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RESEARCH METHODOLOGY

SEMESTER - 3

MASTER OF COMMERCE



KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

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MASTER OF COMMERCE

RESEARCH METHODOLOGY

DETAILED SYLLABUS

UNIT 1: Introduction to Research **Page No. : 9 – 24**

Meaning of research;Types of research- Exploratory research, Conclusive research; The process of research, Research applications in social and business sciences; Features of a Good Research Study

UNIT 2: Research Design **Page No. : 25 – 44**

Meaning of Research Designs; Nature and Classification of Research Designs , Exploratory Research , Descriptive Research Designs, Experimental Designs and Errors affecting Research Design

UNIT 3: Reviewing the Literature **Page No. : 45 – 56**

Defining Secondary Data,Definition and Purpose of literature Review, Types of Literature Review,Process of Literature Review and examples of Literature Review

UNIT 4: Research Problem and Formulation of Research Hypothesis **Page No. : 57 – 74**

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UNIT 5: Primary and Secondary Data **Page No. : 75 – 94**

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UNIT 6: Measurement and Scaling **Page No. : 95 – 116**

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UNIT 9: Data Processing **Page No. : 167 – 178**

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UNIT 10: Univariate and Bivariate Analysis of Data **Page No. : 179 – 193**

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UNIT 11: Testing of Hypotheses **Page No. : 194 – 210**

Concepts in Testing of Hypothesis, Steps in testing of hypothesis, Applications of Hypothesis Testing,test of Single Mean (Large Sample),Test of Single Mean (Small Sample), Test of Difference between Means (Large Sample), Test of Difference between Means (Small Sample), Test of Single Population (Large Sample) and tests for Difference between Two Population Proportions

UNIT 12: Chi square Analysis **Page No. : 211 – 219**

Chi square test, Chi square test for the Goodness of Fit, Chi square test for the independence of variables , Chi square test for the equality of more than two population proportions

UNIT 13: Analysis of Variance **Page No. : 220 – 231**

Introduction of Analysis of Variance, One-way ANOVA, Two-way ANOVA, Design of Experiments, Principles of Design of Experiments, Completely Randomized Design (CRD), Randomized Block Design (RBD) and Factorial Design

UNIT 14: Research Report Writing **Page No. : 232 – 244**

Meaning and Significance of Report Writing, Types of research reports , Structure of the research report,Report writing: Formulation rules for writing the report,Guidelines for presenting tabular data and guidelines for visual Representations

UNIT 15: Ethics in Research **Page No. : 245 – 254**

Meaning of Research Ethics,Clients Ethical code,, Researchers Ethical code,Ethical Codes related to respondents and Responsibility of ethics in research

COURSE INTRODUCTION

This is the eleventh course of M.Com Programme. This course “Research Methodology” offered in M.Com 3rd semester will focus on the different aspects of research methodology. Research is all pervasive key for decision making in any organisation.Hence, it is important to have “Research Methodology” as a subject. In this course , the subject matter of the business research is included at large and also at a micro level.This course aims at covering various aspects of Research such as problem formulation , data gathering, analysing , interpretation of data, report writing etc.

This course consists of fifteen units. This course starts with the unit discussing the concept of the introduction to research methodology and deals with other aspects of research namely research design, literature review, Research problem and formulation of research, primary and secondary data, measurement and scaling, sampling, Questionnaire, Data Processing and analysis, univariate and bivariate analysis of data, testing of hypothesis, chi square analysis , analysis of variance and research report writing and ethics in research.

Each unit of this course includes some along-side boxes to help you know some of the difficult, unseen terms. Some “EXERCISES” have been included to help you apply your own thoughts. You may find some boxes marked with: “LET US KNOW”. These boxes will provide you with some additional interesting and relevant information. Again, you will get “CHECK YOUR PROGRESS” questions. These have been designed to self-check your progress of study. It will be helpful for you if you solve the problems put in these boxes immediately after you go through the sections of the units and then match your answers with “ANSWERS TO CHECK YOUR PROGRESS” given at the end of each unit. you in making your learning more active and efficient. And, at the end of each section, you will get “CHECK YOUR PROGRESS” questions. These have been designed to self-check

UNIT 1: INTRODUCTION TO RESEARCH

UNIT STRUCTURE

1.1 Learning Objectives

1.2 Introduction

1.3 Meaning and Concept of Research in Business

1.4 Types of Research Design : Exploratory and Conclusive Research

1.5 Process of Research

1.6 Features of good research study

1.7 Case Studies: Research Applications in Business

1.8 Let Us Sum Up

1.9 Further Reading

1.10 Answers to Check your progress

1.11 Model Questions

1.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- discuss the meaning and concept of Research
- outline the different types of research – Exploratory and Conclusive Research
- describe the process of research
- discuss research applications in business sciences
- describe the features of a good research study

1.2 INTRODUCTION

Research is one of the most important and fascinating aspects of business. In this unit, a formal definition of business research is given and classifies business research into two areas: problem identification and problem-solving research. We describe the business research process and the six steps that are involved in conducting research, and discuss the nature of business research, emphasizing its role of providing information for

marketing decision making. The demand for well-executed business research leads to many exciting career opportunities that are described.

Let us now discuss the various concepts of reserach in business n the following sections.

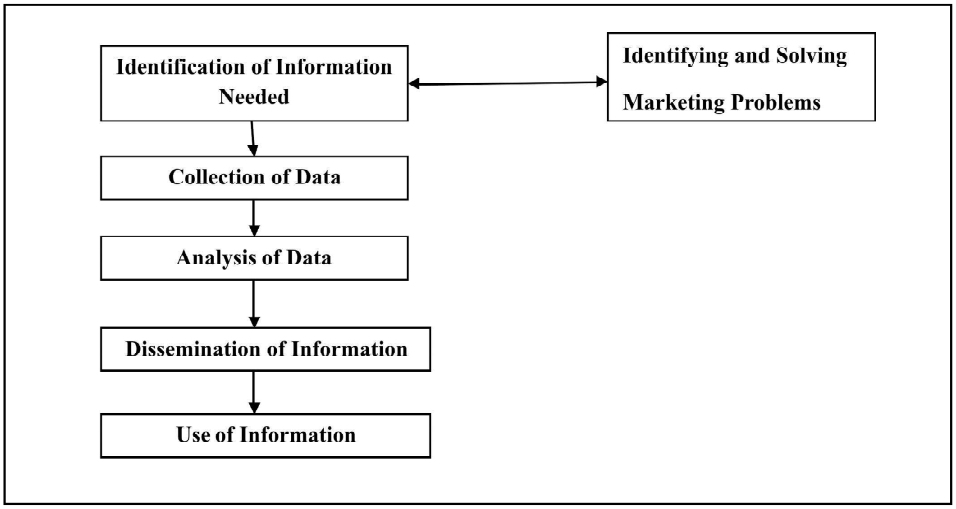
1.3 MEANING AND CONCEPT OF RESEARCH IN BUSINESS

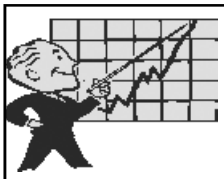
In this unit, we emphasize the need for information for decision making and therefore define business research as follows:

Business Research is the systematic and objective identification, collection, analysis, dissemination, and use of information for the purpose of improving decision making related to the identification and solution of problems and opportunities in marketing. Several aspects of this definition are noteworthy. First, business research is systematic. Thus, systematic planning is required at all stages of the business research process. The procedures followed at each stage are methodologically sound; well documented; and, as much as possible, planned in advance. Business research uses the scientific method in that data are collected and analyzed to test prior thinking that may be formulated into specific hypotheses. Business research attempts to provide accurate information that reflects a true state of affairs. It is objective and should be conducted impartially. Although research is always influenced by the researcher's philosophy, it should be free from the personal or political biases of the researcher or management. The motto of every researcher should be, "Find it and tell it like it is."

Business research involves the identification of informtion, collection of data, analysis of data, dissemination of Information, and use of information, as described in Figure below. Each phase of this process is important. We identify or define the business research problem or opportunity and then determine what information is needed to investigate it. Because every marketing opportunity translates into a research problem to be investigated, we use the terms *problem* and *opportunity* interchangeably. Next, the relevant information sources are identified and a range of data collection methods varying in sophistication and complexity are evaluated

for their usefulness. The data are collected using the most appropriate method; they are analyzed and interpreted, and inferences are drawn. Finally, the findings, implications, and recommendations are provided in a format that enables the managers to use the information for marketing decision making and to take appropriate actions.





CHECK YOUR PROGRESS

Q.1: Define Business Research.

Q.2: Draw the different phases involved in Business research.

1.4 TYPES OF RESEARCH DESIGN : EXPLORATORY & CONCLUSIVE RESEARCH

Research designs are of two broad types: exploratory and conclusive. Conclusive designs are either descriptive or causal. Exploratory, descriptive, and causal are the basic research designs we examine in this unit. Descriptive designs can be further categorized as either cross sectional or longitudinal.

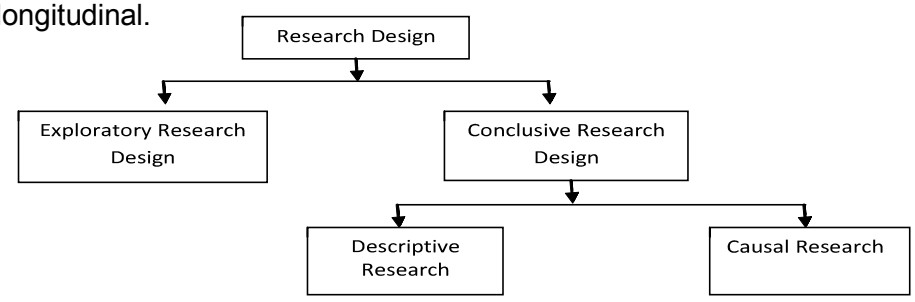


Fig:1.1 Types of Research Design

A) Exploratory Research:

The primary objective of **exploratory research** is to provide insights into, and an understanding of, the problem confronting the researcher. Exploratory research is used in cases when you must define, identify relevant courses of action, or gain additional insights before an approach can be developed. The information needed is only loosely defined at this stage, and the research process that is adopted is flexible and unstructured. For example, it may consist of personal interviews with a few industry experts. The sample, selected to generate maximum insights, is small and non representative. The primary data are qualitative in nature and are analyzed accordingly. Given these characteristics of the research process, the findings of exploratory research should be regarded as tentative. Typically, such research is followed by further exploratory or conclusive research. Thus, it is a good idea to begin a business research project by first conducting exploratory research and then some form of conclusive research. Sometimes, exploratory research is all the research that is conducted. In these cases, caution should be exercised in utilizing the findings. Secondary data including social media (discussed later in this chapter) and qualitative research (discussed in Unit IV) are the main methods of exploratory research.

The insights gained from exploratory research might be verified by conclusive research because the objective of conclusive research is to test specific hypotheses and examine specific relationships. This requires that the information needed is clearly specified. **Conclusive research** is typically more formal and structured than exploratory research. It is based on large, representative samples, and the data obtained are subjected to quantitative analysis. The findings from this research are considered to be conclusive in nature in that they are used as input into managerial decision making. Conclusive research designs may be either descriptive or causal.

B) Descriptive Research:

As the name implies, the major objective of **descriptive research** is to describe something— usually the characteristics of relevant groups, such as consumers, salespeople, organizations, or market areas. For example, we could develop a profile of the “heavy users” (frequent shoppers)

of prestigious department stores like Pantaloons and Big Bazaars. A vast majority of business research studies involve descriptive research, which makes use of surveys and observations as major methods. **Surveys** involve questioning of respondents by administering a questionnaire. **Observations** involve recording people's behaviour without asking them questions. Descriptive research can be further classified into cross-sectional and longitudinal research.

C) Causal Research:

Causal research is used to obtain evidence of cause-and-effect (causal) relationships. Marketing Managers continually make decisions based on assumed causal relationships. These assumptions may not be justifiable, and the validity of the causal relationships should be examined via formal research. For example, the common assumption that a decrease in price will lead to increased sales and market share does not hold in certain competitive environments. Like descriptive research, causal research requires a planned and structured design. While descriptive research can determine the degree of association or correlation between variables (i.e., the two variables vary together or are related), it is not appropriate for examining causal relationships (i.e., one variable is a cause of the other variable). Such an examination requires a causal design. The main method of causal research is experimentation, which is discussed further in Unit II.

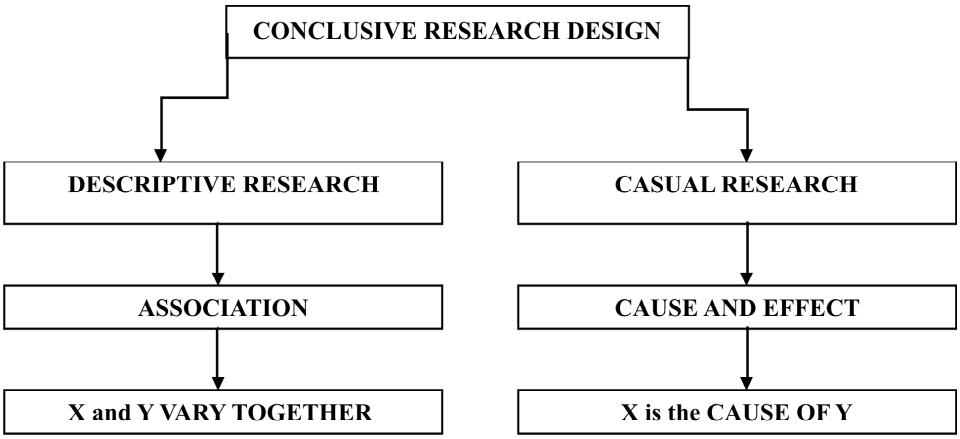


Fig 1.2: Types of Conclusive Reserach Design



CHECK YOUR PROGRESS

Q.3: Define Exploratory Research and Conclusive Research

Q.4: Name the two types of Conclusive Research

1.5 THE PROCESS OF RESEARCH

We conceptualize the **business research process** as consisting of six steps (Figure below): defining the problem, developing an approach to the problem, formulating a research design, doing field work or collecting data, preparing and analyzing data, and preparing and presenting the report. Each of these steps is discussed in great detail in the subsequent chapters; thus, the discussion here is brief.

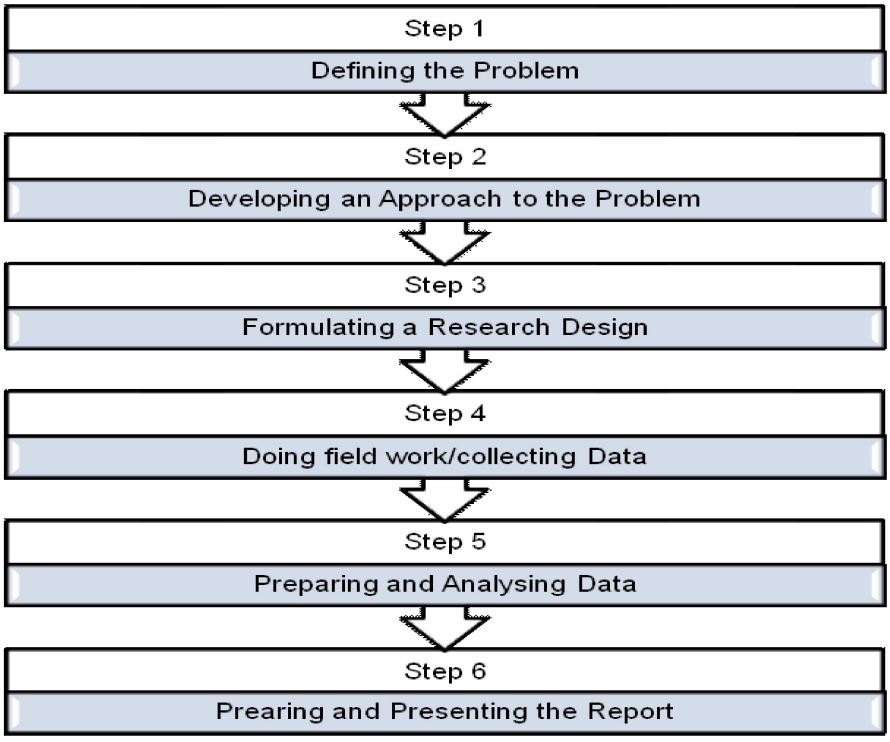


Fig 1.3:Research Process

Let us now discuss the steps in following ways:

Step 1: Defining the Problem: The first step in any business research project is to define the problem. In defining the problem, the researcher should take into account the purpose of the study, the relevant background

information, the information needed, and how it will be used by managers in making decisions. Once the problem has been defined precisely, the research can be designed and conducted properly.

Step 2: Developing an Approach to the Problem: Development of an approach to the problem involves a broad determination of how the problem will be addressed without going into the details. It consists of formulating an analytical framework and models, and research questions and hypotheses, and identifying the information needed.

Step 3: Formulating a Research Design: A research design gives details of the procedures that must be implemented for obtaining the required information. Its purpose is to design a study that will test the hypotheses of interest, determine possible answers to the research questions, and provide the information needed by managers for making decisions. Determining the type of research to be conducted, defining the variables precisely, and designing appropriate scales to measure them are also part of the research design. The issue of how the data should be obtained from the respondents (for example, by conducting a survey or an experiment) must be addressed. It is also necessary to design a questionnaire. The researcher has to develop a sampling plan that specifies how to select respondents for the study and must prepare a preliminary plan of data analysis.

Step 4: Doing Field Work or Collecting Data: Field work, or data collection, involves a field force or staff that operates either in the field, as in the case of personal interviewing, or from an office by telephone, through mail, or electronically as in the case of e-mail and Internet surveys. Proper selection, training, supervision, and evaluation of the field force help minimize data collection errors.

Step 5: Preparing and Analyzing Data: Data preparation involves adequately preparing the data for analysis. Each questionnaire or observation form is inspected or edited and, if necessary, corrected for any errors. Number or letter codes are assigned to represent each response to each question in the questionnaire; this procedure is called coding. The data from the questionnaires are transcribed or keyed onto disks or storage devices, or input directly into the computer. The data are then analyzed to

derive information related to the components of the business research problem and thus to provide input into management decision making.

Step 6: Preparing and Presenting the Report: The entire project should be documented in a written report that addresses the research questions; describes the approach, the research design, data collection, and data analysis procedures; and presents the results and the major findings. The findings should be presented in a comprehensible format so that management can readily use them in the decision-making process. In addition, an oral presentation should be made to management using tables, figures, and graphs to enhance clarity and impact.

Although we have described the research process as a sequence of steps, it should be noted that these steps are interdependent and iterative (above figure). Thus, at each step, the researcher should not only look back at the previous steps but also look ahead to the following steps. Our description of the business research process is fairly typical of the research being done by major corporations such as Apple, in the introductory Research in Practice example discussed at the end of this unit.



CHECK YOUR PROGRESS

Q.5: Write the different steps involved in the Business Research Process

1.6 FEATURES OF A GOOD RESEARCH STUDY

Research in simplified terms means searching for the facts searching for the replies to the various queries and also for the solutions to the various problems.When we talk about good reserch study, we should take care of the following:

1. Research should be systematic in nature.
2. It should be logical.
3. It should be empirical and replicable in nature.

4. It should be according to plans.

5. It should be according to the rules and the assumptions should not be based on the false bases or judgments.

6. It should be relevant to what is required.

The following are the features of a reserach study:

(i) Defining the Business research Problem and Developing an Approach: The simplest way to find out when a company needs help is when it has to make a decision. Any time there is a go or no/go, a yes or no, or a decision to be made, the company can ask what information can help reduce the risk associated with the decision. It would then talk with to develop the information that might help to reduce that risk. The first step is to define the business research problem, and a lot of discovery takes place at this stage. The account executive (AE) will sit down with a client and try to determine whether what the client believes is the problem really is the problem, or whether it needs to change or broaden the scope of the problem. Discussions with the key decision makers (DMs) might reveal that the company has been focusing on too narrow an issue or that it has been focusing on the wrong problem altogether.

The researcher must believe that defining the business research problem is critical to a successful research project. The company finds out what the symptoms are and works with the client to identify the underlying causes. Considerable effort is devoted to examining the background or the environmental context of the problem. In at least half the cases, when they go through the process of exploring the problem, the problem will change. It will gain a new scope or direction. This process results in a precise definition of the business research problem, including an identification of its specific components.

Once the problem has been defined, the researcher develops a suitable approach. The problem definition is refined to generate more specific research questions and sometimes hypotheses. Based on its experience, the researcher would develop a variety of analytical models that are customized to the identified problem. This process also results in the identification of information that will help the client company solve its problem.

(ii) Research Design Formulation: In formulating the research design, the researcher should place special emphasis on qualitative research, survey methods, questionnaire design, and sampling design.

a. Qualitative Research. One of the pitfalls that the researcher encounters comes with qualitative research. Qualitative research is nice because it is immediate. The information generated tends to be extremely rich and in the customers' words. He would get to see what kinds of answers are being given and what kinds of questions and concerns customers or potential customers might have. However, one of the dangers is thinking that all customers or potential customers might view products or service offerings in the same manner, that is, generalizing the findings of qualitative research to the larger population.

b. Survey Methods. The researcher can use a variety of methods including telephone, mall intercept, mail, and Internet or Web-based surveys. He should carefully select the method that is best suited to the problem. If the researcher is trying to interview customers around the globe, it sends an e-mail invitation to respondents to complete the survey via the Web. Currently, Internet surveys are the most popular across the business research industry in.

c. Questionnaire Design. In designing the questionnaire, the researcher should pay particular attention to the content and wording of the questions. Some questions are well-defined and can be easily framed; for other issues, the exact questions to ask might not be clear. The simpler the question and the more clear it is who the target respondents are, the better the information generated.

d. Sampling Design. The researcher can have a sampling department that consults with the senior account management team and account executives to determine the proper sample to use. The sampling frame is defined in terms of who the respondents are and who can answer the questions that need to be addressed. The target population is defined by the business research problem and the research questions. He should be concerned about using a representative sample so that the results can

be generalized to the target population (e.g., all the target consumers as opposed to only the consumers included in the sample).

(iii) Data Collection and Analysis: Once the information has been collected, it will reside either in a computer-related format or a paper format that is entered into a computer format. The results are tabulated and analyzed via computers. Through the "Digital Dashboard" product, the researcher should not only have the ability to disseminate the results to clients when the project is finished, but also to show them the data as it is being collected. The researcher breaks down the data analysis by relevant groups. You might see information by total respondents, and you might see information broken out by gender or business size. Essentially, he looks at different breaks in the data to try to understand what is happening, if there are differences based on different criteria, and, if so, how to make decisions based on that information.

(iv) Report Preparation and Presentation: Clients need information much faster than they have in the past because decisions need to be made much more quickly. Organizing large meetings to present data analysis results is not practical in many situations. The report documents the entire research process. It discusses the management decision problem, the business research problem, the approach and research design, the information obtained to help management make the decision, and the recommendations.

The report-writing process starts from the first conversation with the client, and it is written as the research proceeds, not simply when the project is almost done. The report focuses on improving management's decision making. The researcher's goal is to help clients have better decision-making abilities so that the clients are more valuable to their respective companies. He should emphasize this focus by reminding its clients, "Here are the management decision and business research problems we agreed upon. Here's the information we gathered. Here's the decision it points to." The researcher should believe that a successful research project often leads to a subsequent research project; the research process is more of a circular process. It does not typically have a finite beginning and end. Once you solve a problem there is always another one to work on.



CHECK YOUR PROGRESS

Q.6: What are the features of a good research study?

1.7 CASE STUDIES: RESEARCH APPLICATION IN BUSINESS

(i) Case Study of Apple : Combining Marketing Research and Technological Innovation

Apple launched the iPad in 2010 and sold 300,000 of the tablets on the first day, 1 million iPads in twenty-eight days—less than half of the seventy-four days it took to sell 1 million iPhones. Consumers watched more than 30 billion videos online in one month. As in the case of other innovative products it had introduced in the past (iPod, iTunes Music Store, iPhone), marketing research played a significant role in the design and successful introduction of the iPad. Business research in the form of focus groups (interviews with a small group of consumers), analysis of social media, and surveys indicated that in this electronic age of multitasking, consumers were looking for electronic devices that integrate numerous functions on one platform. Consumers were also looking for a device that filled the gap between smart phones and laptops. The iPad was designed to meet this need and succeeded in creating a new mobile device category on its own. With over 15 million iPads sold in its first nine months of availability, the late Apple CEO Steve Jobs said 2010 was “The Year of the iPad.” Capitalizing on this great success, Apple launched the iPad2 in March 2011. The company launched a new version of the iPad on March 16, 2012 and sold more than 3 million units in four days, making this the most successful launch yet for Apple’s tablet. On September 12, 2012, Apple unveiled a new thinner iPhone 5 and pre-orders sold out in less than an hour. The iPhone 5 set a new sales record as customers placed more than 2 million pre-orders for the iPhone 5 on the first day it was available, doubling previous results and exceeding initial supply of the smart phone.

Apple undertakes extensive research to identify marketing opportunities and also to develop products and marketing programs to exploit those opportunities. While, it maintains an in-house staff of marketing researchers, the company relies heavily on external marketing research suppliers. All the information generated by marketing research becomes a part of Apple's decision support system. Despite the passing away of Steve Jobs on October 5, 2011, consumers can expect the stream of innovative new products from Apple to continue given the company's continued reliance on marketing research and technological innovation. In fact, during 2013 and 2014, Apple was expected to launch many new innovative products including the highly anticipated Apple television that has been developed based on extensive marketing research.

This example illustrates the crucial role played by business research in designing and implementing successful marketing programs. It illustrates only a few of the methods used to conduct business research: focus groups, analysis of social media, and surveys. This course will introduce all types of business research techniques and illustrate their applications in designing effective marketing strategies. The role of business research can be better understood through its definition.

(ii) Case Study of McDonald's : Adapting to Local Culture with its Global Image

In markets across the globe, McDonald's respects local cultures and has adopted its menu and dining experience to local preferences. Business research showed that, in India, food consumption was influenced by people's religious beliefs. Accordingly, McDonald's dropped beef and pork from its menus, conforming to the religious beliefs of Hindus and Muslims, who make up most of India's population. Instead, it has numerous vegetarian versions of some of its American classics, like the McVeggie burger and McSpicy Paneer, as well as chicken offerings. On the value menu, the McAloo Tikki burger, made from a potato-based patty, is a top seller, accounting for as much as 25 percent of the restaurants' total sales in India.

Marketing research also revealed that vegetarians in India are strict in observing food habits and practices. Therefore, McDonald's kitchens in

this country are divided into separate sections for cooking vegetarian and non vegetarian food. In September 2012, the fast-food giant announced that the new restaurants in some pilgrimage areas in India will be vegetarian only to cater to the preferences of the local customer base. In part, McDonald's success globally has been attributed to its ability to adapt to local culture and preferences while retaining its global brand image, which is made possible by its reliance on business research.



1.8 LET US SUM UP

In this unit we ahve discussed the following:

- **Business Research** is the systematic and objective identification, collection, analysis, dissemination, and use of information for the purpose of improving decision making related to the identification and solution of problems and opportunities in marketing.
- Business research involves the identification, collection, analysis, dissemination, and use of information.
- Research designs are of two broad types: exploratory and conclusive.
- Conclusive designs are either descriptive or causal.
- Exploratory, descriptive, and causal are the basic research designs.
- Exploratory research is used in cases when you must define, identify relevant courses of action, or gain additional insights before an approach can be developed.
- **Descriptive research** is to describe something— usually the characteristics of relevant groups, such as consumers, salespeople, organizations, or market areas.
- **Causal research** is used to obtain evidence of cause-and-effect (causal) relationships.
- **Business research process** as consisting of six steps namely: defining the problem, developing an approach to the problem, formulating a research design, doing field work or collecting data, preparing and analyzing data, and preparing and presenting the report.
- Some of the features of a reserach study are:

(i) Defining the Business research Problem and Developing an Approach

(ii) Research Design Formulation

(iii) Data Collection and Analysis

(iv) Report Preparation and Presentation:



1.9 FURTHER READING

1. Malhotra, N.K. and Dash, S. (2011); *Marketing research: An Applied Orientation* (6th edition); New Delhi: Pearson Education.



1.10 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q1: Buisness research is the systematic and objective identification, collection, analysis, dissemination, and use of information for the purpose of improving decision making related to the identification and solution of problems and opportunities in marketing.

Ans to Q2: Business research involves differnt phases , they are ; the identification of informtion, collection of data, analysis of data, dissemination of Information, and use of information.

Ans to Q3. The primary objective of **exploratory research i**s to provide insights into, and an understanding of, the problem confronting the researcher.

Conclusive research is formal and structured than exploratory research. It is based on large, representative samples, and the data obtained are subjected to quantitative analysis.

Ans to Q4. The two types of conclusive research are : **Descriptive Research** and **Causal Research**

Ans to Q5. Business research process as consisting of six steps.They are- defining the problem, developing an approach to the

problem, formulating a research design, doing field work or collecting data, preparing and analyzing data, and preparing and presenting the report

Ans to Q6. (i) Defining the Business research Problem and Developing an Approach.

(ii) Research Design Formulation.

(iii) Data Collection and Analysis

(iv) Report Preparation and Presentation



1.11 MODEL QUESTIONS

Q.1: Describe the task of business research.

Q.2: What decisions are made by marketing managers? How does business research help in making these decisions?

Q.3: Define business research.

Q.4: What are the different methods of conducting business research?

Q.5: What are some of the issues that should be considered when conducting business research?

Q.6: Why do organizations conduct business research?

Q.7: What are some of the reasons for the increased need for business research?

Q.8: Discuss the different types of Business research Designs?

Q.9: Explain in details the different steps involved in the Business research Process.

Q.10: What are the features of a good research study?

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UNIT 2: RESEARCH DESIGN

UNIT STRUCTURE

2.1 Learning Objectives

2.2 Introduction

2.3 Meaning of Research Design

2.4 Types of Reserach Design

2.5 Exploratory Research

2.6 Conclusive Research

2.6.1 Descriptive Reserach Design

2.6.2 Causal Research Design

2.7 Experimental Designs

2.8 Errors affecting Research Design

2.9 Case Studies on Reserach Design

2.10 Let Us Sum Up

2.11 Further Reading

2.12 Answers to Check your progress

2.13 Model Questions

2.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- discuss the meaning and concept of Research Design
- outline the nature and classification of research designs – Exploratory and Conclusive Research
- describe the different types of exploratory research designs
- describe the different types of descriptive research designs
- describe experimental designs
- describe the errors affecting research design

2.2 INTRODUCTION

This is the second unit of the block and it describes the concepts of reserch design in detail.Having discussed the concept of business research

let us now have some idea on reserach design.A research design is the specification of methods and procedures for acquiring the information needed.In the following sections we are going to learn about the various types of research design.

2.3 MEANING OF RESEARCH DESIGN

A **research design** is a framework or blueprint for conducting the marketing research project. It gives details of the procedures necessary for obtaining the information needed to identify or solve marketing research problems. Although a broad approach to the problem has already been discussed in the previous Unit I, the research design specifies the details of implementing that approach. The design process begins by defining the business research problem (Step 1 of the business research process). Next comes the approach to the problem consisting of a framework and models, research questions and hypotheses, and the information needed (Step 2 of the business research process). The research design is based on the results of these first two steps and in the third step of the marketing research process. Yet the process is iterative, with feedback from research design to the earlier steps. A research design lays the foundation for conducting the project. Many different designs might be appropriate for a given marketing research problem. A good research design ensures that the information collected will be relevant and useful to the management and that all of the necessary information will be obtained. Typically, a research design involves the following components or tasks:

1. Analysis of secondary and syndicated data
2. Qualitative research
3. Survey and observation research
4. Experimental research
5. Measurement and scaling procedures
6. Design and pretest of a questionnaire (interviewing form) or an observation form for data Collection.
7. Sampling process and sample size determination
8. Development of a preliminary plan of data analysis.

Steps Leading to the Formulation of a Research Design

Step 1: Defining the Business Research Problem

Step 2: Developing an Approach to the Problem

Step 3: Formulating the Research Design

Depending on the nature of the research project, not all of the eight tasks may be involved, and the order or the sequence in which these tasks are performed could also vary. Each of these components will be discussed in great detail in the subsequent chapters. First, we must further our understanding of research design with a classification of the basic types.



CHECK YOUR PROGRESS

Q.1: Define Research Design.

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Q.2: What are the different steps involved in formulating a research Design

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2.4 TYPES OF RESEARCH DESIGN

Reserach designs have been classified by various authors in different ways.Different types of reserch designs have emerged on account of the differnt perspective from which a research study can be viewed. Research designs are of two broad types: exploratory and conclusive. Conclusive designs are either descriptive or causal. Exploratory, descriptive, and causal are the basic research designs we examine in this unit (see Figure 2.1). Descriptive designs can be further categorized as either cross sectional or longitudinal.

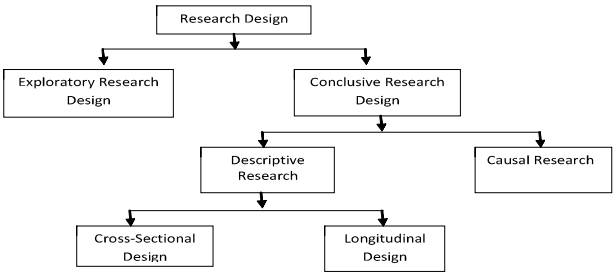


Fig 2.1 Classification of Marketing Research

Let us discuss the various types of research designs in the following sections:

2.5 EXPLORATORY RESEARCH

The primary objective of exploratory research is to provide insights into, and an understanding of, the problem confronting the researcher. Exploratory research is used in cases when you must define the problem more precisely, identify relevant courses of action, or gain additional insights before an approach can be developed. The information needed is only loosely defined at this stage, and the research process that is adopted is flexible and unstructured. For example, it may consist of personal interviews with a few industry experts. The sample, selected to generate maximum insights, is small and non representative. The primary data are qualitative in nature and are analyzed accordingly. Given these characteristics of the research process, the findings of exploratory research should be regarded as tentative. Typically, such research is followed by further exploratory or conclusive research. Thus, it is a good idea to begin a marketing research project by first conducting exploratory research and then some form of conclusive research. Sometimes, exploratory research is all the research that is conducted. In these cases, caution should be exercised in utilizing the findings. Secondary data including social media (discussed later) and qualitative research are the main methods of exploratory research.

The insights gained from exploratory research might be verified by conclusive research because the objective of conclusive research is to test specific hypotheses and examine specific relationships. This requires that the information needed is clearly specified.

The following are some of the methods of explorarotry reserach designs:

i) **Secondary Resource Analysis :** The information that researchers obtain from decision makers and industry experts should be supplemented with available secondary data. **Secondary data** are data collected for some purpose other than the problem at hand, such as data available from trade organizations, the Census Bureau (www.census.gov), and the Internet. In contrast, **primary data** are originated by the researcher for the specific problem under study, such as survey data. Secondary data include information made available by business and government sources, social media and computerized databases. Secondary data are an economical and quick source of background information. Analyzing available secondary data is an essential step in the problem-definition process and should always precede primary data collection. Secondary data can provide valuable insights into the problem situation and lead to the identification of innovative courses of action. In the case of Harley-Davidson, secondary data revealed that the vast majority of motorcycle owners also owned automobiles such as cars, SUVs, and trucks. As another example, the Department of Labor says that the median age of the Indian Labor force is increasing. This is, in part, the result of the maturation of the “baby bust” generation (those born between 1965 and 1976), which will cause a decline in the number of young (age 16 to 24) workers available to fill entry-level positions. This potential shortage of young workers has caused many marketers, particularly those in the service industries, to investigate the problem of consumer response to self-service. Some companies, such as fast-food restaurants, have switched from a high-touch to a high-tech service orientation. By using high-tech equipment, consumers now perform many of the services formerly done by workers, such as placing their own orders by entering them directly into the electronic terminal. Given the tremendous importance of secondary data, this topic will be discussed in detail in Unit 4.

(ii) **Case Study Method :** Case Studies involve an intensive examination of a few selected cases of the phenomenon of interest. The cases should be consumers, stores, firms or a variety of other units such as markets, Web sites and so on. The data are obtained from the company, external secondary sources and by conducting lengthy unstructured interviews with people knowledge about the phenomenon of interest. In a department store project, valuable insights into factors affecting store patronage were obtained in a case study comparing the five best stores with the five worst stores.

(iii) **Expert Opinion Survey :** Interviews with industry experts and individuals, knowledgeable about the firm and the industry may help formulate the marketing research problem. These experts may be found both inside and outside the firm. Typically, expert information is obtained by unstructured personal interviews, without administering a formal questionnaire. It is helpful, however, to prepare a list of topics to be covered during the interview. The order in which these topics are covered and the questions to ask should not be predetermined but decided as the interview progresses. This allows greater flexibility in capturing the insights of the experts. The purpose of interviewing experts is to help define the marketing research problem rather than to develop a conclusive solution. In the Harley-Davidson Case Study, discussions with industry experts indicated that brand loyalty was a major factor in the purchase of motorcycles. Thus, the investigation of brand loyalty became a major component of the problem definition.

Interviews with experts are more useful in conducting marketing research for industrial firms and for products of a technical nature, where it is relatively easy to identify and approach the experts. This method is also helpful in situations where little information is available from other sources, as in the case of radically new products.

Researchers can also use the Internet to enhance their ability to obtain information from experts in a specific industry. One approach to finding experts is to use newsgroups. Due to the large amount of information

available, searching through the newsgroups for specific information can be an arduous task. A good place to start is Google Groups (groups.google.com), which provides categorized lists of newsgroups. After finding a relevant newsgroup, access the newsgroup and search for postings about the topics in which you are interested. Surveying the postings in a newsgroup would provide a good starting point for making contacts with the experts in that industry.

(iv) **Focus Group Discussions:** A **focus group** is an interview conducted by a trained moderator in an unstructured and natural manner with a small group of respondents. The moderator leads the discussion. The main purpose of focus groups is to gain insights by listening to a group of people from the appropriate target market talk about issues of interest to the researcher. The value of the technique lies in the unexpected findings often obtained from a free-flowing group discussion. Focus groups are the most important qualitative research procedure. They are so popular that many marketing research practitioners consider this technique synonymous with qualitative research. Given their importance and popularity, we describe the salient characteristics of focus groups in detail.

The differences between exploratory and conclusive research are summarized in Table 2.1.

2.6 CONCLUSIVE RESEARCH

Conclusive research is typically more formal and structured than exploratory research. It is based on large, representative samples, and the data obtained are subjected to quantitative analysis. The findings from this research are considered to be conclusive in nature in that they are used as inputs into managerial decision making.As shown in Figure 2.1, conclusive research designs may be either descriptive or causal.Before going into the concept of descriptive and causal research design in deatil, let us first discuss about the difference between Exploratory and Conclusive Research.

Table 2.1 Difference between Exploratory and Conclusive Research

	Exploratory	Conclusive
Objective	To provide insights and understanding	To test specific hypothesis and examine relationship
Characteristics	Information needed is defined only loosely Research process is flexible and unstructured Sample is small and non representative	Information needed is clearly defined Research process is formal and structured Sample is large and representative
Findings Outcome	Data analysis is qualitative Tentative Generally followed by further exploratory or conclusive research	Data analysis is quantitative Conclusive Findings used as input into decision making

2.6.1 Descriptive Research

As the name implies, the major objective of **descriptive research** is to describe something— usually the characteristics of relevant groups, such as consumers, salespeople, organizations, or market areas. For example, we could develop a profile of the "heavy users" (frequent shoppers) of prestigious department stores like Pantaloons and Big Bazaars. A vast majority of marketing research studies involve descriptive research, which makes use of surveys and observations as major methods. **Surveys** involve questioning of respondents by administering a questionnaire. **Observations** involve recording people's behaviour without asking them questions. Descriptive research can be further classified into cross-sectional and longitudinal research (Figure 2.1).

a. Cross-sectional designs: It involve the collection of information from any given sample of population elements only once. For example, a survey may be conducted at a given point in time, the data are analyzed, and a report is prepared. The cross-sectional study is the most frequently used descriptive design in marketing research.

b. Longitudinal designs: In longitudinal designs, a fixed sample of population elements is measured repeatedly (two or more times) on the same variables. A longitudinal design differs from a cross-sectional design in that the sample remains the same over time. In other words, the same people are studied over time and the same

variables are measured. In contrast to the typical cross-sectional design, which gives a snapshot of the variables of interest at a single point in time, a longitudinal study provides a series of pictures that give the changes that take place over time. Thus, a longitudinal design enables us to examine changes over time.

For example, the question, "How did the Indian people rate the Indian Economy at the beginning of 2014?" would be addressed using a cross-sectional design. A survey of a representative sample of the Indian population will have to be conducted only at the beginning of 2014. However, a longitudinal design would be used to address the question, "How did the Indian people change their view of the Indian economy during 2014?" A survey of a representative sample of the Indian population will have to be conducted at the beginning of 2014, and the same survey will have to be repeated on the same sample at the end of 2014. Longitudinal designs can be implemented using panels. Sometimes, the term *panel* is used interchangeably with the term longitudinal design. A panel consists of a sample of respondents, generally households that have agreed to provide information at specified intervals over an extended period. Panels are maintained by marketing research firms, and panel members are compensated for their participation with gifts, coupons, information, or cash.

2.6.2 Causal Research

Causal research is used to obtain evidence of cause-and-effect (causal) relationships. Marketing Managers continually make decisions based on assumed causal relationships. These assumptions may not be justifiable, and the validity of the causal relationships should be examined via formal research. For example, the common assumption that a decrease in price will lead to increased sales and market share does not hold in certain competitive environments. Like descriptive research, causal research requires a planned and structured design. While descriptive research can determine the degree of association or correlation between variables

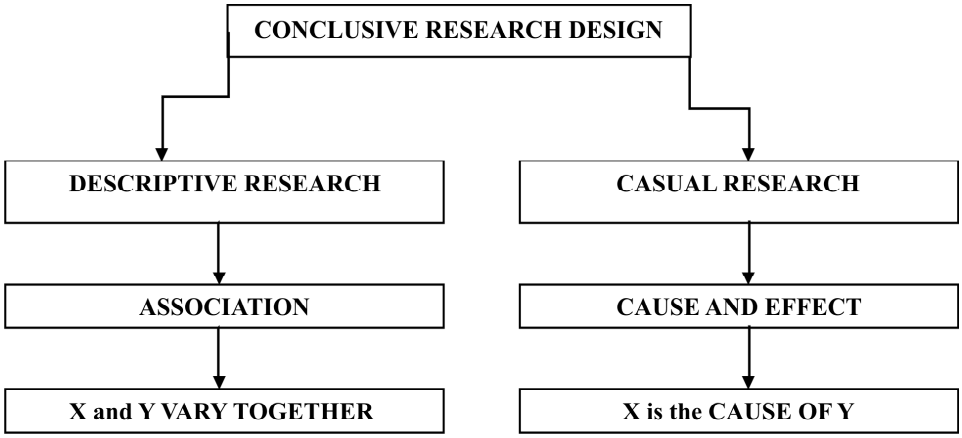


Figure 2.2 Conclusive reserach design



CHECK YOUR PROGRESS

Q.3: Define Exploratory Research and Conclusive Research.

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Q.4: Write the two types of Conclusive Research.

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Q.5: What is a Focus Group Interview?

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2.7 EXPERIMENTAL RESEARCH DESIGN

Experimentation is the research technique used in causal research. It is the primary method for establishing cause-and-effect relationships in marketing. As seen, experiments can be conducted in the field or in the laboratory. A field experiment involves measurement of behavior, attitudes, or perceptions in the environment in which they occur. Thus, field experiments are conducted in natural settings.

On the other hand, a laboratory experiment is conducted is an artificial environment. Advertising testing and test kitchens in central-location theaters are examples of laboratory experiments used in marketing

research. Experiments can be described in terms of independent, dependent, and extraneous variables; test units; and random assignment to experimental and control groups.

Experiment: An is formed when the researcher manipulates one or more independent variables and determines their effect on one or more dependent variables measured on the test units, while controlling for the effect of extraneous variables.

Experimental Design: An experimental design is a set of procedures specifying (1) the test units and how these units are to be divided into homogeneous subsamples, (2) what independent variables or treatments are to be manipulated, (3) what dependent variables are to be measured, and (4) how the extraneous variables are to be controlled.

Classification of Experimental Designs

The three broad categories of experimental designs are pre-experimental, true experimental and statistical design. Pre-experimental designs are characterized by a lack of randomization. In true experimental designs, the researcher can randomly assign subjects and experimental groups. Therefore, these designs provide a larger degree of control over extraneous variables. A statistical design is a series of basic experiments that allows for statistical control and analysis of extraneous variables. Statistical designs are classified on the basis of their characteristics and use.



CHECK YOUR PROGRESS

Q.6: What is an Experiment?

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Q.7: What is an Experimental Design?

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Q. 8: Classify the different Experimental Designs?

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2.8 ERRORS AFFECTING RESEARCH DESIGN

Several potential sources of error can affect a research design. A good research design attempts to control the various sources of error. These errors are discussed below. The **total error** is the variation between the true mean value in the population of the variable of interest and the observed mean value obtained in the marketing research project.

(i) **Random Sampling Error – Random Sampling Error** occurs because the particular sample selected is an imperfect representation of the population of interest. Random Sampling Error is the variation between the true mean value in the population and the true mean value for the original sample.

(ii) **Non Sampling Error - Non Sampling Error** can be attributed to sources other than sampling and they maybe random or nonrandom. The result from a variety of reasons, including errors in problem definition, approach, scales, and questionnaire design interviewing methods and data preparation and analysis. For example, a researcher designs a poor questionnaire, which contains several questions that lead the respondents to give biased answers.

Non Sampling Error consists of Response Error and Non Response Error.

(iii) **Non Response Error – Non Response Error** arises when some of the respondents included in the sample do not respond. The primary cause of non response are refusals and not-at-homes. Non response will cause the net or resulting sample to be different in size or composition from the original sample. Non response error is defined as the variation between the true mean value of the variable in the original sample and the true mean value in the net sample.

(iv) **Response Error – Response Error** arises when respondents give inaccurate answers or their answers are

misrecorded or misanalyzed. Response error is defined as the variation between the true mean value of the variable in the net sample and the observed mean value obtained in the marketing research project. Response errors can be made by ***Researchers, Interviewers or Respondents.*** Errors made by researchers include ***Surrogate Information, Measurement, Population Definition, Sampling Frame and Data Analysis Errors***.

(v) **Surrogate Information Error –** It may be defined as the variation between the information needed for the marketing research problem and the information sought by the researcher. For example, instead of obtaining information on consumer choice of a new brand , the researcher obtains information on consumer preferences since the choice process cannot be easily observed.

(vi) **Measurement Error** maybe defined as variation between the information sought and the information generated by the measurement process employed by the researcher. While seeking to measure consumer preferences, the researcher employs a scale that measures perceptions rather than preferences.

(vii) **Population Definition Error** may be defined as the variation between the actual population relevant to the problem at hand and the population as defined by the researcher.

(viii) **Sampling Frame Error** maybe be defined as the variation between the population defined by the researcher and the population as implied by the sampling frame (list) used. For example, the telephone directory used to generate a list of telephone numbers does not accurately represent the population of total potential consumers because of unlisted, disconnected and new numbers in service.

(ix) **Data Analysis Error** encompasses errors that occur while raw data from questionnaires are transformed into research

findings. For example, an inappropriate statistical procedure is used, resulting in incorrect interpretation and findings.

Response Errors made by interviewers include ***Respondent Selection, Questioning, Recording and Cheating Errors.***

(x) **Respondent Selection Error** occurs when interviewers select respondents other than those specified by the sampling design or in a manner inconsistent with the sampling design. For Example in a Readership survey, a nonreader is selected for the interview but is classified as a reader of the ***India Today*** Magazine in the 15-19 yrs age category in order to meet a difficult quota requirement.

(xi) **Questioning Error** denotes errors made in asking questions of the respondents or in not probing when more information is needed. For example, while asking questions an interviewer does not use the exact wording given in the questionnaire.

(xii) **Recording Error** arises due to errors in hearing, interpreting and recording the answers given by the respondents. For example, a respondent indicates a neutral response (undecided), but the interviewer misinterprets that to mean a positive response (would buy the new brand).

(xiii) **Cheating Error** arises when the interviewer fabricates answers to a part or the entire interview. For example, an interviewer does not ask sensitive questions related to the respondent's debt but later fills in the answers based on personal assessment.

Respondent Errors include ***Inability Errors and Unwillingness Errors.***

(xiv) **Inability Error** results from the respondents' inability to provide inaccurate answers. Respondents may provide inaccurate answers because of unfamiliarity, fatigue, boredom, faulty recall, question format / content, etc. For

example a respondent cannot recall a brand of curd purchased four weeks ago.

(xv) Unwillingness Error arises from the respondent's unwillingness to provide inaccurate information. Respondents may intentionally misreport their answers because of a desire to provide socially acceptable answers , avoid embarrassment or please the interviewer. For example, a respondent intentionally misreports reading *Time* magazine in order to impress the interviewer.

Non Sampling Error is likely to be more problematic than **Sampling Error. Sampling Error** can be calculated, whereas many forms of **Non Sampling Error** defy estimation. Moreover, Non Sampling Error has been found to be the major contributor to Total Error, whereas random sampling error is relatively small in magnitude.



CHECK YOUR PROGRESS

Q9: Define Total Error.

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Q10: Define Non sampling Error.

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2.9 CASE STUDIES ON RESEARCH DESIGNS

A CASE STUDY OF HARLEY DAVIDSON

The motorcycle manufacturer Harley-Davidson (www.harleydavidson.com) made such an important comeback in the early 2000s that there was a long waiting list to get a bike. Harley-Davidson's revenues were $5.58 billion in 2012, and it was the U.S. market leader in the heavyweight category in 2013. Although distributors urged Harley-Davidson to build more motorcycles, the company was skeptical about investing in new production facilities. Past years of declining sales had taught

top management to be more risk-averse than risk-prone. Harley- Davidson was now performing well again, and investing in new facilities meant taking risks. Would the demand follow in the long run or would customers stop wanting Harleys when the next fad came along? The decrease in motorcycles' quality linked to Harley's fast growth had cost the company all its bad years. Top management was afraid that the decision to invest was too early. On the other hand, investing would help Harley-Davidson expand and possibly become the dominant market leader in the heavyweight segment. Discussions with industry experts indicated that brand loyalty was a major factor influencing the sales and repeat sales of motorcycles. Secondary data revealed that the vast majority of motorcycle owners also owned automobiles such as cars, SUVs, and trucks. Focus groups with motorcycle owners further indicated that in the United States, motorcycles were not used primarily as a means of basic transportation but as a means of recreation. The focus groups and social media also highlighted the role of brand loyalty in motorcycle purchase.

Forecasts called for an increase in consumer spending on recreation and entertainment well into the year 2020. Empowered by the Internet and social media, consumers in the twenty-first century had become increasingly sophisticated and value-conscious. Yet brand image and brand loyalty played a significant role in buyer behavior, with well-known brands continuing to command a premium. Clearly, Harley-Davidson had the necessary resources and marketing and technological skills to achieve its objective of being the dominant motorcycle brand on a global basis. This process and the findings that emerged helped define the management decision problem and the marketing research problem. The management decision problem was: Should Harley-Davidson invest to produce more motorcycles? The marketing research problem was to determine if customers would be loyal buyers of Harley-Davidson in the long term. Specifically, the research had to address the following questions:

1. Who are the customers? What are their demographic and psychographic (lifestyle) characteristics?

2. Can different types of customers be distinguished? Is it possible to segment the market in a meaningful way?
3. How do customers feel regarding their Harleys? Are all customers motivated by the same appeal?
4. Are the customers loyal to Harley-Davidson? What is the extent of brand loyalty?

One of the research questions (RQs) examined and its associated hypotheses (Hs) were:

RQ: Can the motorcycle buyers be segmented based on psychographic characteristics?

H1: There are distinct segments of motorcycle buyers.

H2: Each segment is motivated to own a Harley for a different reason.

H3: Brand loyalty is high among Harley-Davidson customers in all segments.

This research was guided by the theory that brand loyalty is the result of positive beliefs, attitude, emotions, and experience with the brand. Both qualitative research and quantitative research were conducted. First, focus groups of current owners, would-be owners, and owners of other brands were conducted to understand their feelings about Harley-Davidson. Then a survey was conducted to get the demographic and psychographic profiles of customers and also their subjective appraisal of Harley.

Some of the major findings follow:

- Seven categories of customers could be distinguished:

(1) the adventure-loving traditionalist,
(2) the sensitive pragmatist,
(3) the stylish status seeker,
(4) the laid-back camper,
(5) the classy capitalist,
(6) the cool-headed loner, and
(7) the cocky misfit. Thus, H1 was supported.

- All customers, however, had the same desire to own a Harley: It was a symbol of independence, freedom, and power. (This uniformity across segments was surprising, contradicting H2.)

| All customers were long-term loyal customers of Harley-Davidson, supporting H3.

Based on these findings, the decision was taken to invest and thus increase the number as well as the quality of Harleys built.

This example shows the importance of correctly defining the marketing research problem and developing an appropriate approach.



2.10 LET US SUM UP

In this unit we discussed the following concepts:

A research design is a framework or blueprint for conducting the marketing research project. It specifies the details of how the project should be conducted. Research designs may be broadly classified as exploratory or conclusive. The primary purpose of exploratory research is to provide insights into the problem. Conclusive research is conducted to test specific hypotheses and examine specific relationships. The findings from conclusive research are used as input into managerial decision making. Conclusive research may be either descriptive or causal.

The major objective of descriptive research is to describe market characteristics or functions. Descriptive research can be further classified into cross-sectional and longitudinal research. Cross sectional designs involve the collection of information from a sample of population elements at a single point in time. In longitudinal designs, repeated measurements are taken on a fixed sample. Causal research is designed for the primary purpose of obtaining evidence about cause-and-effect (causal) relationships.



2.11 FURTHER READING

Malhotra, N.K. and Dash, S. (2011). *Marketing research: An Applied Orientation* (6th edition), New Delhi: Pearson Education.



2.12 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q1: A research design is a framework or blueprint for conducting the a research project. It gives details of the procedures necessary for obtaining the information needed to identify or solve marketing research problems.

Ans to Q2: The Steps that leads to the Formulation of a Research Design

Step 1: Defining the Business Research Problem

Step 2: Developing an Approach to the Problem

Step 3: Formulating the Research Design

Ans to Q3: **Exploratory research** is to provide insights into, and an understanding of, the problem confronting the researcher. **Conclusive research** is typically more formal and structured than exploratory research. It is based on large, representative samples, and the data obtained are subjected to quantitative analysis.

Ans to Q4: Conclusive research designs are classified as descriptive or causal.

Ans to Q5: A **focus group** is an interview conducted by a trained moderator in an unstructured and natural manner with a small group of respondents. The moderator leads the discussion. The main purpose of focus groups is to gain insights by listening to a group of people from the appropriate target market talk about issues of interest to the researcher.

Ans to Q6: An **experiment** is formed when the researcher manipulates one or more independent variables and determines their effect on one or more dependent variables measured on the test units, while controlling for the effect of extraneous variables.

Ans to Q7: An **experimental design** is a set of procedures specifying (1) the test units and how these units are to be divided into homogeneous subsamples, (2) what independent variables or treatments are to be manipulated, (3) what dependent variables are to be measured, and (4) how the extraneous variables are to be controlled.

Ans to Q8: There are three experimental designs they are :Pre-experimental designs, True experimental designs and statistical design

Ans to Q9: Total error is the variation between the true mean value in the population of the variable of interest and the observed mean value obtained in the marketing research project.

Ans to Q10:Non Sampling Error can be attributed to sources other than sampling and they maybe random or nonrandom.



2.13 MODEL QUESTIONS

Q.1: Define “research design” in your own words.

Q.2: How does formulating a research design differ from developing an approach to a problem?

Q.3: List the major components of a research design.

Q.4: Differentiate between exploratory and conclusive research.

Q.5: Define Casual Research.

Q.6: Compare and contrast cross-sectional and longitudinal designs.

Q.7: Discuss the different types of Experimental Designs.

Q.8: Discuss the Errors affecting a Good Research Design.

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UNIT: 3 REVIEWING THE LITERATURE

UNIT STRUCTURE

3.1 Learning Objectives

3.2 Introduction

3.3 Defining Secondary Data

3.4 Definition and Purpose of literature Review

3.5 Types of Literature Review

3.6 Process of Literature Review

3.7 Examples of Literature Review

3.8 Let Us Sum Up

3.9 Further Reading

3.10 Answer To Check Your Progress

3.11 Model Question

3.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- define Secondary data
- define literature review
- explain Purpose of literature review
- describe different types of literature review
- explain the process of literature review
- acquainted with some of the examples of literature review

3.2 INTRODUCTION

This is the third unit of the course. In the earlier unit you have got a fair idea about research. In this unit we are going to discuss about literature review. A literature review is a survey of everything that has been written about a particular topic, theory, or research question. It may provide the background for larger work, or it may stand on its own. An effective literature review analyzes and synthesizes information about key themes or issues. Review of literature is done based on secondary data. So in this unit, we will also discuss some points on secondary data and its advantages and

disadvantages. This unit will also give an idea about how to conduct literature review for research.

3.3 DEFINING SECONDARY DATA

After the selection of research problem, the next step is to gather requisite data. These data can be collected either through survey (primary data) or through other sources (secondary data).

Definition: Any data which have been gathered earlier for some other purposes are called as secondary data.

let us now discuss the advantages and disadvantages of secondary data.

- **Advantages of secondary data:**
  - i. It is very economical, as the cost of collecting original data is saved.
  - ii. It saves much time, as the data are easily available.
  - iii. Primary data collection becomes more specific and relevant with the help of secondary data.
  - iv. Finally, secondary data can be used as a basis for comparison with primary data that the researcher has just collected.
- **Disadvantages of secondary data:**
  - i. One does not always know how accurate the secondary data are. In case the degree of inaccuracy is high, the use of such data would undermine the utility of the research study.
  - ii. A severe limitation in the use of secondary data is that they may be somewhat out of date.

3.4 DEFINITION AND PURPOSE OF LITERATURE REVIEW

Generally literature review is considered as a summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to a particular area of research or interest.

Within the review the author provides a description, summary and critical evaluation of each source, i.e. the strengths and weaknesses. The literature review may also identify gaps or controversies in the literature and topics needing further research.

Definition: A literature review is an evaluative report of information found in the literature related to your selected area of study. The review should describe, summarise, evaluate and clarify this literature. It should give a theoretical base for the research and help you (the author) determine the nature of your research.In writing the literature review, your purpose is to convey to your reader what knowledge and ideas have been established on a topic, and what their strengths and weaknesses are. As a piece of writing, the literature review must be defined by a guiding concept (e.g., your research objective, the problem or issue you are discussing or your argumentative thesis). It is not just a descriptive list of the material available, or a set of summaries

Besides enlarging your knowledge about the topic, writing a literature review lets you gain and demonstrate skills in two areas

1. **information seeking**: the ability to scan the literature efficiently, using manual or computerized methods, to identify a set of useful articles and books
2. **critical appraisal**: the ability to apply principles of analysis to identify unbiased and valid studies.

The format of the literature review may vary from discipline to discipline, and from assignment to assignment, but the purpose is standard: critical analysis of a body of knowledge through summation and comparison.

The analytical features of a literature review might:

- provide the historical background for your research;
- describe issues, debates, theories, concepts and related research in the field; and
- shows how your research will extend these or address a gap.
- Give a new interpretation of old material or combine new with old interpretations.

- Depending on the situation, evaluate the sources and advise the reader on the most pertinent or relevant research, or
- Usually in the conclusion of a literature review, identify where gaps exist in how a problem has been researched to date

Purposes of literature review:

- Place each work in the context of its contribution to understanding the research problem being studied.
- Describe the relationship of each work to the others under consideration.
- Identify new ways to interpret prior research.
- Reveal any gaps that exist in the literature.
- Resolve conflicts amongst seemingly contradictory previous studies.
- Identify areas of prior scholarship to prevent duplication of effort.
- Point the way in fulfilling a need for additional research.
- Locate your own research within the context of existing literature.

3.5 TYPES OF LITERATURE REVIEW

Depending on the type of research one conducts, the type of literature review varies. Generally a review can be either a book review, annotated bibliography or literature review.

Book Review	Annotated Bibliography	Literature Review
Analyzes and evaluates a particular book.	Summarizes relevant sources and explains the significance of that source to the research question.	Surveys all relevant literature to determine what is known and not known about a particular topic.

Other types of literature review are:

1. **Argumentative Review:** This form examines literature selectively in order to support or refute an argument, deeply imbedded assumption, or philosophical problem already established in the literature. The purpose is to develop a body of literature that establishes a contrarian viewpoint.
2. **Integrative Review:** Considered a form of research that reviews, critiques, and synthesizes representative literature on a topic in an

integrated way such that new frameworks and perspectives on the topic are generated. The body of literature includes all studies that address related or identical hypotheses or research problems. A well-done integrative review meets the same standards as primary research in regard to clarity, rigor, and replication. This is the most common form of review in the social sciences.

3. **Historical Review:** Few things rest in isolation from historical precedent. Historical literature reviews focus on examining research throughout a period of time, often starting with the first time an issue, concept, theory, phenomena emerged in the literature, then tracing its evolution within the scholarship of a discipline.
4. **Methodological Review:** Reviewing methods of analysis provides a framework of understanding at different levels [i.e. those of theory, substantive fields, research approaches, and data collection and analysis techniques], how researchers draw upon a wide variety of knowledge ranging from the conceptual level to practical documents for use in fieldwork in the areas of ontological and epistemological consideration, quantitative and qualitative integration, sampling, interviewing, data collection, and data analysis.
5. **Systematic Review:** This form consists of an overview of existing evidence pertinent to a clearly formulated research question, which uses pre-specified and standardized methods to identify and critically appraise relevant research, and to collect, report, and analyze data from the studies that are included in the review. The goal is to deliberately document, critically evaluate, and summarize scientifically all of the research about a clearly defined research problem.
6. **Theoretical Review:** The purpose of this form is to examine the corpus of theory that has accumulated in regard to an issue, concept, theory, phenomena. The theoretical literature review helps to establish what theories already exist, the relationships between them, to what degree the existing theories have been investigated, and to develop new hypotheses to be tested.



CHECK YOUR PROGRESS

Q.1 : Define Secondary data.

.....

.....

Q.2 : State any two types of literature review.

.....

.....

3.6 PROCESS OF LITERATURE REVIEW

Writing a literature review is often the most daunting part of writing an article, book, thesis, or dissertation. Though there is no hard and fast rule for writing a literature review, for systematic writing of literature six steps were given below:

Step One: Determine the information needed:

Before you begin to search for articles or books, decide beforehand what areas you are going to research. Make sure that you only get articles and books in those areas, even if you come across fascinating books in other areas.

Step Two: Explore the information source available:

Conduct a comprehensive bibliographic search of books and articles in your area. Read the abstracts online and download and/or print those articles that pertain to your area of research. Find books in the library that are relevant and check them out. Set a specific time frame for how long you will search.

Step Three: Read and highlight evidence:

Skim the contents of each book and article and look specifically for these five things:

1. Claims, conclusions, and findings about the constructs you are investigating
2. Definitions of terms
3. Calls for follow-up studies relevant to your project
4. Gaps you notice in the literature
5. Disagreement about the constructs you are investigating

Step Four: Make notes (Code the literature):

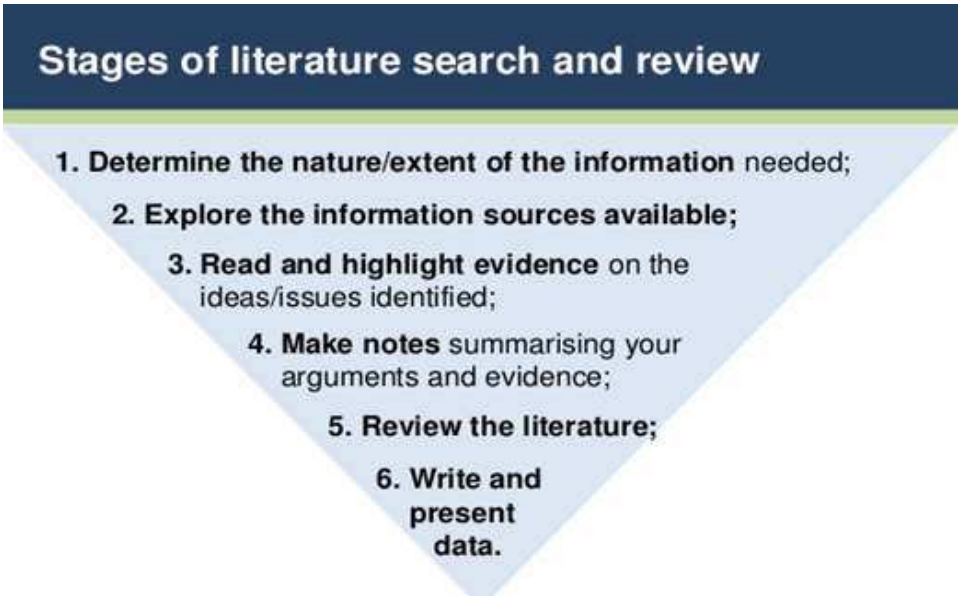
Figure out what the main themes are. Place each excerpt into a themed pile. Make sure each note goes into a pile. If there are excerpts that you can't figure out where they belong, separate those and go over them again at the end to see if you need new categories.

Step Five: Review the literature:

Review the literature from your point of view and explain how relevant it is for your research.

Step Six: Write and present data:

Choose any section of your conceptual schema to begin with. You can begin anywhere, because you already know the order. Figure out a mini-conceptual schema based on that theme by grouping together those excerpts that say the same thing. Don't forget to include the citations as you write, so as not to lose track of who said what. Repeat this for each section of your literature review.



Ways to Organize Your Literature Review:

There are different ways for organizing literature review. Some of them are discussed as below:

- **Chronology of Events:**

If your review follows the chronological method, you could write about the materials according to when they were published. This approach should

only be followed if a clear path of research building on previous research can be identified and that these trends follow a clear chronological order of development.

- **Thematic ["conceptual categories"]:**

Thematic reviews of literature are organized around a topic or issue, rather than the progression of time. However, progression of time may still be an important factor in a thematic review. For example, a review of the Internet's impact on American presidential politics could focus on the development of online political satire. While the study focuses on one topic, the Internet's impact on American presidential politics, it will still be organized chronologically reflecting technological developments in media. The only difference here between a "chronological" and a "thematic" approach is what is emphasized the most: the role of the Internet in presidential politics. Note however that more authentic thematic reviews tend to break away from chronological order. A review organized in this manner would shift between time periods within each section according to the point made.

Methodological:

A methodological approach focuses on the methods utilized by the researcher. A methodological scope will influence either the types of documents in the review or the way in which these documents are discussed.

3.7 EXAMPLES OF LITERATURE REVIEW

Two examples of literature review were given in the following:

- Keller (2003), analyses the key issues i.e. synthesizing the multi dimensionality of branding elements to measure brand knowledge. This study presented a representation of brand knowledge based largely on cognitive psychology. The study demonstrated that, Consumer brand knowledge relates to the cognitive representation of the brand. The study defined Consumer brand knowledge in terms of the all descriptive and evaluative brand-related information of a brand stored in consumer memory. According to this study, the multiple dimensions of brand knowledge are Awareness, Attributes,

Benefits, Images, Thoughts, Feelings, Attitudes and Experiences. The study concludes that, the multidimensional nature of consumer brand knowledge (in terms of different types of information in consumer memory) and leveraging (in terms of multiple sources of secondary meaning from a linked entity) must be understood and accounted for providing the right perspective and backdrop to consumer research into branding. The study conclude that adopting broader, more holistic perspectives that synthesize the multidimensionality of brand knowledge is critical to advance branding theory and practice, both in general and with brand leveraging in particular.

- V. Srinivasan, Chan Su Park, Dae Ryun Chang (2010) in their study proposes a new approach for measuring, analyzing, and predicting a brand's equity in a Durable product market (cellular phone). The approach takes into account three sources of Brand Equity; Brand Awareness, attribute perception biases, and non attribute. The survey-based study has been conducted among 281 users of digital cellular phone users in Korea by a commercial research firm. Results of the study shows that among the three sources of Brand Equity, Brand Awareness contributes to Brand Equity the largest, and it is the most important attributes for measuring Brand Equity, followed by non attribute preference and to a smaller extent, enhanced attribute perceptions. They also found that, the impacts of a brand's equity on the leading brand's market share and contribution are substantial.
- Example of summarised literature review in tabular form:

Study	Purpose	Stimuli	Design	Findings
Kevin Lane Keller (1993)	Conceptualisation of customer based brand equity	Descriptive	Model Design	Customer based brand equity can be measured through a model of brand knowledge



CHECK YOUR PROGRESS

Q.3 : How many steps are there in systematic literature review process?

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.....

Q.4 : Explain "chronology of events".

.....

.....



3.8 LET US SUM UP

In this unit we have discussed the following:

- A literature review is an evaluative report of information found in the literature related to your selected area of study.
- Literature review is a form of secondary data. Any data which have been gathered earlier for some other purposes are called as secondary data.
- Depending on the type of research one conducts, the type of literature review varies. Generally a review can be either a book review, annotated bibliography or literature review.
  - Other types of literature review are:
  - Argumentative Review
  - Integrative Review
  - Historical Review
  - Methodological Review
  - Systematic Review
  - Theoretical Review
- For systematic writing of literature six steps were given below:
  - Step One: Determine the information needed
  - Step Two: Explore the information source available
  - Step Three: Read and highlight evidence

- Step Four: Make notes (Code the literature)
- Step Five: Review the literature
- Step Six: Write and present data

- There are different ways for organizing literature review, which are below:
- Chronology of Events
- Thematic ["conceptual categories"]
- Methodological



3.9 FURTHER READING

1. Shields, Patricia; Rangarjan, Nandhini (2013). *A Playbook for Research Methods: Integrating Conceptual Frameworks and Project Management*. Stillwater, Oklahoma: New Forums Press. ISBN 1-58107-247-3.
2. www. Wikiepedia.org
3. https://guides.library.harvard.edu/literaturereview
4. http://libguides.usc.edu/writingguide/literaturereview
5. Kakati R. P. and Choudhury S. (2013),Measuring Customer-Based Brand Equity Through Brand Building Blocks for Durables,*The IUP Journal of Brand Management*, Vol. X, No. 2, pp.24-42



3.10 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. 1 : Any data which have been gathered earlier for some other purposes are called as secondary data.

Ans. to Q. 2 : a) Historical review, b) Systematic review

Ans. to Q. 3 : There are six steps in systematic literature review process

Ans. to Q.4 : It is a way of organizing literature review. If your review follows the chronological method, you could write about the materials according to when they were published..



3.11 MODEL QUESTIONS

Q.1: Define literature review.

Q.2: What is secondary data? State its advantages and disadvantages.

Q.3: Discuss different types of literature review.

Q.4: Discuss the process of literature review.

Q.5: Discuss different ways of organizing literature review.

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UNIT 4: RESEARCH PROBLEM AND FORMULATION OF RESEARCH HYPOTHESIS

UNIT STRUCTURE:

4.1 Learning Objectives

4.2 Introduction

4.3 Defining the Research Problem

4.4 Management Decision Problem and Marketing Research Problem

4.5 Components of the Research Problem

- 4.5.1 Analytical Framework and Models
- 4.5.2 Formulation of Research Question and Hypotheses
- 4.5.3 Specification of Information Needed

4.6 Contents of a Research Proposal

4.7 Let Us Sum Up

4.8 Further Reading

4.9 Answers to Check your progress

4.10 Model Questions

4.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- discuss the meaning of Research Problem.
- outline the differences between Management Decision Problem and Management Research Problem.
- discuss the Problem Identification Process.
- define the different components of the Research Problem.
- formulate a Research Hypothesis.
- discuss how to write a Research Proposal.
- discuss the Contents of a Research Proposal.

4.2 INTRODUCTION

In the earlier units we discussed the basic concept in business reserach like the meaning and concept of reserach, reserach design and its various types.

In the previous unit (unit 3), we learned about one iof the main component of reserach i.e literature review. In this unit, let us discuss the various issues related to reserach problem and formulation of research hypotheses.

4.3 DEFINING THE RESEARCH PROBLEM

Although every step in a marketing research project is important, problem definition is the most important step. As mentioned in Unit 1, marketing or business researchers consider problems and opportunities confronting management to be interchangeable because the investigation of each follows the same research process. **Problem definition** involves stating the problem confronting the managers (the management decision problem) and the marketing research problem that the researcher will address. The latter should be broken down into a broad statement and the specific components of the marketing research problem, as illustrated by the opening feature about ***Harley-Davidson Case Study (Unit 2)***. This example provided the problem confronting ***Harley-Davidson Case Study (Unit 2)*** management and a broad statement of the research problem, and identified its four specific components. The researcher and the key decision makers on the client side should agree on the definition of the problem. The *client* is the individual or organization commissioning the research. The client might be an internal person, as in the case of a research director dealing with a decision maker in her or his own organization. Alternatively, the client might be an external entity if the research is being conducted by a marketing research firm. Only when both parties have clearly defined and agreed on the marketing research problem can research be designed and conducted properly. The basic message here is that it is critical to clearly identify and define the marketing research problem. The problem-definition

process provides guidelines on how to define the marketing research problem correctly.

Research problem is a question that researcherwants to answer or a problem that a researcherwants to solveIdentification & formulation of a research problem isthe first step of the research process.Selection of research problem depends on severalfactors such as researcher'sknowledge, skills, interest, expertise, motivation &creativity with respect to the subject of inquiry.It is believed that most of the good research studiesneed lots of time for selection of a researchproblem.

Some of the definition given by scholars are :

According to Kerlinger, 'A problem is an interrogative sentence or statement that asks whatrelation exists between two or more variable. The answer to question will provide what is having sought in the research.

R.S. Woodworth defines problem as 'a situation forwhich we have no ready & successful response byinstinct or by previous acquired habit. We must findout what to do', i.e. the solution can be found outonly after an investigation.

Thus, 'A research problem is an area ofconcern where there is a gap in the knowledgebase needed for professional practices.

Process of Defining The Problem and Developing An Approach: To define a research problem correctly, the researcher must perform a number of tasks. The researcher must discuss the problem with the decision makers in the client organization, interview industry experts and other knowledgeable individuals, analyze secondary data, and sometimes conduct qualitative research. This informal data collection helps the researcher understand the context or environment within which the problem has arisen. A clear understanding of the marketing environment also provides a framework for identifying the management decision problem: What should the management do? The management decision problem is then translated into a marketing research problem, the problem that the researcher must investigate. Based on the definition of the marketing research problem, the researcher develops an appropriate approach.

The general rule to be followed in defining the research problem is that the definition should (1) allow the researcher to obtain all the information needed to address the management decision problem, and (2) guide the researcher in proceeding with the project.

Researchers make two common errors in problem definition **.** The first arises when the research problem is defined too broadly. A broad definition does not provide clear guidelines for the subsequent steps involved in the project. Some examples of overly broad marketing research problem definitions are

(1) Developing a marketing strategy for the brand,

(2) Improving the competitive position of the firm, or

(3) Improving the company's image. These are not specific enough to suggest an approach to the problem or a research design.

The second type of error is just the opposite: The research problem is defined too narrowly. A narrow focus may preclude consideration of some courses of action, particularly those that are innovative and not obvious. It may also prevent the researcher from addressing important components of the management decision problem. For example, in a project conducted for a major consumer products firm, the management problem was how to respond to a price cut initiated by a competitor. The alternative courses of action initially identified by the firm's research staff were:

(1) decrease the price of the firm's brand to match the competitor's price cut;

(2) maintain price but increase advertising heavily; and

(3) decrease the price somewhat, without matching the competitor's price, and moderately increase advertising.

None of these alternatives seemed promising. When outside marketing research experts were brought in, the problem was redefined as improving the market share and profitability of the product line. Qualitative research indicated that, in blind tests, consumers could not differentiate products offered under different brand names. Consumers also relied on price as an indicator of product quality reasoning that if costs more it must be of a higher quality. These findings led to a creative alternative: Increase

the price of the existing brand and introduce two new brands—one priced to match the competitor and the other priced to undercut it. This strategy was implemented, leading to an increase in market share and profitability.

The likelihood of committing either error of problem definition can be reduced by stating the marketing research problem in broad, general terms and identifying its specific components**.** The broad statement provides perspective on the problem and acts as a safeguard against committing the second type of error. The specific components focus on the key aspects of the problem and provide clear guidelines on how to proceed. They act as a safeguard against committing the first type of error.



CHECK YOUR PROGRESS

Q.1: How is a Research Problem defined?

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.....

Q.2: Define the Problem Definition Process.

.....

.....

4.4 MANAGEMENT DECISION PROBLEM AND MARKETING RESEARCH PROBLEM

The **management decision problem** asks what the decision maker needs to do, whereas the **marketing research problem** asks what information is needed and how it can best be obtained **(see Table 4.1).** Research is directed at providing the information necessary to make a sound decision. The management decision problem is action-oriented, framed from the perspective of what should be done. How should the loss of market share be arrested? Should the market be segmented differently? Should a new product be introduced? Should the promotional budget be increased?

In contrast, the marketing research problem is information-oriented. Research is directed at providing the information necessary to make a sound decision. The management decision problem focuses on the symptoms, whereas the marketing research problem is concerned with the underlying

causes **(see Table 4.2).** Of course, the marketing research problem should be closely linked to the management decision problem. If the researcher addresses the marketing research problem, then the findings should help the decision maker(s) address the management decision problem; that is, effectively make the decision confronting management.

To further illustrate the distinction between the two orientations, consider an illustrative problem: the loss of market share for the Old Spice product line (aftershave, cologne, deodorant). The decision maker is faced with the problem of how to recover this loss (the management decision problem). Possible responses include modifying existing products, introducing new products, reducing prices, changing other elements in the marketing mix, and segmenting the market. Suppose the decision maker and the researcher believe that the problem can be traced to market segmentation; that is, Old Spice should be targeted at a specific segment. They decide to conduct research to explore that issue. The marketing research problem would then become the identification and evaluation of different ways to segment or group the market. As the research process progresses, problem definition can be modified to reflect emerging information. **Table 4.2** provides additional examples, including that of ***Harley-Davidson Case Study (Unit 2)*** feature in this chapter, that further clarify the distinction between the management decision problem and the marketing research problem.

Table 4.1 Management Decision Problem Versus Marketing Research Problem

Management Decision Problem	Marketing Research Problem
• Asks what the decision maker needs to do	• Asks what information is needed and how it should be obtained
• Action-oriented • Focuses on symptoms	• Information-oriented • Focuses on the underlying causes
• Should a new product be introduced?	• To determine consumer preferences and purchase intentions for the proposed new product.
• Should the advertising campaign be changed?	• To determine the effectiveness of the current advertising campaign.
• Should the price of the brand be increased?	• To determine the price elasticity of demand and the impact on sales and profits of various levels of price changes.
• Should Harley-Davidson invest to produce more motor cycles?	• To determine if customers would be loyal buyers of Harley-Davidson in the long term.

Defining the Research Problem:

The general rule to be followed in defining the research problem is that the definition should (1) allow the researcher to obtain all the information needed to address the management decision problem, and (2) guide the researcher in proceeding with the project. Researchers make two common errors in problem definition**.** The first arises when the research problem is defined too broadly. A broad definition does not provide clear guidelines for the subsequent steps involved in the project. Some examples of overly broad marketing research problem definitions are (1) developing a marketing strategy for the brand, (2) improving the competitive position of the firm, or (3) improving the company's image. These are not specific enough to suggest an approach to the problem or a research design.

The second type of error is just the opposite: The marketing research problem is defined too narrowly. A narrow focus may preclude consideration of some courses of action, particularly those that are innovative and not obvious. It may also prevent the researcher from addressing important components of the management decision problem. For example, in a project conducted for a major consumer products firm, the management problem was how to respond to a price cut initiated by a competitor. The alternative courses of action initially identified by the firm's research staff were (1) decrease the price of the firm's brand to match the competitor's price cut; (2) maintain price but increase advertising heavily; and (3) decrease the price somewhat, without matching the competitor's price, and moderately increase advertising. None of these alternatives seemed promising. When outside marketing research experts were brought in, the problem was redefined as improving the market share and profitability of the product line. Qualitative research indicated that, in blind tests, consumers could not differentiate products offered under different brand names. Consumers also relied on price as an indicator of product quality reasoning that if costs more it must be of a higher quality. These findings led to a creative alternative: Increase the price of the existing brand and introduce two new brands—one priced to match the competitor and the other priced to undercut it. This strategy was implemented, leading to an increase in market share and profitability.

The likelihood of committing either error of problem definition can be reduced by stating the marketing research problem in broad, general terms and identifying its specific components. The **broad statement** provides perspective on the problem and acts as a safeguard against committing the second type of error. The **specific components** focus on the key aspects of the problem and provide clear guidelines on how to proceed. They act as a safeguard against committing the first type of error.

4.5 COMPONENTS OF THE RESEARCH PROBLEM

The tasks performed earlier also help in developing an approach. An approach to a marketing research problem should include the following components: analytical framework and models, research questions and hypotheses, and a specification of the information needed. Each of these components are discussed in the following sub sections:

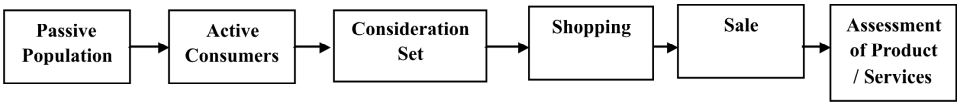
4.5.1 Analytical Framework and Models

In general, marketing research should be based on objective evidence and supported by theory. Objective evidence (evidence that is unbiased and supported by empirical findings) is gathered by compiling relevant findings from secondary sources. A theory is a conceptual framework based on foundational statements that are assumed to be true and that guide the collection of this data. Theory may come from academic literature contained in books, journals, and monographs. For example, according to attitude theory, attitude toward a brand, such as Nike sneakers, is determined by an evaluation of the brand on salient attributes (e.g., price, performance, durability, and style). Relevant theory provides insight regarding which variables should be investigated and which should be treated as dependent variables (those whose values depend on the values of other variables) and which should be treated as independent variables (those whose values affect the values of other variables). Thus, attitude toward Nike will be the dependent variable; price, performance, durability, and style will be independent variables. The

Harley-Davidson Case Study (Unit 2) research was guided by the theory that brand loyalty is the result of positive beliefs, attitude, emotions, and experience with the brand. The approach should be based on some kind of working theory or **analytical framework**. An analytical framework is a statement of the theory as applied to the marketing research problem. This is also helpful in developing an appropriate model.

An **analytical model** consists of a set of variables related in a specified manner to represent all or a part of some real system or process. Models can take many forms, but here we will focus on graphical models. **Graphical models** are visual and pictorially represent the theory. They are used to isolate variables and to suggest directions of relationships; however, they are not designed to provide numerical results. Graphical models are particularly helpful in conceptualizing an approach to the problem, as the following new car purchase model illustrates.

The following graphical model illustrates the new car purchase decision process. A person starts as a passive consumer ("I am not now interested in considering the purchase of a new vehicle"). When the consumer is actively interested in purchasing a new car, the consumer creates a consideration set (limits the brands to be considered). This is followed by shopping, buying (sale), and assessing the value of products and services. Automobile firms such as BMW have used the new car purchase model to formulate marketing strategies that are consonant with consumers' underlying decision-making process. In this model, BMW is part of the consideration set for a certain group of consumers who are interested in luxury and innovation. The 2013 marketing theme of BMW, "BMW Efficient Dynamics. Less emissions. More Driving Pleasure," was based on this model.



4.5.2 Formulation of Research Questions and Hypotheses

Research questions (RQs) are refined statements of the specific components of the problem. A problem component might break into several research questions. Research questions are designed to ask the specific information required to address each problem component. Research questions that address the problem components successfully provide valuable information for the decision maker. The formulation of the research questions should be guided, not only by the problem definition, but also by the analytical framework and the model adopted. In the new car purchase model, the factors that influenced consumers' selection of an automobile brand may be postulated based on theoretical framework as brand name, price, performance, styling, options (features), and quality. Several research questions can be posed related to these factors: What is the relative importance of these factors in influencing consumers' selection of automobiles? Which factor is the most important? Which factor is the least important? Does the relative importance of these factors vary across consumers?

A hypothesis (H) is an unproven statement or proposition about a factor or phenomenon that is of interest to the researcher. It may be a tentative statement about the relationships discussed in the theory or analytical framework or represented in the analytic model. The hypothesis can also be stated as a possible answer to the research question. Hypotheses are statements about proposed relationships rather than merely questions to be answered. They reflect the researchers' expectation and can be tested empirically. Hypotheses also play the important role of suggesting variables to be included in the research design. In commercial marketing research, the hypotheses are not formulated as rigorously as they are in academic research.

4.5.3 Specification of Information Needed

By focusing on each component of the problem, the research questions and hypotheses, the researcher can determine what information should be obtained. It is helpful to carry out this exercise for each component of the problem and to make a list specifying all the information that should be collected. We illustrate this process with respect to the ***Harley-Davidson Case Study (Unit 2).***

Information Needed for Component 1

- Ownership of motorcycles (Harley-Davidson and its competitors). Interest in potentially owning a motorcycle if they do not currently have one.
- Standard demographic characteristics (e.g., gender, marital status, household size, age, education, occupation, income, and type and number of automobiles owned) and psychographic characteristics. Psychographic characteristics include outdoor and recreational activities, family orientation, and attitude toward adventure.

Information Needed for Component 2

- No new information to be collected. The segments can be identified based on information obtained for the first component.

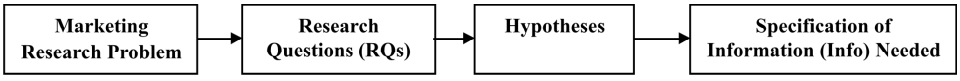
Information Needed for Component 3

- Ratings of Harley-Davidson motorcycles on image, features, brand name, and subjective perceptions.

Information Needed for Component 4

- Attitudes toward, preferences for, and repurchase of Harley-Davidson motorcycles.

This process is further illustrated by the United Airlines Case.



United Airline, the world's leading airline as of 2014, had to deal with passenger loyalty, as did other major airlines. Its management decision problem: how to attract more and more loyal

passengers? The broad marketing research problem was to identify the factors that influence the loyalty of airline travelers. The basic answer is to improve service. Exploratory research, theoretical framework, and empirical evidence reveal that the consumers' choice of an airline is influenced by safety, the price of the ticket, the frequent-flyer program, convenience of scheduling, and brand name.

A graphical model stipulated that consumers evaluate competing airlines based on factors of the choice criteria for selecting a preferred airline. The problem was that major airlines were quite similar on these factors. Indeed, "airlines offer the same schedules, the same service, and the same fares." Consequently, United Airlines had to find a way to differentiate itself. Food turned out to be the solution.

Secondary data, like the J. D. Power & Associates survey on "current and future trends in the airline food industry," and analysis of social media indicated that "food service is a major contributor to customer loyalty."

This survey also emphasized the importance of food brands. The airline's Marketrak survey told United Airlines that "customers wanted more varied and up-to-date food." The following research questions and hypotheses may be posed.

RQ1: How important is food for airline customers?

H1: Food is an important factor for airline travellers.

H2: Travellers value branded food.

H3: Travellers prefer larger food portions but with consistent quality.

H4: Travellers prefer exotic food.

Specification of information needed included the identification of competing airlines (Delta, American, etc.), factors of the choice criteria (already identified), measurement of airline travel, and loyalty. This kind of research helped United Airlines to define their marketing research problem and develop the approach. Focus groups and surveys were conducted to check customers' perceptions of food

in United Airlines' aircraft. The results provided support for all the hypotheses (H1 to H4). United Airlines then made a few changes: new "culinary menus," larger portions of food, new coffee, and branded products (e.g., Godiva chocolates). As of 2014, snack offerings were available for purchase on most flights longer than two hours. This resulted in better service, increasing customer satisfaction and fostering loyalty.



CHECK YOUR PROGRESS

Q.3: What is a Research Question?

.....

.....

Q.4: What is a Research Hypothesis?

.....

.....

4.6 CONTENTS OF A RESEARCH PROPOSAL

Once the research design has been formulated and budgeting and scheduling of the project accomplished, a written research proposal should be prepared. The **Research Proposal** contains the essence of the project and serves as a contract between the researcher and management. The research proposal contains all phases of the marketing research process. It describes the research problem, the approach, the research design and how the data will be collected, analyzed and reported. It gives a cost estimate and time schedule for completing the project. Although the format of research proposal may vary considerably, most proposals addresses all steps of the research process and contain the following elements.

(i) ***Executive Summary –*** The proposal should be begin with a summary of the major points from each of the other sections, presenting an overview of the entire proposal.

(ii) ***Background –*** The background to the problem, including the environmental context, should be discussed.

(iii) ***Problem Definition/Objectives of the Research –*** Normally, a statement of the problem, including the specific components, should be presented. If this statement has not been developed (as in the case of problem identification research), the objectives of the marketing research project should be clearly specified.

(iv) ***Approach to the Problem –*** At a minimum, a review of the relevant academic and trade literature should be presented, along with some kind of an analytical model. If research questions and hypothesis have been identified, then these should be included in the proposal.

(v) ***Research Design –*** The research design adopted, whether exploratory, descriptive, or causal, should be specified. Information should be provided on the following components. Information should be provided on the following components: (a) Kind of information to be obtained , (b) method of administering the questionnaire (mail, telephone, personal or electronic interviews), (c) scaling techniques, (d) nature of the questionnaire (type of questions asked, length, interviewing time), (e) sampling plan and sample size.

(vi) ***Fieldwork/Data Collection –*** The proposal should discuss how the data will be collected and who will collect it. If the fieldwork is to be subcontracted to another supplier, this should be stated. Control mechanisms to ensure the quality of data collected should be described.

(vii) ***Data Analysis -***–– The kind of data analysis that will be conducted (simple cross tabulations, univariate analysis, multivariate analysis) and how the results will be interpreted should be described.

(viii) ***Reporting –*** The proposal should specify whether intermediate reports will be presented and at what stages, what will be the form of the final report, and whether a formal presentation of the results will be made.

(ix) ***Cost and Time*** – The cost of the project and a time schedule, broken down by phases, should be presented. A CPM or PERT chart might be included. In large projects, a payment schedule is also worked out in advance.

(x) ***Appendices -***–– Any statistical or other information that is of interest only to a few people should be contained in the appendices.

Preparing a research proposal has several advantages. It ensures that the researcher and management agree about the nature of the project and helps sell the project to management. Because preparation of the project entails planning, it helps the researcher conceptualize and execute the marketing research project.



CHECK YOUR PROGRESS

Q.5: What is a Research Proposal?

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Q.6: What are the contents of a Research Proposal?

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4.7 LET US SUM UP

Defining the research problem is the most important step in a research project. It is a difficult step because management frequently has not determined the actual problem or has only a vague notion about it. The researcher's role is to help management identify and isolate the problem. The tasks involved in formulating the marketing research problem include discussions with management, including the key decision makers, interviews with industry experts, analysis of secondary data, and qualitative research. These tasks should lead to an understanding of the environmental context of the problem. The environmental context of the problem should be analyzed

and certain essential factors evaluated. These factors include past information and forecasts about the industry and the firm, objectives of the DM, buyer behavior, resources and constraints of the firm, the legal and economic environment, and marketing and technological skills of the firm.

Analysis of the environmental context should assist in the identification of the management decision problem, which should then be translated into a marketing research problem. The management decision problem asks what the DM needs to do, whereas the marketing research problem asks what information is needed and how it can be obtained effectively and efficiently. The researcher should avoid defining the marketing research problem either too broadly or too narrowly. An appropriate way of defining the marketing research problem is to make a broad statement of the problem and then identify its specific components.

Developing an approach to the problem is the second step in the marketing research process. The components of an approach consist of an analytical framework and models, research questions and hypotheses, and specification of the information needed. It is necessary that the approach developed be based on theory or an analytical framework. The relevant variables and their interrelationships may be neatly summarized by a graphical model. The research questions are refined statements of the specific components of the problem that ask what specific information is required with respect to the problem components. Research questions may lead to specific hypotheses. Finally, given the problem definition, research questions, and hypotheses, the information needed can be specified. When defining the problem or developing an approach in international marketing research, the researcher must consider the differences in the environment prevailing in the domestic market and the foreign markets. Analysis of social media content can facilitate problem definition and the development of an approach. Several ethical issues that have an impact on the client and the researcher can arise at this stage, but they can be resolved by adhering to the codes of ethics of marketing research associations.



4.8 FURTHER READING

1. Malhotra, N.K. and Dash, S. (2011). *Marketing research: An Applied Orientation* (6th edition), New Delhi: Pearson Education.



4.9 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q1: A research problem is an area ofconcern where there is a gap in the knowledgebase needed for professional practices

Ans to Q2: Problem definition involves stating the problem confronting the managers (the management decision problem) and the marketing research problem that the researcher will address.

Ans to Q3: Research questions (RQs) are refined statements of the specific components of the problem. A problem component might break into several research questions. Research questions are designed to ask the specific information required to address each problem component.

Ans to Q4: A hypothesis (H) is an unproven statement or proposition about a factor or phenomenon that is of interest to the researcher. It may be a tentative statement about the relationships discussed in the theory or analytical framework or represented in the analytic model.

Ans to Q5: The Research Proposal contains the essence of the project and serves as a contract between the researcher and management. The research proposal contains all phases of the research process.

Ans to Q6: *The contents of research proposal are:*

- ***(i)*** *Executive Summary*
- ***(ii)*** *Background*
- ***(iii)*** *Problem Definition/Objectives of the Research*
- ***(iv)*** *Approach to the Problem*
- ***(v)*** *Research Design*
- ***(vi)*** *Fieldwork/Data Collection*

(vii) *Data Analysis*

(viii) *Reporting*

(ix) *Cost and Time*

(x) *Appendices*



4.10 MODEL QUESTIONS

Q.1: What is the first step in conducting a marketing research project?

Q.2: Why is it important to define the marketing research problem appropriately?

Q.3: What are some reasons why management is often not clear about the real problem?

Q.4: What is the role of the researcher in the problem-definition process?

Q.5: What is the environmental context of a marketing research problem?

Q.6: What are some differences between a management decision problem and a marketing research problem?

Q.7: What are the common types of errors encountered in defining a marketing research problem? What can be done to reduce the incidence of such errors?

Q.8: What guides the formulation of a research question?

Q.9: Is it necessary for every research project to have a set of hypotheses? Why or why not?

Q.10: What is the most common form of analytical models?

Q.11: What a contents required in writing a Research Proposal ?

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UNIT 5: PRIMARY AND SECONDARY DATA

UNIT STRUCTURE

5.1 Learning Objectives

5.2 Introduction

5.3 Concept of Primary Data and Secondary Data

5.4 Secondary Data Collection Method

5.5 Advantages and Disadvantages of Secondary Data

5.6 Primary Data Collection Method

5.7 Let Us Sum Up

5.8 Further Reading

5.9 Answers to Check your progress

5.10 Model Questions

5.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- learn the difference between primary data and secondary data
- classify the different types of secondary data and its sources
- discuss the uses, advantages and disadvantages of secondary data.
- discuss the different primary data collection methods like Observation Method, Focus Group Discussion , Personal Interview Method

5.2 INTRODUCTION

In this unit we are going to discuss the concepts of primary data and secondary data, classify the different types of secondary data and its sources, the uses, advantages and disadvantages of secondary data.We will also able to learn the different primary data collection methods like Observation Method, Focus Group discussion and personal Interview Method.

5.3 CONCEPT OF PRIMARY DATA AND SECONDARY DATA

An early outcome of the research process is to define the marketing research problem and to identify specific research questions and hypotheses. When data are collected to address a specific research problem, they are referred to as **primary data**. Obtaining primary data can be expensive and time-consuming because it involves all six steps of the marketing research process. Before initiating primary data collection, a researcher should remember that the problem under study might not be unique. It is possible that someone else has investigated the same or a similar marketing research problem. A search through existing data might lead to relevant information. **Secondary data** represent any data that have already been collected for purposes other than the problem at hand. Relative to primary data collection, these data can be located quickly and inexpensively. The differences between primary and secondary data are summarized in Table 5.1.

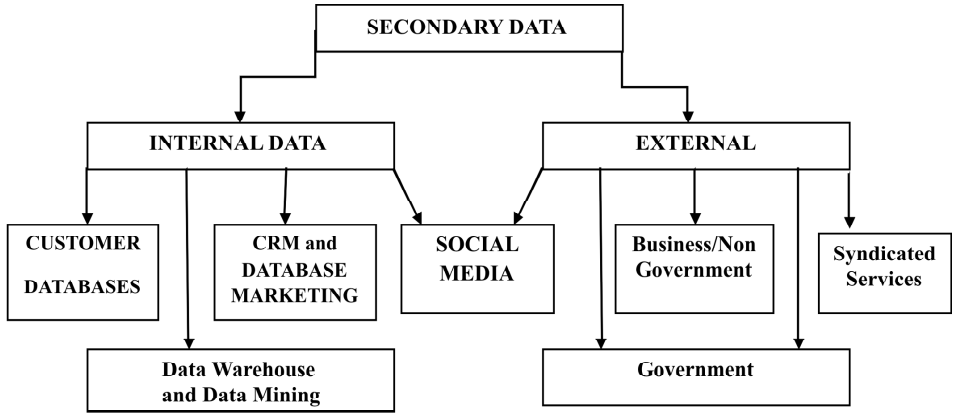
	Primary Data	Secondary Data
Collection purpose	For the problem at hand	For other problems
Collection process	Very involved	Rapid and easy
Collection cost	High	Relatively low
Collection time	Long	Short

Table 5.1: Comparison of Primary and Secondary Data

5.4 SECONDARY DATA COLLECTION METHOD

As represented in Figure below, the two primary sources of secondary data are internal and external data. **Internal data** are data generated within the organization for which the research is being conducted. Many organizations are engaged in building large customer databases, data warehousing and data mining, and customer relationship management (CRM) and database marketing. They are also using social media to generate internal secondary data. **External data** are data generated by sources outside the organization. These data are available in the form of business/ non government sources, government sources, syndicated services, and social media. Thus, social media are sources of both internal and external

secondary data and are discussed later in this chapter. We next focus on the sources of internal secondary data.



A. Internal Secondary Data: Before collecting external secondary data, it is always useful to analyze internal secondary data. Internal data are typically generated as part of the ongoing process of doing business. These data can come from accounting records, sales reports, production or operation reports, or internal experts. Although it is possible that internal secondary data might be available in usable form, it is more typical that considerable processing effort will be required before such data can be used. For example, cash register receipts of a department store might contain a wealth of information, such as sales by product line, sales by specific store, sales by geographical region, sales by cash versus credit purchases, sales in specific time periods, sales by size of purchase, and so on. To derive this information, however, data must be transcribed from the paper-based sales receipts to a computer database and analyzed extensively. Many organizations are building sophisticated customer databases as platforms for their marketing efforts.

1. Customer Databases: For many companies, the first step in creating a customer database is to transfer raw sales information, such as that found on sales call reports or invoices, to a personal computer. Customer information is also obtained from other sources, such as warranty cards and loyalty programs (e.g., frequent flier programs of airlines). This is augmented with demographic and psychographic

information about the customers obtained from external secondary sources. **Psychographics** refers to quantified psychological profiles of individuals. Several companies in this business, such as Experian (www.experian.com), have compiled household lists that include names, addresses, and a great deal of individual-specific data. The size of these customer databases can be staggering. Sears, for example, has more than 75 percent of Indian households in its customer database. These customer databases reside in a data warehouse.

2. **Data Warehouse and Data Mining:** A **data warehouse** is a centralized database that consolidates companywide data from a variety of operational systems. The analysis of such large databases requires special skills and resources and has been termed *data mining*. **Data mining** involves the use of powerful computers with advanced statistical packages and other software to analyze large databases to discover hidden patterns in the data. The patterns discovered can be very useful for targeting marketing effort. For example, data mining revealed that husbands tend to buy additional life insurance immediately after the birth of their first child. Therefore, LICI's slogan, "Zindegi ke Saath bhi, Zindegi ke bad bhi," is particularly appropriate for targeting first-time fathers with life insurance products.
3. **CRM and Database Marketing:** Customer databases and data mining are the building blocks for **customer relationship management (CRM) systems.** A CRM is a decision support system that is used for managing the interactions between an organization and its customers. **Database marketing** is the practice of using CRM databases to develop relationships and highly targeted marketing efforts with individuals and customer groups. For example, recently Whirlpool used its massive database to identify families of four or more who had bought Whirlpool washers and/or dryers five years ago and offered them special discounts to replace their machines with newer models. This effort was successful as the targeted household realized that their machines had lived the average life span and needed to be replaced.

B. External Secoundary Data: As mentioned earlier, external secondary data may be classified as business/nongovernment, government, and syndicated services as shown in the figure above. External secondary data, particularly those available from business/nongovernment sources, have grown dramatically over the past twenty years. This growth has been stimulated, in part, by the Internet and personal computers in the workplace, which gives employees easy access to commercial databases. The following section provides an overview of some of the business/nongovernment sources of external secondary data.

1. Business/Nongovernment Data: Business/nongovernment sources are used as a broad category and encompass non profit organizations (e.g., chambers of commerce), trade and professional organizations, commercial publishers, investment brokerage firms, and for-profit firms. Most of these data can be accessed conveniently over the Internet. Businesses publish a great deal of information in the form of books, periodicals, journals, newspapers, magazines, reports, and trade literature. Moody's (www.moodys.com) and Standard & Poor's (www.standardandpoors.com) provide information on Indian, U.S. and foreign companies. Another useful source for industrial brand and trade information is ThomasNet (www.thomasnet.com). Valuable marketing and marketing research information can be obtained from SecondaryData.com (www.secondarydata.com). A variety of business-related sites can provide sales leads, mailing lists, business profiles, and credit ratings for Indian businesses. Many sites supply information on businesses within a specific industry. For example, all of the Indian Marketing Association's publications can be searched by keywords at www.marketingpower.com. Encyclopedia Britannica provides free online access to its entire thirty-two-volume set (www.britannica.com). Data on U.S. manufacturers and key decision makers can be obtained from Hoovers (www.hoovers.com), a D & B company. Another good source is Infogroup (www.infogroup.com).

2. **Government Sources:** The Indian government is the largest source of secondary data in the country and in the world. The data the government collects could not feasibly be collected by private industry. Its value ranges from use in developing sales forecasts and market potential estimates to simply locating specific retailers, wholesalers, or manufacturers. The breadth and accuracy of government sources make it a rich source of secondary data. Government sources can be divided into census data and other types.

   a. **Census Data :** Census data are useful in a variety of marketing research projects. The demographic data collected by the Census Bureau include information about household types, gender, age, marital status, and race. Consumption detail related to automobile ownership, housing characteristics, work status, and practices as well as occupations are just a few of the categories of information available. What makes this demographic information particularly valuable to marketers is that it can be categorized geographically at various levels of detail. These data can be summarized at various levels, such as city block, block group, census tract, metropolitan statistical area (MSA), consolidated metropolitan statistical area (CMSA), and region (Northeast, Midwest, South, and West), or they can be aggregated for the nation as a whole. In general, the quality of census data is high, and the data are often extremely detailed. Important census data include Census of Housing, Census of Manufacturers, Census of Population, Census of Retail Trade, Census of Service Industries, and Census of Wholesale Trade. Nielsen (www.nielsen.com) has created a number of research tools using census and other lifestyle data. Integrating enhanced census data with internal company databases is a useful application of multiple secondary sources.

3. **Syndicated Services:** In addition to data available from business and government, syndicated sources constitute the other major source of external secondary data. **Syndicated sources,** also referred to as *syndicated services*, are companies that collect and sell common

pools of data of known commercial value and designed to serve information needs shared by a number of clients, including competing firms in the same industry. These data differ from customized research in that the objective guiding the research is common to several client firms. Syndicated firms make their money by collecting data and designing research products that fit the information needs of more than one organization. Any client, even two competitors in the same industry (e.g., Coca-Cola Company and PepsiCo) can purchase the same syndicated data, typically through a subscription process. Syndicated data purchased by Starbucks were also available to its competitors, namely, Nestle and Kraft Foods. The data and reports that syndicated services supply to client companies can be personalized to fit their specific needs. For example, reports could be organized on the basis of the client's sales territories or product lines. The cost of syndicated data is marginal compared to the cost of collecting primary data. Hence, it is useful to examine applicable syndicated data before collecting primary data.



CHECK YOUR PROGRESS

Q.1: Define Secondary Data?

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Q.2: Classify the different types of Internal Secondary Data ?

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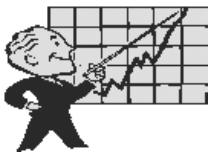
5.5 ADVANTAGES AND DISADVANTAGES OF SECONDARY DATA

The main advantages of secondary data are the time and money they can save because the researcher does not have to go through the six steps of the marketing research process; someone else has already done that. The collection of some secondary data, such as those provided by the

Department of Labor or the Census Bureau, would not be feasible for individual firms such as Maruti Suzuki or Tata Motors. In some projects, particularly those with limited budgets, research may be largely confined to the analysis of secondary data because some routine problems may be addressed based only on secondary data. Although it is rare for secondary data to provide all the answers to a non routine research problem, analysis of secondary data should always be the first step taken toward solving any research problem. Given these advantages and uses of secondary data, we state a basic rule of research:

Examine available secondary data first. The research project should proceed to primary data collection only when the secondary data sources have been reasonably exhausted or yield marginal returns. Analysis of secondary data can provide valuable insights and lay the foundation for conducting more formal research, such as focus groups and surveys.

However, the researcher should be cautious when using secondary data because they have some disadvantages as well. The value of secondary data is typically limited by their degree of fit with the current research problem. Because secondary data have been collected by someone else for purposes other than the problem at hand, they may have only limited applicability to the current problem. The objectives, nature, and methods used to collect secondary data might not be compatible with the present situation. Also, secondary data might be lacking in terms of accuracy, compatibility of units of measurement, or timeframe. Before using secondary data, it is important to evaluate their usefulness and fit.



CHECK YOUR PROGRESS

Q.3: What are the advantages and disadvantages of secondary data?

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5.6 PRIMARY DATA COLLECTION METHOD

1. **OBSERVATION:** Observation methods are the second type of methodology used in descriptive research. **Observation** involves recording the behavioural patterns of people as well as data on objects and events in a systematic manner to obtain information about the phenomenon of interest. The observer does not question or communicate with the people being observed. Information can be recorded as the events occur or from records of past events. The major observation methods are personal observation and mechanical observation.

   a. **Personal Observation:** In personal observation, a trained observer collects the data by recording behavior exactly as it occurs. A real life case showed how Heinz used personal observation to introduce "Dip and Squeeze" ketchup packets. The observer does not attempt to control or manipulate the phenomenon being observed but simply records what takes place. For example, a researcher might record traffic counts and observe traffic flows in a department store. This information could aid in determining store layout, the location of individual departments, shelf locations, and merchandise displays. **Humanistic inquiry** is a special form of personal observation in which the researcher is immersed in the system under study. This is in contrast to the traditional scientific method, in which the researcher is a dispassionate observer. In yet another application, called on-site observation, observers are positioned in supermarkets and presented as shoppers who need advice from another shopper in making purchase decisions.

The main advantage of personal observation is that it is highly flexible because the observer can record a wide variety of phenomena. It is also highly suitable for use in natural settings. For example, the sales manager of General Motors can observe the attitudes of dealers toward a new inventory policy at one of the regular sales meetings.

The main disadvantage is that the method is unstructured: An observation form is generally not used for recording the behavior as it occurs.

Rather, the observer records the phenomenon after completing the observation in a free, unstructured format. This leads to high observation bias and recording bias. Also the data and their interpretation are highly subjective, leading to high analysis bias, i.e., bias in data analysis and interpretation.

b. **Mechanical Observation:** Mechanical observation, as one would expect, involves the use of a mechanical device to record behaviour. These devices might or might not require respondents' direct participation. Such devices are particularly useful for recording continuous behavior, such as traffic flow in a grocery store. Nielsen's (www.nielsen.com) peoplemeter is an example of indirect observational devices that do not require active participation on the part of the respondents. Respondents do not need to change their behaviour in any way to be involved in this type of observational study. The peoplemeter is attached to a television and continually records not only the channels the television is tuned to, but also who is watching. Arbitron (www.arbitron.com) has developed the portable peoplemeter, a wearable device that measures what television and radio programming a person watches or listens to during her or his waking hours. The PreTesting Group (www.pretesting.com) uses the People Reader, which unobtrusively records reading material and reader's eye movements to determine the reader's habits as well as the stopping power and the brand recall associated with different sizes of ads.

Other common examples of indirect mechanical observation include turnstiles that record the number of people entering or leaving a building and traffic counters placed across streets to determine the number of vehicles passing certain locations. On-site cameras (still or video) are increasingly used by retailers to assess the impact of package designs, counter space, floor displays, and traffic-flow patterns. The Universal Product Code (UPC) is a built-in source for mechanical observation. For those retailers equipped with optical scanners, the UPC system allows for the automatic collection of consumer purchase information, classifying it by product category, brand, store type, price, and quantity.

The Internet can be a very good source for observation and can provide valuable information. The observations can be made in a variety of ways. The primary observations can be made by the number of times a webpage is visited. The time spent on the page can also be measured through more advanced techniques, such as a timer that starts when a person visits a page and clicks on a certain icon. The timer then stops when the person clicks the next icon. Various other links can be provided by the researcher on the webpage, and the research can observe which links are accessed more often. This will provide the researcher with important data on the information needs of the individuals and also the interests of the target segment.

Table 5.2 Relative Advantages of Observation Methods

Personal Observation	Most flexible Highly suitable in natural settings	High observation bias High analysis bias
Mechanical Observation	Low observation bias Low to medium analysis bias	Can be intrusive Not always suitable in natural settings



CHECK YOUR PROGRESS

Q.4: What are the different types of observation method ?

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Q.5 : What are the advantages of observation method ?

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2. FOCUS GROUP DISCUSSION: A **focus group** is an interview conducted by a trained moderator in an unstructured and natural manner with a small group of respondents. The moderator leads the discussion. The main purpose of focus groups is to gain insights by listening to a group of people from the appropriate target market talk about issues of interest to the researcher. The value of the technique lies in the unexpected findings often obtained from a free-flowing group discussion.

Focus groups are the most important qualitative research procedure. They are so popular that many marketing research practitioners consider this technique synonymous with qualitative research. An application of focus groups was illustrated in a Case Study where Nabisco developed their 100 Calorie Snack Pack. Several hundred facilities around the country now conduct focus groups several times a week. The typical focus group costs range between $6,000 to $8,000. Given their importance and popularity, we describe the salient characteristics of focus groups in detail.

Characteristics of focus group: The major characteristics of a focus group are summarized in Table 5.2. A focus group generally includes eight to twelve members. Groups of fewer than eight are unlikely to generate the momentum and group dynamics necessary for a successful session. Likewise, groups of more than twelve may be too crowded and may not be conducive to a cohesive and natural discussion. The focus groups conducted by Nabisco conformed to this guideline.

A focus group should be homogeneous in terms of demographics, psychographics, and product usage characteristics. Commonality among group members avoids conflicts and interactions among group members on side issues. Thus, a women's group should not combine married homemakers with small children; young, unmarried working women; and elderly divorced or widowed women because their lifestyles are substantially different. If the marketing research project covers distinct segments, then focus groups should be conducted separately for each segment.

The focus group participants should be carefully screened to meet certain criteria. The participants must have had adequate experience with the object or issue being discussed. People who have already participated in numerous focus groups should not be included. These so-called professional respondents are a typical, and their participation leads to serious validity problems.

The physical setting for the focus group is also important. A relaxed, informal atmosphere encourages spontaneous comments. Light refreshments should be served before the session and made available throughout. Although a focus group may last from one to three hours, a

duration time of 1.5 hours is typical. This period of time is needed to establish rapport with the participants and explore, in depth, their beliefs, feelings, ideas, attitudes, and insights regarding the topics of concern. Focus group interviews are invariably recorded, often on video, for subsequent replay, transcription, and analysis. Video recording has the advantage of capturing facial expressions and body movements, but it can increase the costs significantly. Frequently, clients observe the session from an adjacent room using a one-way mirror. Video transmission technology enables the clients to observe focus group sessions live from a remote location. For example, Stamford, Connecticut– based FocusVision Network, Inc. (www.focusvision.com) offers such a videoconferencing system.

The moderator plays a key role in the success of a focus group. The moderator must establish rapport with the participants, keep the discussion moving forward, and probe the respondents to elicit insights. In addition, the moderator may have a central role in the analysis and interpretation of the data. Therefore, the moderator should possess skill, experience, knowledge of the discussion topic and the marketing research project, and an understanding of the nature of group dynamics.

a. **Planning and Conducting Focus Groups:** The procedure for planning and conducting focus groups is described in Figure 4.4. Planning begins by specifying the objectives of qualitative research. This involves an examination of the objectives of the marketing research project. In most instances, the problem has been defined by this stage and, if so, the general statement as well as the specific components of the problem should be carefully studied. Given the problem definition, the objectives of the qualitative research should be clearly determined. These objectives must be specified before conducting any qualitative research, be it focus groups, depth interviews, or projective techniques. In the Case featuring Nabisco, the objectives of qualitative research were to understand the motivations and snack purchase behavior of mothers.

The next step is to develop a detailed list of objectives for the focus group. This may take the form of a list of questions the researcher would

like answered. In the case of Nabisco, the objectives for the focus group were to uncover how mothers felt about lunches and snacking for their children. Then a questionnaire to screen potential participants is prepared. Typical information obtained in the screening questionnaire includes product familiarity and knowledge, usage behavior, attitudes toward and participation in focus groups, and standard demographic characteristics.

A detailed moderator's outline for use during the focus group interview should be prepared. This involves extensive discussions among the researcher, client, and moderator. This outline should specify the topics that will be discussed, the sequence in which they will be covered, and the amount of time that will be spent on each. Topics that will be explored in more detail and the use of flipcharts, other visual aids, products, and other stimuli should be identified. Use of a moderator's outline reduces some of the reliability problems inherent in focus groups, such as those caused by different moderators not covering the same content areas in comparable ways.

After a detailed outline is formulated, participants are recruited and the focus group interview is conducted. During the interview, the moderator must (1) establish rapport with the group members, (2) state the rules of group interaction, (3) set objectives, (4) probe the respondents and provoke intense discussion in the relevant areas, and (5) attempt to summarize the group members' responses to determine the extent of agreement.

Following the group discussion, either the moderator or an analyst reviews and analyzes the data and prepares the focus group report. The analyst not only reports specific comments and findings but also looks for consistent responses, new ideas, concerns suggested by facial expressions and body language, and other hypotheses that may or may not have received confirmation from all of the participants. Because the number of participants is small, frequencies and percentages are not usually reported in a focus group summary. Instead, reports typically include expressions like "most participants thought" or "participants were divided on this issue." Meticulous documentation and interpretation of the session lays the groundwork for the next step, which usually means doing additional research. The major findings of the focus groups for Nabisco were that families, especially

mothers, were trying to portion out snack foods to their children to cut down on caloric intake. Mothers especially appreciated snacks in small portions with fewer calories. Also, convenience was very important.

Advantages and Disadvantages of Focus Groups: Focus groups are popular because of their many advantages. The immediacy and the richness of the comments, which come from real customers, make this technique highly useful. The group interaction produces a wider range of information, insights, and ideas than do individual interviews. The comments of one person can trigger unexpected reactions from others, leading to a snowball effect in which participants respond to each other's comments. The responses are generally spontaneous and candid, providing rich insights. Ideas are more likely to arise out of the blue in a group than in an individual interview and are likely to be unique and potentially creative. However, some of the qualities that make focus groups so strong also create some of their more serious limitations. The disadvantages of focus groups should not be overlooked. The clarity and conviction with which group members often speak lead to a tendency for researchers and managers to regard findings as conclusive rather than as exploratory. Focus groups are also difficult to moderate. The quality of the results depends heavily on the skills of the moderator; unfortunately, moderators who possess all of the desirable skills are rare. The unstructured nature of the responses makes coding, analysis, and interpretation difficult.



CHECK YOUR PROGRESS

Q.6: What are the characteristics of a Focus Group?

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Q.8: What are the advantages and disadvantages of the Focus Group Method ?

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3. **PERSONAL DEPTH INTERVIEW:** Depth interviews are another method of obtaining qualitative data. We describe the general procedure for conducting depth interviews and then discuss their advantages, disadvantages, and applications.

   a. **Conducting Depth Interviews:** Like focus groups, depth interviews are an unstructured and direct way of obtaining information, but unlike focus groups, depth interviews are conducted on a one-to-one basis. A **depth interview** is an unstructured, direct, personal interview in which a single respondent is questioned by a highly skilled interviewer to uncover underlying motivations, beliefs, attitudes, and feelings on a topic.

A depth interview may take from thirty minutes to more than one hour. To illustrate the technique in the context of shopping in department stores, the interviewer begins by asking a general question such as "How do you feel about shopping at department stores?" The interviewer then encourages the subject to talk freely about his or her attitudes toward department stores. After asking the initial question, the interviewer uses an unstructured format. The subsequent direction of the interview is determined by the respondent's initial reply, the interviewer's questions for elaboration, and the respondent's answers. Suppose the respondent replies to the initial question by saying, "Shopping isn't fun anymore." The interviewer might then pose a question such as "Why isn't it fun anymore?" If the answer is not very revealing ("Fun has just disappeared from shopping"), the interviewer may ask a probing question, such as "Why was it fun before and what has changed?"

While the interviewer attempts to follow a rough outline, the specific wording of the questions and the order in which they are asked is influenced by the subject's replies. Probing is of critical importance in obtaining meaningful responses and uncovering hidden issues. Probing is done by asking questions such as "Why do you say that?" "That's interesting; can you tell me more?" or "Would you like to add anything else?"

Advantages and Disadvantages of Depth Interviews: Depth interviews can uncover greater depth of insights than focus groups. Also, depth interviews attribute the responses directly to the respondent, unlike

focus groups, where it is sometimes difficult to determine which respondent made a particular response. Depth interviews result in a free exchange of information that may not be possible in focus groups because there is no social pressure to conform to a group response.

Depth interviews suffer from many of the disadvantages of focus groups and often to a greater extent. Skilled interviewers capable of conducting depth interviews are expensive and difficult to find. The lack of structure makes the results susceptible to the interviewer's influence, and the quality and completeness of the results depend heavily on the interviewer's skills. The data obtained are difficult to analyze and interpret, and the services of skilled psychologists are typically required for this purpose. The length of the interview combined with high costs means that the number of depth interviews in a project will be small. Despite these disadvantages, depth interviews do have some applications. They can be useful when detailed probing is required (e.g., automobile purchase), the topic is sensitive or subject to strong social norms (e.g., attitudes of college students toward dating), or the consumption experience is sensory or complicated (e.g., perfumes, bath soap). They are also effective with respondents who are professionals (e.g., industrial marketing research) and in interviewing respondents who are competitors (e.g., travel agents' perceptions of airline package travel programs).



CHECK YOUR PROGRESS

Q.8: What are the advantages and disadvantages of the Personal Depth Interview Method ?

.....

.....



5.7 LET US SUM UP

In contrast to primary data, which originate with the researcher for the specific purpose of the problem at hand, secondary data are originally

collected for other purposes. Secondary data can be obtained quickly and are relatively inexpensive. However, they have limitations and should be evaluated carefully to determine their appropriateness for the problem at hand. The evaluation criteria consist of specifications, error, currency, objectivity, nature, and dependability. A wealth of information exists in the organization for which the research is being conducted. This information constitutes internal secondary data. External data are generated by sources outside the organization. These data may be classified as business/ nongovernment, government, and syndicated services. Government sources may be broadly categorized as census data and other data. Syndicated sources are companies that collect and sell common pools of data designed to serve a number of clients. Syndicated sources can be classified based on the unit of measurement (households/consumers or institutions). Household/consumer data may be obtained via surveys, purchase and media panels, or electronic scanner services. When institutions are the unit of measurement, the data may be obtained from retailers, wholesalers, or industrial firms and organizations. It is desirable to combine information obtained from different secondary sources.

Qualitative research can reveal the salient differences between the domestic and foreign markets. Whether focus groups or depth interviews should be conducted and how the findings should be interpreted depends heavily on cultural differences. Social media have enhanced both the quality and quantity of qualitative research. When conducting qualitative research, the researcher and the client must respect the respondents by conducting research in a way that does not embarrass or harm the respondents.



5.8 FURTHER READING

1. Malhotra, N.K. and Dash, S. (2011). *Marketing research: An Applied Orientation* (6th edition), New Delhi: Pearson Education.



5.9 ANSWERS TO CHECK YOUR PROGRES

Ans to Q1: Secondary data represent any data that have already been collected for purposes other than the problem at hand.

Ans to Q2: Internal Secondary Data are: Customer Database, data warehouse and data mining, CRM and database marketing

Ans to Q3: Advantages and disadvantages of secondary data are: The main advantages of secondary data are the time and money they can save.Because secondary data have been collected by someone else for purposes other than the problem at hand, they may have only limited applicability to the current problem.

Ans to Q4: The types of Observation methods are:

a. Personal Observation b. Mechanical Observation

Ans to Q5: Advantages of Observation methods:

Ans to Q6:

1. A focus group generally includes eight to twelve members.
2. A focus group should be homogeneous in terms of demographics, psychographics, and product usage characteristics.
3. The participants must have had adequate experience with the object or issue being discussed.

Ans to Q7: Advantages of focus group method:

1. The immediacy and the richness of the comments, which come from real customers, make this technique highly useful.
2. The group interaction produces a wider range of information, insights, and ideas than do individual interviews.
3. The comments of one person can trigger unexpected reactions from others, leading to a snowball effect in which participants respond to each other's comments.

Ans to Q8: Advantages of Personal Depth Interview method:

1. Depth interviews can uncover greater depth of insights than focus groups.

2. Depth interviews attribute the responses directly to the respondent, unlike focus groups, where it is sometimes difficult to determine which respondent made a particular response.

Disadvantages of Personal Depth Interview method:

1. Skilled interviewers capable of conducting depth interviews are expensive and difficult to find.
2. The data obtained are difficult to analyze and interpret, and the services of skilled psychologists are typically required for this purpose.



5.10 MODEL QUESTIONS

Q.1: Why should secondary data always be assessed before primary data?

Q.2: What are the differences between primary and secondary data?

Q.3: What is the difference between a data warehouse and data mining?

Q.4: Differentiate between internal and external secondary data.

Q.5: List and describe the various syndicated sources of secondary data.

Q.6: Describe the different types of observation method with their advantages and disadvantages

Q.7: Why is the focus group the most popular qualitative research technique?

Q.8: Why is the focus group moderator so important in obtaining quality results?

Q.9: How are focus group participants selected?

Q.10: Why should one safeguard against professional focus group respondents?

Q.11: Give two ways in which focus groups can be misused.

Q.12: What would be an integral part of a skilful moderator's process of conducting a depth interview? Why?

Q.13: What are the major advantages of depth interviews?

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UNIT 6 : MEASUREMENT AND SCALING

UNIT STRUCTURE

6.1 Learning Objectives

6.2 Introduction

6.3 Concept of Measurement and Scaling

6.4 Primary Scale of Measurement

6.5 Comparative and Non Comparative Scaling Technique

6.6 Scale Evaluation: Measurement Error

6.7 Criteria for a Good Measurement.

6.8 Let Us Sum Up

6.9 Further Reading

6.10 Answers to Check your progress

6.11 Model Questions

6.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- discuss the concepts of measurement and scaling
- outline the primary scales of measurement and differentiate nominal, ordinal, interval, and ratio scales.
- classify scaling techniques
- describe the non comparative scaling techniques
- discuss the variations involved in constructing itemized rating scales.
- discuss the criteria used for scale evaluation and
- explain how to assess reliability and validity

6.2 INTRODUCTION

Once the type of research design has been determined and the exploratory and conclusive methods of research specified, the researcher can move on to the next phase of the research design: deciding on measurement and scaling procedures. This chapter describes the concepts

of scaling and measurement and discusses four primary scales of measurement: nominal, ordinal, interval, and ratio. We next describe both comparative and non comparative scaling techniques and explain them in detail. The comparative techniques consist of paired comparison, rank order, and constant sum. The non comparative techniques are comprised of continuous and itemized rating scales. We discuss the popular itemized rating scales (the Likert, semantic differential, and Stapel scales), as well as the construction of multi-item rating scales. We show how scaling techniques should be evaluated in terms of reliability and validity, and consider how the researcher selects a particular scaling technique.

6.3 CONCEPT OF MEASUREMENT AND SCALING

Measurement means assigning numbers or other symbols to characteristics of objects according to certain set rules. Note that what we measure is not the object, but some characteristics 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 two reasons. First, numbers permit statistical analysis of the resulting data. Second, numbers facilitate the communication of measurement rules and results. The most important aspect of measurement is that the researcher specifies rules for assigning numbers to the characteristics. The assignment process must be such that there is a one-to-one correspondence between the numbers and the characteristics being measured. For example, the same dollar figures are assigned to households with identical annual incomes. Only then can the numbers be associated with specific characteristics of the measured object, and vice versa. In addition, the rules for assigning numbers should be standardized and applied uniformly. They must not change over objects (e.g., stores) or time (e.g., quarter to quarter in quarterly surveys of customer satisfaction).

Scaling may be considered an extension of measurement. **Scaling** involves creating a continuum upon which measured objects are located. To illustrate, consider a scale for locating consumers according to the characteristic “attitude toward fast-food restaurants.” Each respondent is

assigned a number indicating an unfavourable attitude (measured as 1), a neutral attitude (measured as 2), or a favourable attitude (measured as 3) toward a specific fast-food restaurant. Measurement is the actual assignment of 1, 2, or 3 to each respondent for each restaurant. Scaling is the process of placing the respondents on a continuum with respect to their attitude toward fast food restaurants. Suppose we measured attitudes toward five fast-food restaurants and then added the score of each respondent across the five restaurants to arrive at a total or overall attitude score. The total or overall score would vary from 5 (for a respondent who gave a rating of 1 to each of the five restaurants) to 15 (for a respondent who gave a rating of 3 to each of the five restaurants). In our example, scaling is the process by which respondents would be assigned an overall attitude score varying from 5 to 15.



CHECK YOUR PROGRESS

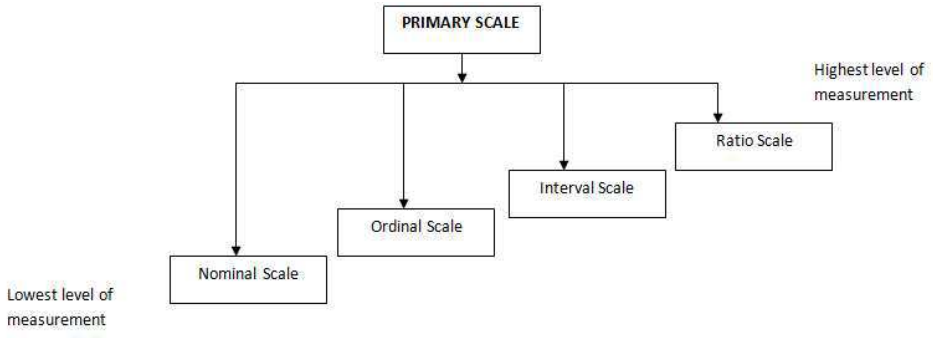
Q.1: Define Measurement and Scaling

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6.4 PRIMARY SCALES OF MEASUREMENT

There are four primary scales of measurement: nominal, ordinal, interval, and ratio (Figure below). Their properties are summarized in Table 5.1 and discussed in the following sections. We illustrate all the primary scales in measuring preference and patronage of fast-food restaurants as given in Table 6.1.The following diagram represents the various types of measurement scales:



1. Nominal Scale: A **nominal scale** is a figurative labeling scheme in which the numbers serve only as labels or tags for identifying and classifying objects. For example, the numbers assigned to respondents in a study constitute a nominal scale. When a nominal scale is used for the purpose of identification, there is a strict one-to-one correspondence between the numbers and the objects. Each number is assigned to only one object, and each object has only one number assigned to it. Common examples include PAN numbers and numbers assigned to Cricket Players. Thus a PAN number can be assigned to one and only one individual, and each individual can be assigned one and only one PAN number. In marketing research, nominal scales are used for identifying respondents, brands, attributes, restaurants, and other people and objects.

When used for classification purposes, the nominally scaled numbers serve as labels for classes or categories. For example, based on gender, you might classify the males as group 1 and the females as group 2. The classes are mutually exclusive and collectively exhaustive. Thus, a person will be classified as either a male or a female, but he or she cannot be classified into both categories because these categories are mutually exclusive. Also, every person will be classified as either a male or a female because these classes are collectively exhaustive; we cannot have a person who does not fall into either of these categories. The objects in each class are viewed as equivalent with respect to the characteristic represented by the nominal number. Thus, all males are considered equivalent with respect to gender, as indeed are all females. All objects in the same class have the same number (i.e., all males are assigned the number 1 and all females are assigned the number 2) and no two classes have the same number (no male can be assigned a number 2 and no female can be assigned the number 1).

The numbers in a nominal scale do not reflect the amount of the characteristic possessed by the objects. For example, a high PAN number does not imply that the person is in some way superior to those with lower PAN numbers, or vice versa. The same applies to numbers assigned to classes. Thus, males (assigned a number 1) are in no way superior or

inferior to females (assigned a number 2). The numbers 1 and 2 merely denote whether a person is a male or female, respectively. The nominal scale represents the lowest level of measurement and is illustrated in the following.

In a fast-food restaurant project, numbers 1 through 5 were assigned to the five restaurants considered in the study. Thus, restaurant number 4 referred to KFC. It did not imply that KFC was in any way superior or inferior to McDonald's, which was assigned the number 2. Any reassignment of the numbers, such as transposing the numbers assigned to KFC and McDonald's, would have no effect on the numbering system because the numerals do not reflect any characteristics of the restaurants.

Table 6.1 : Primary Scales of Measurement

Primary Scale	Basic Characteristics	Common Examples	Marketing Examples
Nominal	Numbers Identify and classify objects	Social Security numbers; numbering of football players	Brand numbers; store types; gender classification
Ordinal	Numbers indicate the relative positions of the objects but not the magnitude of differences between them	Quality rankings; rankings of teams in a tournament	Preference rankings; market position; social class
Interval	Differences between objects can be compared; zero point is arbitrary	Temperature (Fahrenheit; Celsius)	Attitudes; opinions; index Numbers
Ratio	Zero point is fixed; ratios of scale values can be computed	Length; weight	Age; income; costs; sales; market shares

2. 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 characteristic. An ordinal scale allows you to determine whether an object has more or less of a characteristic than another object, but not how much more or less. Thus an ordinal scale indicates relative position, not the magnitude of the differences between the objects. The object ranked first has more of the characteristic compared to the object ranked second, but whether the object ranked second is a close second or a poor second is not known. Measurements of this type include "greater than" or "less than" judgments from the respondents. Thus, an ordinal scale conveys more information than a nominal scale that does not contain "greater than" or "less than" judgments. Common examples of ordinal scales include quality rankings, rankings of teams in a tournament, socioeconomic class, and occupational status. In marketing research, ordinal scales are

used to measure relative attitudes, opinions, perceptions, and preferences. Another common form of ordinal scales is categorical scales (nominal scales) that show order, or more or less of a characteristic such as education levels, age categories, income categories, and so on. In an ordinal scale, equivalent objects receive the same rank. Ordinal scales can be transformed in any way as long as the basic ordering of the objects is maintained because the differences in numbers are void of any meaning other than order. Such transformations result in equivalent scales.

Table 6.2 gives a particular respondent's preference rankings (see the first column under Preference Ranking). Respondents ranked five fast-food restaurants in order of preference by assigning a rank of 1 to the most preferred restaurant, a rank of 2 to the second most preferred restaurant, and so on. The lower number indicates that the restaurant is preferred to one with a higher number. Note that Pizza Hut (ranked 1), is preferred to McDonald's (ranked 2), but how much it is preferred we do not know. Also, it is not necessary that we assign numbers from 1 to 5 to obtain a preference ranking. The second ordinal scale, which assigns a number 10 to Pizza Hut, a number 25 to McDonald's, 30 to KFC, and so on, is an equivalent scale, as it was obtained by transforming the first scale while maintaining the order (see the second column under Preference Ranking). This transformation is based on the rule that the lower the numerical rank, the higher the preference. The first scale, i.e., 1, 2, 3, 4, and 5 and the second scale, i.e., 10, 25, 30, 79, and 82, result in the same ordering of the restaurants according to preference and are therefore equivalent. This equivalence can be seen as follows. 1 is less than 2 and 10 is less than 25; 2 is less than 3 and 25 is less than 30; 3 is less than 4 and 30 is less than 79; 4 is less than 5 and 79 is less than 82. Both scales are based on the same rule, that is, the lower the numerical rank, the higher the preference and both result in the same rank order. As noted earlier, the differences in numbers are void of any meaning other than order. As a further illustration, *Fortune* magazine uses ordinal scaling to determine the world's most admired companies.

TABLE 6.2 : Illustration of Primary Scales of Measurement

Nominal Scale		Ordinal Scale		Interval Scale		Ratio Scale	
Store No	Store Name	Preference Ranking		Preference Ranking		Amt. Spent in Last Two Months	
				1-7	11 - 17	Dollars	Cents
1	Burger King	4	79	4	14	10	1000
2	McDonald's	2	25	7	17	50	5000
3	Subway	5	82	3	13	0	0
4	KFC	3	30	6	16	25	2500
5	Pizza Hut	1	10	7	17	75	7500

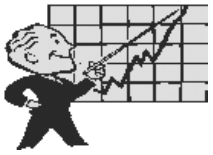
3. Interval Scale: In an **interval scale**, numerically equal distances on the scale represent equal values in the characteristic being measured. An interval scale contains all the information of an ordinal scale, but it also allows you to compare the differences between objects. The difference between any two adjacent scale values is identical to the difference between any other two adjacent values of an interval scale. There is a constant or equal interval between scale values. The difference between 1 and 2 is the same as the difference between 2 and 3, which is the same as the difference between 5 and 6. Thus, an interval scale conveys more information than an ordinal scale that does not contain information on distance. A common example in everyday life is a temperature scale. In marketing research, attitudinal data obtained from rating scales are often treated as interval data. For example, asking respondents to express their degree of agreement with the statement "I like Starbucks coffee" on a 5-point scale (1 = strongly disagree, 5 = strongly agree) will measure their attitude toward Starbucks coffee. Interval scales are widely used in marketing research to obtain data from respondents and are the most popular of all the primary scales. In a Football Tournament, the points assigned to the countries with Spain receiving the highest points amounting to 1614 and Ecuador receiving 1066, the lowest, constituted an interval scale. In an interval scale, the location of the 0 point or the origin is not fixed. Both the origin and the units of measurement are arbitrary. Hence, it is permissible to shift the origin, for example, by adding a constant, and that will result in an equivalent scale. Because the 0 point is not fixed, it is not meaningful to take ratios of scale values. We illustrate this property of the interval scale by examining the information in Table 5.2, which shows a respondent's preferences for the five restaurants expressed on a 1 to 7 rating scale (see the first column under Preference Ratings). We can see

that, although KFC received a preference rating of 6 and Subway a preference rating of 3, this does not mean that KFC is preferred two times as much as Subway. The ratings are then transformed to an equivalent 11 to 17 scale by shifting the origin from 1 to 11. This can be done by adding 10 to each scale value (see the second column under Preference Ratings). Thus, 1 becomes 11, 2 becomes 12, 3 becomes 13, and so on, and seven becomes 17. The transformed ratings for KFC and Subway become 16 and 13, and the ratio is no longer 2 to 1.

4. Ratio Scale: A **ratio scale** possesses all the properties of the nominal, ordinal, and interval scales, plus an absolute 0 point. Thus, the ratio scale represents the highest level of measurement conveying the most information. In ratio scales, we can identify or classify objects, rank the objects, and compare intervals or differences. Unlike the nominal, ordinal, and interval scales, it is also meaningful to compute ratios of scale values. Not only is the difference between 2 and 5 the same as the difference between 14 and 17, but also 14 is seven times as large as 2 in an absolute sense. Common examples of ratio scales include height, weight, age, and income that are measured as exact numbers rather than as categories. In marketing, sales, costs, market share, and the number of customers are variables measured on a ratio scale.

Ratio scales allow only proportionate transformations that involve multiplication by a positive constant. One cannot add an arbitrary constant, unlike the case of an interval scale. An example of this transformation is provided by the conversion of yards to feet (multiplication by 3) or dollars to cents (multiplication by 100). The comparisons between the lengths of objects are identical whether made in yards or feet. Ratio scales are not as popular as interval scales for obtaining information because respondents find it more taxing to provide ratio scale information than they do interval scale data. The ratio scale is further illustrated in the context of the fast-food restaurant example. In Table 6.2, a respondent is asked to indicate the dollar amounts spent in each of the five restaurants during the last two months. Note that, because this respondent spent $50 in McDonald's and only $10 in Burger King, this respondent spent five times as much in

McDonald's as in Burger King. Also, the 0 point is fixed because 0 means that the respondent did not spend anything at that restaurant. Multiplying these numbers by 100 to convert dollars to cents results in an equivalent scale.



CHECK YOUR PROGRESS

Q.2: What are the Primary Scales of Measurement.

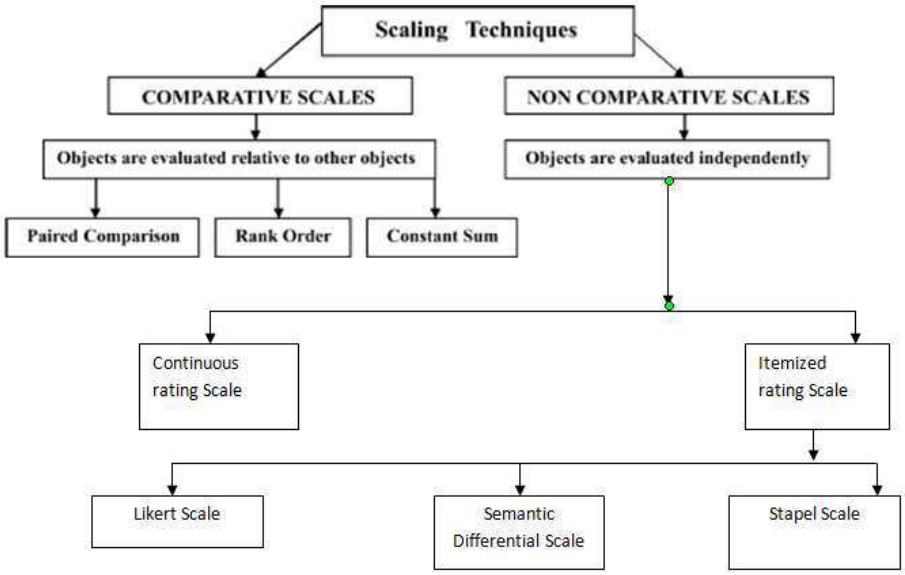
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Q.3: Explain (i) Nominal Scale (ii) Ordinal Scale (iii) Interval Scale (iv) Ratio Scale.

6.5 COMPARATIVE AND NON – COMPARATIVE SCALING TECHNIQUES

The scaling techniques commonly employed in marketing research can be classified into comparative and non comparative scales (see Figure below). **Comparative scales** involve the direct comparison of two or more objects; objects are evaluated in relation to other objects in the stimulus set. For example, respondents might be asked whether they prefer Coke or Pepsi. Comparative scale data must be interpreted in relative terms and have only ordinal or rank-order properties. For this reason, comparative scaling is also referred to as non metric scaling (non metric data have only ordinal properties). As shown in the figure below, comparative scales include paired comparisons, rank order, and constant sum scales. In **non comparative scales,** also referred to as monadic or metric scales, objects are evaluated independently of each other. The resulting data are generally assumed to be interval scale. Metric data have interval or ratio properties. For example, respondents might be asked to evaluate Coke on a 1 to 7 preference scale (1 = not at all preferred, 7 = greatly preferred). Similar evaluations would be obtained independently for Pepsi. The non comparative scales consist of continuous and itemized scales (Likert, Semantic Differential, and Stapel Scales). We consider first comparative scaling techniques and then non comparative scaling techniques.



COMPARITIVE SCALING TECHNIQUES:

1. **Paired Comparison Scaling:** As its name implies, in **paired comparison scaling**, a respondent is presented with two objects and asked to select one according to some criterion. The data obtained are ordinal in nature. A respondent may state that she shops in JC Penney more than in Sears, likes Total cereal better than Kellogg's Product 19, or likes Crest more than Colgate. Paired comparison scales are frequently used when the stimulus objects are physical products. Paired comparison scaling is a widely used comparative scaling technique.

Paired comparison data can be analyzed by calculating the percentage of respondents who prefer one stimulus over another. Paired comparison scaling is useful when the number of brands is limited because it requires direct comparison and overt choice. With a large number of brands, however, the number of comparisons becomes unwieldy. Paired comparisons bear little resemblance to the marketplace situation that involves selection from multiple alternatives. Also respondents may prefer one object over certain others, but they may not like it in an absolute sense (that is, it is disliked less). The following Research in Practice provides further insights into paired comparison scaling.

2. **Rank Order Scaling:** After paired comparisons, the most popular comparative scaling technique is rank-order scaling. Rank-order scaling is similar to the ordinal scale discussed earlier in the section on primary scales. In **rank-order scaling,** respondents are presented with several objects simultaneously and asked to order or rank them according to some criterion. For example, respondents may be asked to rank brands of toothpaste according to overall preference. These rankings are typically obtained by asking the respondents to assign a rank of 1 to the most preferred brand, 2 to the second most preferred, and so on, until a rank of *n* is assigned to the least preferred brand. Like paired comparison, this approach is also comparative in nature, and it is possible that the respondent may dislike, in an absolute sense, the brand ranked first. Rank-order scaling also results in ordinal data. Rank-order scaling is commonly used to measure preferences for brands as well as attributes. Compared to paired comparisons, this type of scaling process more closely resembles the shopping environment. It also takes less time because the respondents have to make fewer judgments compared to paired comparisons. Another advantage is that most respondents easily understand the instructions for ranking. The major disadvantage is that this technique produces only ordinal data.



CHECK YOUR PROGRESS

Q.4: Compare between Comparative and Non Comparative Scaling Techniques ?

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Q.5: What are the different types of Comparative Scaling Techniques ?

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.....

NON- COMPARATIVE SCALING TECHNIQUES:

Respondents using a non comparative scale do not compare the object being rated to either 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 scales are often referred to as monadic scales. In evaluating the objects, the respondents employ whatever rating standard seems appropriate to them.

A. **Continuous Rating Scale:** In a **continuous rating scale**, also referred to as a graphic rating scale, respondents rate the objects by placing a mark at the appropriate position on a line that runs from one extreme of the criterion variable to the other. Thus, the respondents are not restricted to selecting from marks previously set by the researcher. The form of the continuous scale may vary considerably. For example, the line may be vertical or horizontal; scale points, in the form of numbers or brief descriptions, may be provided. The scale points, if provided, may be few or many.

Once the respondent has provided the ratings, the researcher divides the line into as many categories as desired and assigns scores based on the categories into which the ratings fall. In the fast-food restaurant project example, the respondent exhibits an unfavorable attitude toward McDonald's. These scores are typically treated as interval data. The advantage of continuous scales is that they are easy to construct. However, scoring is cumbersome and unreliable. Continuous scales also provide little new information. Hence, their use in marketing research has been limited. Recently, however, with the increased popularity of computer-assisted personal interviewing, Internet surveys, and other technologies, their use is becoming more frequent.

B. **Itemized Rating Scales:** In an **itemized rating scale,** the respondents are provided with a scale that has a number or brief description associated with each category. The categories are ordered in terms of 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.

We first describe the commonly used itemized rating scales—the Likert, semantic differential, and Stapel scales and then examine variations in the use of itemized rating scales.

(i) Likert Scale Named after its developer, Rensis Likert, the **Likert scale** is widely used. This rating scale requires the respondents to indicate a degree of agreement or disagreement with each of a series of statements about the stimulus objects. Typically, each scale item (statement) has five response categories, ranging from "strongly disagree" to "strongly agree." We illustrate with a Likert scale for evaluating attitudes toward McDonald's.

Instructions Listed below are different opinions about McDonald's. Please indicate how strongly you agree or disagree with each by using the following scale and circling the appropriate number:

1 = Strongly disagree

2 = Disagree

3 = Neither agree nor disagree

4 = Agree

5 = Strongly agree

Statement	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
1. McDonald's sells high-quality food.		✓			
2. McDonald's has poor in-store service.		✓			
3. I like to eat in McDonald's.			✓		
4. McDonald's does not offer a good variety of menu items.				✓	
5. McDonald's is where America eats.	✓				
6. I do not like the advertising done by McDonald's.				✓	
7. McDonald's charges fair prices.		✓			

Note that some statements are positive (e.g., statement 1) in that they reflect positively on McDonald's, while others are negative (e.g., statement 2) and reflect negatively on McDonald's. There is a reason for having both positive and negative statements. This controls the tendency of some respondents, particularly those with very positive or very negative attitudes, to mark the right- or left-hand sides of the scale without reading the statements. To conduct the analysis, each statement is assigned a

numerical score, ranging from 1 to 5. (Sometimes each statement may be assigned a score ranging from “2 to +2.) The analysis can be conducted on an item-by-item basis (profile analysis), or a total (summated) score can be calculated for each respondent by summing across items (statements). Suppose the Likert scale in the fast-food restaurant example was used to measure attitudes toward McDonald’s as well as Burger King. Profile analysis would involve comparing the two restaurants in terms of the average respondent ratings for each item, such as quality of food, in-store service, variety of menu items, and so on. The summated approach is most frequently used; as a result, the Likert scale is also referred to as a summated scale. When using this approach to determine the total score for each respondent on each restaurant, it is important to use a consistent scoring procedure so that a high (or low) score consistently reflects a favorable response. This requires that the categories assigned to the negative statements by the respondents be scored by reversing the scale. Note that for a positive statement, an agreement reflects a favorable response, whereas for a negative statement, a disagreement represents a favorable response. Accordingly, a “strongly agree” response to a positive statement and a “strongly disagree” response to a negative statement would both receive scores of 5. In the scale shown above, if a higher score is to denote a more favourable attitude, the scoring of items 2, 4, and 6 will be reversed. The respondent in the fast-food restaurant project example has an attitude score of 16 (2 + 4 + 3 + 2 + 1 + 2 + 2). For the second statement, because it is negative, although the respondent has circled 2, the score assigned is 4. Likewise, the circled numbers for statements 4 and 6 are also reversed. Each respondent’s total score for each restaurant is calculated. Note that across seven items, the total scores will be in a range from 7 to 35. A respondent with the highest total score will have the most favorable attitude toward McDonald’s, whereas a respondent with the lowest total score will have the least favorable attitude toward McDonald’s.

The Likert scale has several advantages. It is easy to construct and administer. Respondents readily understand how to use the scale, making it suitable for mail, telephone, electronic, or personal interviews. The major

disadvantage of the Likert scale is that it takes longer to complete than other itemized rating scales because respondents have to read each statement (or the interviewer has to read each statement to them). The following example shows another use of a Likert scale in marketing research.

(ii) Semantic Differential Scale : The semantic differential scale is a 7-point rating scale with end points associated with bipolar labels or descriptors. In a typical application, respondents rate objects on a number of itemized, 7-point rating scales bounded or anchored at each end by one of two bipolar adjectives, such as *cold* and *warm*. Individual items on a semantic differential scale may be scored on either a "3 to +3 or a 1 to 7 scale. The resulting data are commonly analyzed through profile analysis. In profile analysis, mean values on each rating scale are calculated and compared by plotting or by statistical analysis. This helps determine the overall differences and similarities among the objects. To assess differences across segments of respondents, the researcher can compare mean responses of different segments. On the other hand, in cases when the researcher requires an overall comparison of objects, such as determining restaurant preference, the individual item scores are added to arrive at a total score, as already illustrated for the Likert scale.

Its versatility makes the semantic differential a popular rating scale in marketing research. It has been widely used in comparing brand, product, and company images. It has also been used to develop advertising and promotion strategies and in new product development studies. Several modifications of the basic scale have been proposed.

(iii) Stapel Scale: The, named after its developer, Jan Stapel, is a unipolar rating scale with ten categories numbered from "5 to +5, without a neutral point (0). This scale is usually presented vertically. Respondents are asked to indicate how accurately or inaccurately each term describes the object by selecting an appropriate numerical response category. The higher the number, the more accurately the term describes the object, as shown in the McDonald's example. In

this example, McDonald's is evaluated as not having high-quality food and having somewhat poor service. The data obtained by using a Stapel scale can be analyzed in the same way as Likert or semantic differential data. The Stapel scale produces results similar to the semantic differential scale. The Stapel scale's advantages are that it does not require a pretest of the adjectives or phrases to ensure true bipolarity, and it can be administered over the telephone. However, some researchers believe the Stapel scale is confusing and difficult to apply. Of the three itemized rating scales considered, the Stapel scale is used least. However, this scale merits more attention than it has received.



CHECK YOUR PROGRESS

Q.6: What are the different types of Non Comparative Scaling Techniques?

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Basic Non Comparitive Scales

Scale	Basic Characteristics	Examples	Advantages	Disadvantages
Continuous Rating Scale	Place a mark on a continuous line	Reaction to TV commercials	Easy to construct	Scoring can be cumbersome unless computerized
Itemized Rating Scales				
Likert Scale	Degree of agreement on a 1 (strongly disagree) to 5 (strongly agree) scale	Measurement of attitudes	Easy to construct, administer, and understand	More time consuming
Semantic Differential	Seven-point scale with bipolar labels	Brand, product, and company images	Versatile	Difficult to construct bipolar adjectives
Stapel Scale	Unipolar ten-point scale, −5 to +5, without a neutral point (zero)	Measurement of attitudes and images	Easy to construct and administer over telephone	Confusing and difficult to apply

Table 6.3: Non- Comparitive Scales

MULTI-ITEM SCALES : Itemized rating scales discussed earlier form the basic components of multi-item rating scales. As the name implies, multi-item scales consist of multiple items that need to be evaluated in order to

obtain a given measurement. This was illustrated by the Likert scale measuring attitudes toward McDonald's that consisted of seven items. Likewise, the semantic differential and Stapel scales illustrated earlier in the context of McDonald's are also multi-item scales consisting of five and two items, respectively. The development of multi-item rating scales requires considerable technical expertise.

6.6 SCALE EVALUATION: MEASUREMENT ERROR

A multi-item scale should be evaluated for accuracy and applicability which would involves an assessment of reliability and validity of the scale. Both reliability and validity can be understood in terms of measurement, systematic, and random errors. **Measurement error** is the variation in the information sought by the researcher and the information generated by the measurement process employed. There are two sources of measurement error: systematic error and random error. **Systematic error** affects the measurement in a constant way. It represents stable factors that affect the observed score in the same way each time the measurement is made. Examples of systematic error are mechanical factors such as poor printing, overcrowding of items in the questionnaire, and poor design. **Random error**, on the other hand, is not constant. It represents transient factors that affect the observed score in different ways each time the measurement is made. Examples of random error are personal factors such as health, emotions, and fatigue. The distinction between systematic and random error is crucial to our understanding of reliability and validity.

6.7 CRITERIA FOR A GOOD MEASUREMENT

Reliability: Reliability refers to the extent to which a scale produces consistent results if repeated measurements are made. Systematic sources of error do not have an adverse impact on reliability because they affect measurement in a constant way and do not lead to inconsistency. In contrast, random error produces inconsistency, leading to lower reliability. Reliability can be defined as the extent to which a measure is free from random error.

If there is no random error, the measure is perfectly reliable. Reliability is assessed by determining the association between scores obtained from different administrations of the scale. If the association is high, the scale yields consistent results and is therefore reliable.

Validity: The validity of a scale may be defined as the extent to which differences in observed scale scores reflect true differences among objects on the characteristic being measured, rather than systematic or random error. Perfect validity requires that there be no measurement error, that is, no systematic error and no random error. Validity can be assessed by determining whether a scale performs as expected in relation to other selected variables. These variables may include demographic and psychographic characteristics, attitudinal and behavioral measures, or scores obtained from other scales. For example, a researcher may develop short forms of standard personality scales. The original scales and the short versions would be administered simultaneously to a group of respondents and the results compared to assess validity.

Relationship Between Reliability and Validity: The relationship between reliability and validity can be understood in terms of measurement error. If a measure is perfectly valid, it is also perfectly reliable. In this case, there is no measurement error. Thus, there is no systematic error and no random error. Thus, perfect validity implies perfect reliability. If a measure is unreliable, it cannot be perfectly valid because, at a minimum, random error is present. Systematic error may also be present. Thus, unreliability implies invalidity. If a measure is perfectly reliable, it may or may not be perfectly valid because systematic error may still be present, although random error is zero. While lack of reliability constitutes negative evidence for validity, reliability does not in itself imply validity. Reliability is a necessary but not sufficient condition for validity.



CHECK YOUR PROGRESS

Q.7: What is Measurement Error, Systematic Error and Random Error?

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Q.8: What is Reliability and Validity?

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6.8 LET US SUM UP

Measurement is the assignment of numbers or other symbols to characteristics of objects according to set rules. Scaling involves the generation of a continuum upon which measured objects are located. The four primary scales of measurement are nominal, ordinal, interval, and ratio. Of these, the nominal scale is the most basic in that the numbers are used only for identifying or classifying objects. In the ordinal scale, the next higher-level scale, the numbers indicate the relative position of the objects but not the magnitude of differences between them. The interval scale permits a comparison of the differences between the objects. Because it has an arbitrary 0 point, however, it is not meaningful to calculate ratios of scale values on an interval scale. The highest level of measurement is represented by the ratio scale in which the 0 point is fixed. The researcher can compute ratios of scale values using this scale. The ratio scale incorporates all the properties of the lower level scales.

Scaling techniques can be classified as comparative or noncomparative. Comparative scaling involves a direct comparison of stimulus objects. Comparative scales include paired comparisons, rank order, and constant sum. The data obtained by these procedures have only ordinal properties. In non comparative scaling, each object is scaled independently of the other objects in the stimulus set. The resulting data are generally assumed to be interval or ratio scaled. Non comparative rating scales can be either continuous or itemized. The itemized rating scales are further classified as Likert, semantic differential, or Stapel scales. Several variations of the original itemized scales are commonly used in marketing research.

Multi-item scales consist of a number of rating scale items. These scales should be evaluated in terms of reliability and validity. Reliability is the extent to which the measure is free from random error. Validity is the extent to which the measure is free from both random and systematic errors. The choice of particular scaling techniques in a given situation should be based on theoretical and practical considerations. As a general rule, the scaling technique used should be the one that will yield the highest level of information feasible. Also, multiple measures should be obtained.

Respondents in many developed countries, because of higher education and consumer sophistication levels, are quite used to providing responses on interval and ratio scales. In developing countries, however, preferences can be measured best by using ordinal scales. Special attention should be devoted to determining equivalent verbal descriptors in different languages and cultures.



6.9 FURTHER READING

1. Malhotra, N.K. and Dash, S. (2011). *Marketing research: An Applied Orientation* (6th edition), New Delhi: Pearson Education.



6.10 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q1: Measurement means assigning numbers or other symbols to characteristics of objects according to certain set rules. Scaling may be considered an extension of measurement. Scaling involves creating a continuum upon which measured objects are located.

Ans to Q2. There are four primary scales of measurement: nominal, ordinal, interval, and ratio

Ans to Q3. (i) A Nominal scale is a figurative labeling scheme in which the numbers serve only as labels or tags for identifying and classifying objects.

(ii) In an interval scale, numerically equal distances on the scale represent equal values in the characteristic being measured.

(iii) 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 characteristic.

(iv) A ratio scale possesses all the properties of the nominal, ordinal, and interval scales, plus an absolute 0 point. Thus, the ratio scale represents the highest level of measurement conveying the most information.

Ans to Q4. **Comparative scales** involve the direct comparison of two or more objects; objects are evaluated in relation to other objects in the stimulus set. In **non comparative scales,** also referred to as monadic or metric scales, objects are evaluated independently of each other. The resulting data are generally assumed to be interval scale.

Ans to Q5. Types of Comparitive Scaling techniques:

a. Paired Comparison Scaling b. Rank Order Scaling

Ans to Q6. Types of Non Comparative Scaling Techniques:

a. Continuous Rating Scale b. Itemised Rating Scale

Ans to Q7. **Measurement error** is the variation in the information sought by the researcher and the information generated by the measurement process employed.

Systematic error affects the measurement in a constant way. It represents stable factors that affect the observeds score in the same way each time the measurement is made.

Random error, on the other hand, is not constant. It represents transient factors that affect the observed score in different ways each time the measurement is made.

Ans to Q8: **Reliability** refers to the extent to which a scale produces consistent results if repeated measurements are made.

The **validity** of a scale may be defined as the extent to which differences in observed scale scores reflect true differences among objects on the characteristic being measured, rather than systematic or random error.



6.11 MODEL QUESTIONS

Q.1: What is measurement?

Q.2: What are the primary scales of measurement?

Q.3: Describe the differences between a nominal and an ordinal scale.

Q.4: What are the implications of having an arbitrary 0 point in an interval scale?

Q.5: What are the advantages of a ratio scale over an interval scale? Are these advantages significant?

Q.6: What is a comparative rating scale?

Q.7: What is a paired comparison?

Q.8: What are some advantages of rank-order scaling over paired comparison scaling?

Q.9: What is a semantic differential scale? For what purposes is this scale used?

Q.10: Describe the Stapel scale.

Q.11: Briefly explain itemized rating scales and how they differ from the continuous rating scale.

Q.12: Discuss the use of social media in implementing itemized rating scales.

Q.13: Briefly explain the two types of measurement errors.

Q.14: What is reliability?

Q.15: What is validity?

Q.16: What is the relationship between reliability and validity?

Q.17: How would you select a particular scaling technique?

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UNIT 7: SAMPLING

UNIT STRUCTURE

7.1 Learning Objectives

7.2 Introduction

7.3 Sampling Concepts

7.4 Sampling Error and Non Sampling Error

7.5 Sampling Design Process

7.6 Non- Probabilistic and Probabilistic Sampling Technique

7.6.1 Non- Probabilistic Sampling Technique

7.6.2 Probabilistic Sampling Technique

7.7 Determination of Sample Size

7.8 Let Us Sum Up

7.9 Further Reading

7.10 Answers to Check your progress

7.11 Model Questions

7.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- differentiate a sample from a census and identify the conditions that favour the use of a sample versus a census.
- discuss the sampling design process
- classify sampling techniques as non probability and probability sampling techniques.
- describe the non probability sampling techniques of convenience, judgmental, quota, and snowball sampling.
- describe the probability sampling techniques of simple random, systematic, stratified, and cluster sampling.
- learn the determination of the Sample Size in a Research Project.
- discuss the Means and Proportions method for determination of Sample Size.

7.2 INTRODUCTION

This chapter introduces the fundamental concepts of sampling and the qualitative considerations necessary to answer these questions. We address the question of whether or not to sample and describe the steps involved in sampling. Next, we present non probability and probability sampling techniques. We discuss the method of how to determine the sample size in the research process.

7.3 SAMPLING CONCEPTS

Sampling is one of the components of a research design. The formulation of the research design is the third step of the marketing research process. At this stage, the information needed to address the marketing research problem has been identified and the nature of the research design (exploratory, descriptive, or causal) has been determined. Furthermore, the scaling and measurement procedures have been specified, and the questionnaire has been designed. The next step is to design suitable sampling procedures. Sampling design involves several basic questions:

(1) Should a sample be taken? (2) If so, what process should be followed? (3) What kind of sample should be taken? And (4) How large should it be?

7.4 SAMPLING ERROR AND NON-SAMPLING ERROR

A **population** is the total of all the elements that share some common set of characteristics. Each marketing research project has a uniquely defined population. The objective of most marketing research projects is to obtain information about the characteristics of a population, for example, the proportion of consumers loyal to a particular brand of toothpaste. The researcher can obtain information about population characteristics by taking either a census or a sample. A **census** involves a complete count of all elements in a population. A **sample** is a subgroup of the population selected for the marketing research project.

Budget and time limits are obvious constraints favouring the use of a sample. A census is both costly and time-consuming to conduct. A census is unrealistic if the population is large, as it is for most consumer products. In the case of many industrial products, however, the population is small, thus making a census feasible as well as desirable. For example, in investigating the use of certain machine tools by automobile manufacturers, a census would be preferred to a sample. Another reason for preferring a census in this case is that variance, or variability, in the characteristic of interest is large. For example, machine tool usage at Ford will vary greatly from the usage at Honda. Small population sizes as well as high variance in the characteristic to be measured favour a census.

If the cost of sampling errors is high (e.g., if the sample omitted a major manufacturer like Ford, the results could be misleading), a census, which eliminates such errors, is desirable. **Sampling errors** are errors resulting from the particular sample selected being an imperfect representation of the population of interest. **Non Sampling errors,** on the other hand, can be attributed to sources other than sampling. They result from a variety of causes, including errors in problem definition, approach, scaling, questionnaire design, survey methods, interviewing techniques, and data preparation and analysis. The high cost of non sampling errors (e.g., interviewing errors because of lack of supervision), on the other hand, would favour sampling. A census can greatly increase non sampling errors to the point that these errors exceed the sampling errors of a sample. Non sampling errors are found to be the major contributor to total error, whereas random sampling errors have been relatively small in magnitude. Hence, in most cases involving large populations, accuracy considerations would favour a sample over a census. This is one of the reasons that the Bureau of the Census checks the accuracy of various censuses by conducting sample surveys. However, it is not always possible to reduce non sampling error sufficiently to compensate for sampling error, as would be the case in a study involving automobile manufacturers In general, in marketing research projects dealing with consumers or households, a census is not feasible and a sample should be taken. However, in many business- to-

business or industrial marketing situations where the population size is small, a census is feasible as well as desirable.



CHECK YOUR PROGRESS

Q.1: Define Population and Sample

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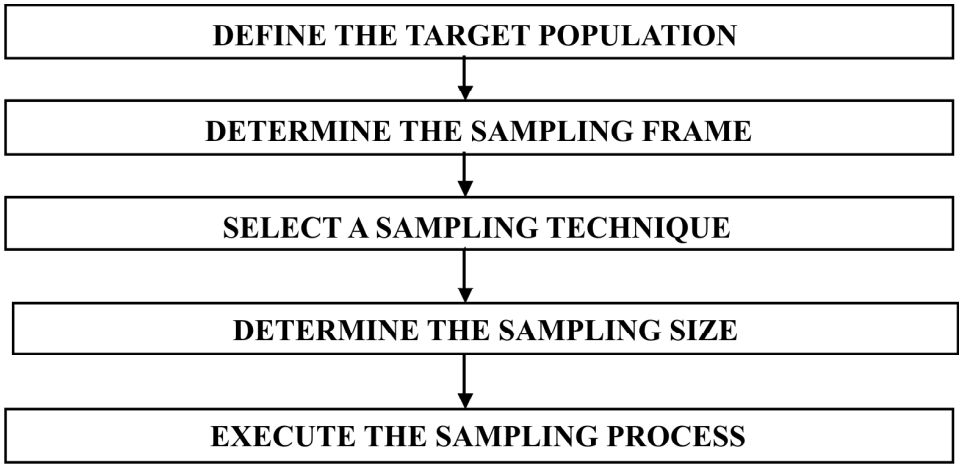
Q.2: What are Sampling Errors and Non Sampling Errors ?

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7.5 SAMPLING DESIGN PROCESS

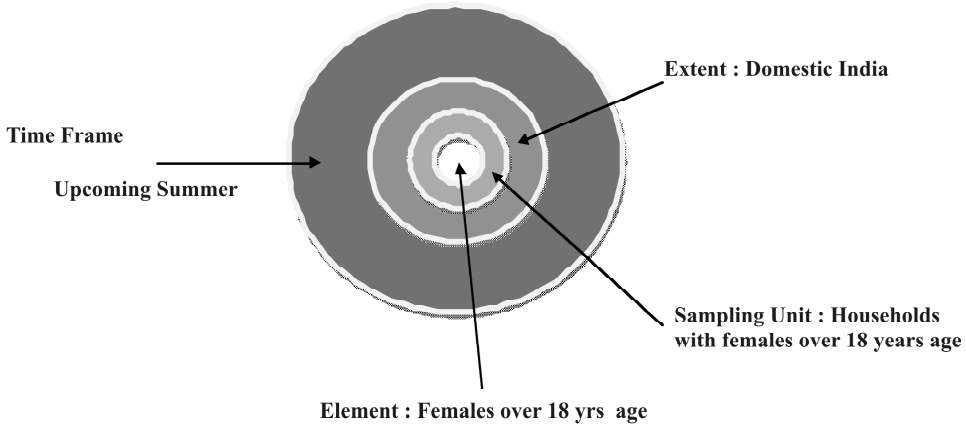
The sampling design process includes five steps, which are shown sequentially in the figure below. These steps are closely interrelated and relevant to all aspects of the marketing research project, from problem definition to the presentation of the results. Therefore, sample design decisions should be integrated with all other decisions in a research project.



1. **Define the Target Population:** Sampling design begins by specifying the target population. The **target population** is the collection of elements or objects that possesses the information sought by the researcher and about which inferences are to be made. Inference involves projection or generalization of the sample results to the target population, as illustrated in the section entitled Classification of

Sampling Techniques. The target population must be defined precisely. Imprecise definition of the target population will result in research that is ineffective at best and misleading at worst. Defining the target population involves translating the problem definition into a precise statement of who should and should not be included in the sample.

The target population should be defined in terms of elements***, sampling units, extent, and time***. An **element** is the object about which or from which the information is desired. In survey research, the element is usually the respondent. A **sampling unit** is an element, or a unit containing the element, that is available for selection at some stage of the sampling process, for example, a household. Suppose that Revlon wanted to assess consumer responses to a new line of lipsticks and wanted to sample females over 18 years of age. It may be possible to sample females over the age of 18 directly, in which case a sampling unit would be the same as an element. Alternatively, the sampling unit might be households. In the latter case, households would be sampled and all females over age 18 in each selected household would be interviewed or one selected from each sampled household, for example, by using the next birthday method. Here, the sampling unit and the population element are different. ***Extent*** refers to the geographical boundaries, and the ***time*** frame is the time period under consideration. Defining the target population is illustrated in the figure below.



2. **Determine the Sampling Frame:** A **sampling frame** is a representation of the elements of the target population. It consists of a list or set of directions for identifying the target population. Examples of a sampling frame include the telephone book, an association

directory listing the firms in an industry, a mailing list purchased from a commercial organization, a city directory, or a map. If a list cannot be compiled, then at least some directions for identifying the target population should be specified, such as random digit dialing procedures in telephone surveys. Often it is possible to compile or obtain a list of population elements, but the list may omit some elements of the population or include other elements that do not belong. Therefore, the use of a list will lead to sampling frame error. In some instances, the discrepancy between the population and the sampling frame is small enough to ignore. In most cases, however, the researcher should recognize and treat the sampling frame error.

3. **Select a Sampling Technique:** The most important decision about the choice of sampling technique is whether to use probability or non probability sampling. Given the importance of this decision, the issues involved are discussed in great detail later in this unit. If the sampling unit is different from the element, it is necessary to specify precisely how the elements within the sampling unit should be selected. In in-home personal interviews and telephone interviews, merely specifying the address or the telephone number may not be sufficient. For example, should the person answering the doorbell or the telephone be interviewed, or someone else in the household? Often, more than one person in a household may qualify. For example, both the male and female head of household may be eligible to participate in a study examining family leisure activities. When a probability sampling technique is being employed, a random selection must be made from all the eligible persons in each household. A simple procedure for random selection is the next birthday method.
4. **Determine the Sample size:** Sample size refers to the number of elements to be included in the study. Determining the sample size is complex and involves several qualitative and statistical considerations. Important qualitative factors that should be considered in determining the sample size include (1) the importance of the decision, (2) the nature of the research, (3) the nature of the analysis, (4) sample sizes used in similar studies, and (5) resource constraints.

In general, for more important decisions, more information is necessary and the information should be obtained more precisely. This calls for larger samples, but as the sample size increases, each unit of information is obtained at greater cost and less benefit. The nature of the research also has an impact on the sample size. For exploratory research designs, such as those using qualitative research, the sample size is typically small. For conclusive research, such as descriptive surveys, larger samples are required. If sophisticated analysis of the data using advanced statistical techniques is required, the sample size should be large. The same applies if the data are to be analyzed in great detail. Thus, a larger sample would be required if the data are being analyzed at the subgroup or segment level than if the analysis is limited to the aggregate or total sample. Sample size is influenced by the average size of samples in similar studies. Table 6.1 gives an idea of sample sizes used in different marketing research studies. These sample sizes have been determined based on experience and can serve as rough guidelines, particularly when non probability sampling techniques are used.

The sample size decision should be guided by a consideration of the resource constraints. In any marketing research project, money and time are limited. Other constraints include the availability of qualified personnel for data collection. Based on all the foregoing considerations, the sample size in a research project was determined to be 1,000. The statistical considerations involve the variability (variance) of the characteristic being measured and other considerations. Statistically, a sample of 400 (385 to be more precise) is sufficient to yield estimates of percentages that meet commonly acceptable statistical standards.

Table 7.1 Sample Sizes Used in Marketing Research Studies

Type of Study	Minimum Size	Typical Range
• Problem-identification research (e.g., market potential)	500	1,000–2,500
• Problem-solving research (e.g., pricing)	200	300–500
• Product tests	200	300–500
• Test marketing studies	200	300–500
• TV/radio/print advertising (per commercial or ad tested)	150	200–300
• Test-market audits	10 stores	10–20 stores
• Focus groups	2 groups	10–15 groups

Execute the Sampling Process

Execution of the sampling process requires a detailed specification of how the sampling design decisions with respect to the population, sampling frame, sampling unit, sampling technique, and sample size are to be implemented. If households are the sampling units, an operational definition of a household is needed. Procedures should be specified for vacant housing units and for call backs in case no one is at home. Detailed information must be provided for all sampling design decisions.



CHECK YOUR PROGRESS

Q.3: What is a Sampling Unit ?

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Q.4: What is Sample Size?

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7.6 NON PROBABILISTIC & PROBABILISTIC SAMPLING TECHNIQUES

Sampling techniques may be broadly classified as non probability and probability.

Non probability sampling relies on the personal judgment of the researcher rather than chance to select sample elements. The researcher can arbitrarily or consciously decide what elements to include in the sample. Non probability samples may yield good estimates of the population characteristics. However, they do not allow for objective evaluation of the sampling errors. Because there is no way of determining the probability of selecting any particular element for inclusion in the sample, the estimates obtained are not statistically projectable to the population; that is, one cannot derive inferences about the population based on the sample results. Thus, if 35 percent of the people in a sample selected by non probability sampling express preference for a new service, we cannot conclude that 35 percent

of the target population will have the same preference. Commonly used non probability sampling techniques include –

- **Convenience Sampling,**
- **Judgmental Sampling,**
- **Quota Sampling and**
- **Snowball Sampling.**

In **probability sampling**, sampling units are selected by chance. Because sample elements are selected by chance, it is possible to determine the accuracy of the sample estimates of the characteristics of interest, for example, the percentage expressing preference for a new service. This permits the researcher to make inferences or projections about the target population from which the sample was drawn. Thus, if 35 percent of the people in a sample selected by probability sampling express preference for a new service, we can conclude that it is likely that 35 percent of the target population will have the same preference. Probability sampling techniques consist of –

- **Simple Random Sampling,**
- **Systematic Sampling,**
- **Stratified Sampling and**
- **Cluster Sampling.**



CHECK YOUR PROGRESS

Q.5: What are the different types of Probability and Non Probability Sampling Techniques ?

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7.6.1 Non-Probabilistic Sampling Techniques

1. **Convenience Sampling:** Convenience sampling attempts to obtain a sample of convenient elements. The selection of sampling units is left primarily to the interviewer. Often, respondents are selected because they happen to be in the right place at the right time. Examples of convenience sampling

include (1) use of students, church groups, and members of social organizations; (2) mall-intercept interviews without qualifying the respondents; (3) department stores using charge account lists; and (4) "people on the street" interviews. 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 (that is, respondents can influence their selection or non selection). Convenience samples are not representative of any definable population. Hence, it is not meaningful to generalize the sample results to any population from a convenience sample, and convenience samples are not appropriate for marketing research projects involving population inferences. Convenience samples are not recommended for descriptive or causal research, but they can be used in exploratory research for generating ideas, insights, or hypotheses. 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.

2. **Judgmental Sampling:** Judgmental sampling is a form of convenience sampling in which the population elements are selected based on the judgment of the researcher. The researcher, exercising judgment or expertise, chooses the elements to be included in the sample because he or she believes that they are representative of the population of interest or are otherwise appropriate. Common examples of judgmental sampling include (1) test markets selected to determine the potential of a new product, (2) purchase engineers selected in industrial marketing research because they are considered to be representative of their respective companies, and (3) bellwether precincts selected in voting behavior research.

3. **Quota Sampling:** Quota sampling may be viewed as two-stage judgmental sampling. The first stage consists of developing control categories, or quotas, of population elements. To develop these quotas, the researcher lists relevant control characteristics and determines the distribution of these characteristics in the target population. The relevant control characteristics, which may include gender, age, and race, are identified on the basis of judgment. Often, the quotas are assigned so that the proportion of the sample elements possessing the control characteristics is the same as the proportion of population elements with these characteristics. In other words, the quotas ensure that the composition of the sample is the same as the composition of the population with respect to the characteristics of interest. In the second stage, sample elements are selected based on convenience or judgment. Once the quotas have been assigned, there is considerable freedom in selecting the elements to be included in the sample. The only requirement is that the elements selected fit the control characteristics.

   Even if the sample composition mirrors that of the population with respect to the control characteristics, there is no assurance that the sample is representative. If a characteristic that is relevant to the problem is overlooked, the quota sample will not be representative. Relevant control characteristics are often omitted because practical difficulties are associated with trying to include many control characteristics. Because the elements within each quota are selected based on convenience or judgment, many sources of selection bias are potentially present. The interviewers may choose to go to selected areas where eligible respondents are more likely to be found. They may avoid people who look unfriendly or are not well dressed, or those who live in undesirable locations. Quota sampling does not permit assessment of sampling error. Quota sampling attempts to obtain representative samples at a relatively low cost. Its

advantages are the lower costs and greater convenience to the interviewers in selecting elements for each quota. Recently, tighter controls have been imposed on interviewers and interviewing procedures that tend to reduce selection bias, and guidelines have been suggested for improving the quality of mall-intercept quota samples. Under certain conditions, quota sampling obtains results close to those for conventional probability sampling.

4. **Snowball Sampling :** In snowball sampling, an initial group of respondents is selected, usually at random. After being interviewed, these respondents are asked to identify others who belong to the target population of interest. Subsequent respondents are selected based on the referrals. This process may be carried out in waves by obtaining referrals from referrals, thus leading to a snowball effect. Even though probability sampling is used to select the initial respondents, the final sample is a non probability sample. The referrals will have demographic and psychographic characteristics that are more similar to the persons referring them than would occur by chance.

   A major objective of snowball sampling is to estimate characteristics that are rare in the population. Examples include users of particular government or social services, such as food stamps, whose names cannot be revealed; special census groups, like widowed males under age 35; and members of a scattered minority population. Snowball sampling is used in industrial buyer–seller research to identify buyer–seller pairs. The major advantage of snowball sampling is that it substantially increases the likelihood of locating the desired characteristic in the population. It also results in relatively low sampling variance and costs.

7.6.2 Probabilistic Sampling Technique

Probability sampling techniques vary in terms of sampling efficiency. Sampling - efficiency reflects a trade-off between sampling cost and precision. Precision refers to the level of uncertainty about the characteristic being measured. Precision is inversely related to sampling errors but positively related to cost. The greater the precision, the lower the sampling errors and the greater the cost, and most studies require a trade-off. The researcher should strive for the most efficient sampling design, subject to the budget allocated. The efficiency of a probability sampling technique may be assessed by comparing it to that of simple random sampling.

1. **Simple Random Sampling:** In simple random sampling (SRS), each element in the population has a known and equal probability of selection, and every element is selected independently of every other element. The sample is drawn by a random procedure from a sampling frame. This method is equivalent to a lottery system in which names are placed in a container, the container is shaken, and the names of the winners are then drawn in an unbiased manner.

   To draw a simple random sample, the researcher first compiles a sampling frame in which each element is assigned a unique identification number. Then random numbers are generated to determine which elements to include in the sample. The random numbers may be generated with a computer routine or a table. This was illustrated in a Case where a computer program was used to randomly generate household telephone numbers. SRS has many desirable features. It is easy to understand. The sample results may be projected to the target population. Most approaches to statistical inference assume that the data have been collected by simple random sampling. However, SRS suffers from at least four significant limitations.

First, it is often difficult to construct a sampling frame that will permit a simple random sample to be drawn. **Second,** SRS can result in samples that are very large or spread over large geographic areas, thus increasing the time and cost of data collection. **Third,** SRS often results in lower precision than other probability sampling techniques. In fact, the efficiency of other probability sampling techniques is often assessed by comparing it to that of simple random sampling (SRS). **Fourth,** SRS may or may not result in a representative sample. Although samples drawn will represent the population well on average, a given simple random sample may grossly misrepresent the target population. This is more likely if the size of the sample is small. For these reasons, SRS is not widely used in marketing research. Procedures such as systematic sampling are more popular.

2. **Systematic Sampling:** In systematic sampling, the sample is chosen by selecting a random starting point and then picking every *i*th element in succession from the sampling frame. The sampling interval, *i*, is determined by dividing the population size *N* by the sample size *n* and rounding to the nearest integer. For example, there are 100,000 elements in the population, and a sample of 1,000 is desired. In this case, the sampling interval, *i*, is 100. A random number between 1 and 100 is selected. If this number is 23, for example, the sample consists of elements 23, 123, 223, 323, 423, 523, and so on.

   Systematic sampling is different from SRS in that only the initial element is selected randomly and the remaining elements are selected systematically, that is, by adding *i* to the previous element number. In SRS, all the elements are selected randomly.

   For systematic sampling, the researcher assumes that the population elements are ordered in some respect. When the ordering of the elements is related to the characteristic of interest, systematic sampling increases the representativeness of the sample. If firms in an industry are arranged in increasing order

of annual sales, a systematic sample will include some small and some large firms. A simple random sample may be unrepresentative because it may contain, for example, only small firms or a disproportionate number of small firms. If the ordering of the elements produces a cyclical pattern, systematic sampling may decrease the representativeness of the sample. To illustrate, consider the use of systematic sampling to generate a sample of monthly department store sales from a sampling frame containing monthly sales for the last sixty years. If a sampling interval of 12 is chosen, the resulting sample would not reflect the month-to-month variation in sales. Let's say that a random number from 1 to 12 is selected, and let's say that 3 is the number selected, representing the month of March. Thus, the sample will consist of 3, 15 (3 + 12), 27 (3 + [2 × 12]), and the month of March will be selected for each of the sixty years. In this case, the monthly variation in sales for each year would not be reflected in the sample.

Systematic sampling is less costly and easier than SRS because random selection is done only once. The random numbers do not have to be matched with individual elements, as in SRS. Another relative advantage is that systematic sampling can even be used without knowledge of the composition (elements) of the sampling frame. For example, every *i*th 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

Stratified Sampling: Stratified sampling is a two-step process in which the population is first partitioned into subpopulations, or strata. The strata should be mutually exclusive and collectively exhaustive in that every population element should be assigned to one and only one stratum and no population elements should be omitted. Next, elements are selected from each stratum by a random procedure, usually simple random sampling (SRS). Technically, only SRS

should be employed in selecting the elements from each stratum. In practice, sometimes systematic sampling and other probability sampling procedures are employed. Stratified sampling differs from quota sampling in that the sample elements are selected probabilistically rather than based on convenience or judgment. A major objective of stratified sampling is to increase precision without increasing cost.

The variables used to partition the population into strata are referred to as stratification variables. The criteria for the selection of these variables consist of homogeneity (similarity), heterogeneity (dissimilarity), relatedness, and cost. The elements within a stratum should be as homogeneous (similar) as possible, but the elements in different strata should be as heterogeneous (different) as possible. The stratification variables should also be closely related to the characteristic of interest. The more closely these criteria are met, the greater the effectiveness in controlling extraneous sampling variation. Finally, the variables should decrease the cost of the stratification process by being easy to measure and apply.

Variables commonly used for stratification include demographic characteristics (as illustrated in the example for quota sampling), type of customer (credit card versus non–credit card), size of firm, or type of industry. It is possible to use more than one variable for stratification, although more than two are seldom used because of pragmatic and cost considerations.

3. **Cluster Sampling:** In cluster sampling, the target population is first divided into mutually exclusive and collectively exhaustive subpopulations, or clusters. Then a random sample of clusters is selected, based on a probability sampling technique such as simple random sampling. For each selected cluster, either all the elements are included in the sample or a sample of elements is drawn probabilistically. If all the elements in each selected cluster are included in the sample, the procedure is called one-stage cluster sampling. If a sample of elements is drawn

probabilistically from each selected cluster, the procedure is two-stage cluster sampling.

The key distinction between cluster sampling and stratified sampling is that, in cluster sampling, only a sample of subpopulations (clusters) is chosen, whereas in stratified sampling, all the subpopulations (strata) are selected for further sampling. The objectives of the two methods are also different. The objective of cluster sampling is to increase sampling efficiency by decreasing costs. The objective of stratified sampling is to increase precision. With respect to homogeneity and heterogeneity, the criteria for forming clusters are just the opposite of that for strata. Elements within a cluster should be as heterogeneous (different) as possible, but clusters themselves should be as homogeneous (similar) as possible. Ideally, each cluster should be a small-scale representation of the population. In cluster sampling, a sampling frame is needed only for those clusters selected for the sample. A common form of cluster sampling is area sampling, in which the clusters consist of geographic areas, such as counties, housing tracts, or blocks.



CHECK YOUR PROGRESS

Q.6: Write note on Convenience Sampling and Snowball Sampling

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Q.7: Discuss about Simple Random Sampling and Cluster Sampling

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7.7 DETERMINATION OF SAMPLE SIZE

Sample Size determination is computed using three inputs:

- The estimate of the population standard deviation (often obtained from earlier studies).
- The acceptable level of sampling error
- The desired confidence level

Generally, research practitioners utilize the following sequence and inputs in computing sample size:

1. Survey respondents will split 50/50 in response to dichotomous (e.g. yes/no) questions.
2. The desired level of confidence will be 95%, or 1.96 standard deviations from the mean or .05 possible

Py = Proportion responding "yes"

Pn = Proportion responding "no"

Standard error is the acceptable amount of error/confidence interval. Let us consider it as .05/1.96 (about 2 standard deviations), or .0255102.

The standard formula for computing the sample size is:

$$\frac{(Py)\,(Pn)}{\text{Std Error}^2}$$

So, when the respective values are input, we end up with .25/.0006507 or 384 respondents. This is why a survey sample size of 400 is often recommended.

Sample size is important in avoiding Type I or Type II errors.

Type I errors are made by stating that there is a difference between two groups within a population on a given measurement, when in fact there is no difference. Accommodating this potential outcome is where most sample size calculations stop. Often, practitioners simply ignore the possibility of making a Type II error.

The sample size typically needed to address Type I errors is 384.

Type II errors are made by stating that there is no difference between two groups within a population on a given measurement, when in fact there is a difference. While important, many researchers ignore statistical power calculations. In the "real world" tables and canned statistical tools are utilized to determine survey power, due to the complexity of the formulas.

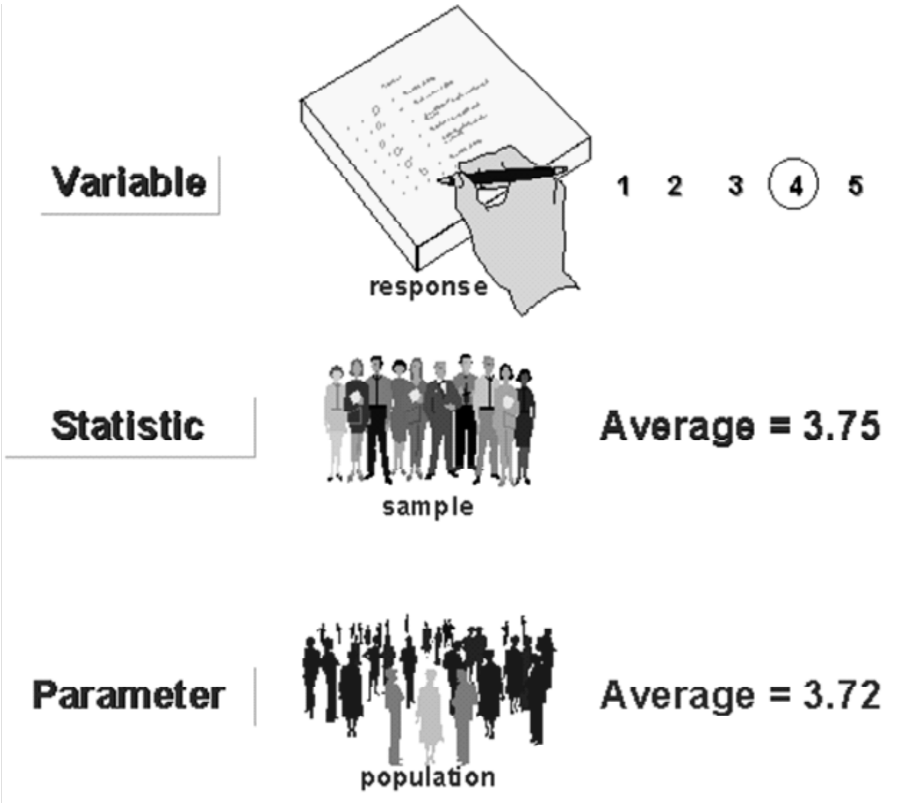
The sample size typically needed to address Type II errors is 1,236.

Confidence level suggests that other samples drawn from the same population will have similar values X% of the time. For most marketing research exercises, confidence levels are set at 95%.

Confidence interval includes the possible end point values for the entire population. The confidence interval allows for a computed amount of variation from the mean value based on the precision/cost value trade-off.

Sampling Error :Any characteristic of the population related measure is called a parameter. It is a fixed value as long as the population does not change.

The picture shows population. Say it includes 1000 people and the average of their response is 3.72. It is known as population mean –a parameter.



The picture also shows a sample. Let us say, it consists of 100 people. The sample mean is 3.75 and it is called a statistic. The difference between the statistic and the parameter is called sampling error. Each sample will generate a different amount of sampling error. In this case it is 3.75-3.72 = 0.03.

Sampling Distribution of Mean: The distribution of responses of sample elements form a sampling distribution with a mean and variations. To understand, let us to do an exercise. Imagine the population of 5 elements say [1, 2, 3, 4, 5]. The mean value of the population = [1+2+3+4+5]/5 =3

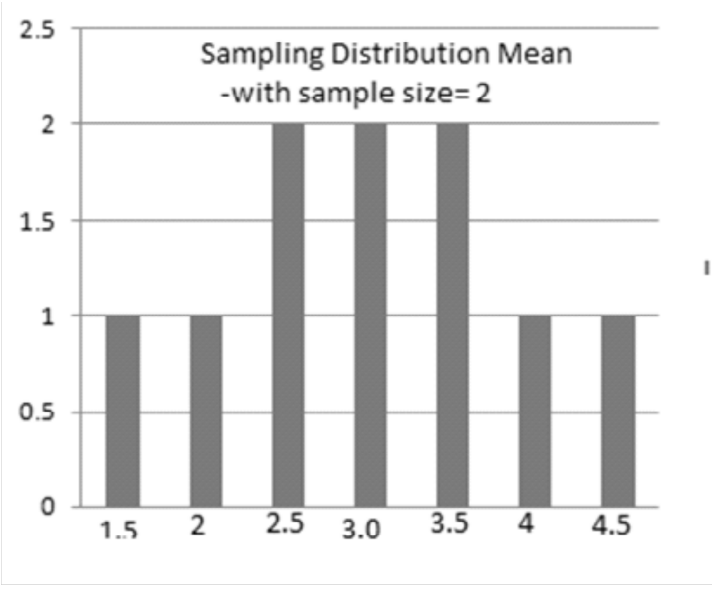
Let us assume that you have taken sample sizes of 2, 3 and 4.

Sample Size -2 units

For the sample size of 2, you know that a maximum of 10 possible unique samples can be selected [5C2 = 5 *4 /1 * 2 = 10]. If you look at a glance of this distribution of sampling means, it is varying from 1.5 to 4.5.

SL.NO	SAMPLE ELEMENTS	MEAN OF THE SAMPLE
1	1,2	1.5
2	1,3	2
3	1,4	2.5
4	1,5	3
5	2,3	2.5
6	2,4	3
7	2,5	3.5
8	3,4	3.5
9	3,5	4
10	4,5	4.5

Distribution of Sampling Means for a sample size 2

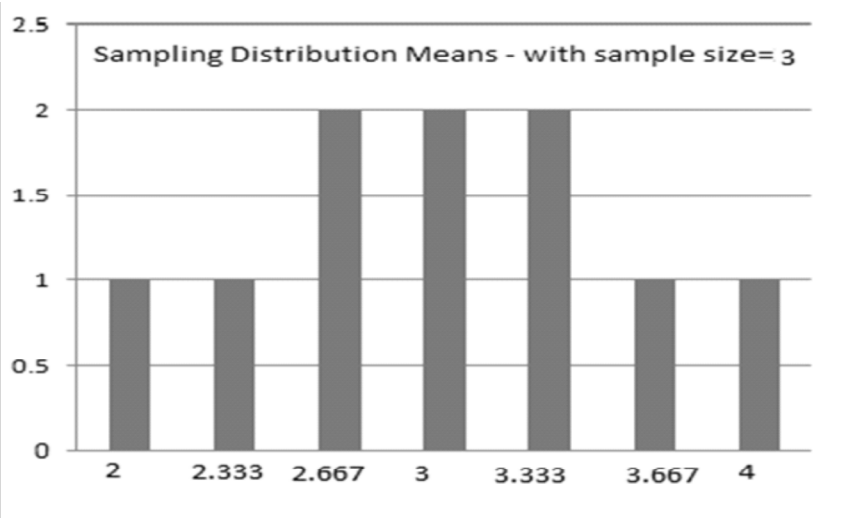


Sample Size of 3

A maximum of 10 possible unique samples can be selected [5C3 = (5 * 4 * 3) / (1*2*3) = 10]. If you look at a glance of this distribution of sampling means, it is varying from 2.0 to 4.0

SL.NO	SAMPLE ELEMENTS	MEAN OF THE SAMPLE
1	1,2,3	2
2	1,2,4	2.3333
3	1.2.5	2.6666
4	1,,3,4	2.666
5	1,3,5	3
6	1,4,5	3.3333
7	2,3,4	3
8	2,3,5	3.3333
9	2,4,5	3.666
10	3,4,5	4

Distribution of Sampling Means for a sample size 3

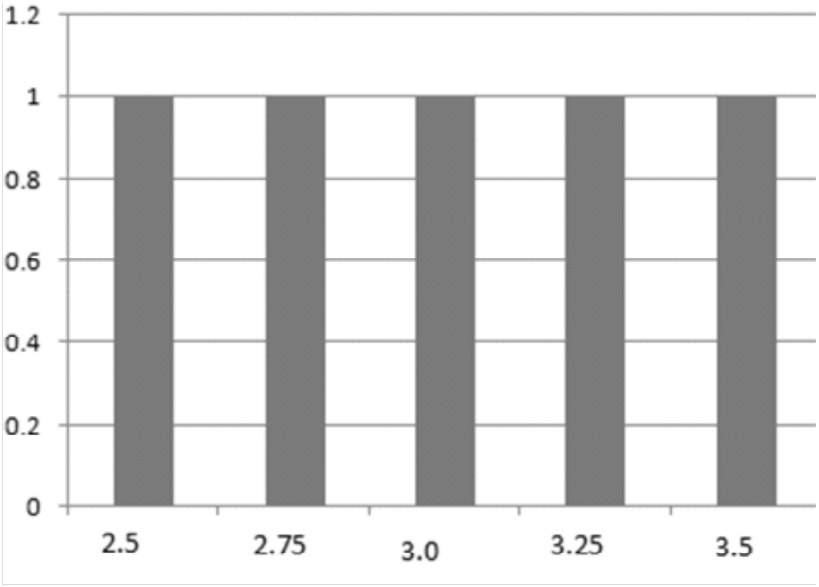


Sample Size of 4

A maximum of 5 possible unique samples can be selected [5C4 = (5 * 4 * 3 * 2) / (1*2*3*4) = 5]. If you look at a glance of this distribution of sampling means, it is varying from 2.5 to 3.5.

SL.NO	SAMPLE ELEMENTS	MEAN OF THE SAMPLE
1	1,2,3,4	2.5
2	1,2,4,5	3
3	1.3.4.5	3.25
4	1,2,3,5	2.75
5	2,3,4,5	3.5

Distribution of Sampling Means for a sample size 3



In each case the average of means is equal to 3. Therefore we can say, for a finite population, different sample may or may not have mean equal to population. But the mean of the distribution will be equal to population mean. The standard deviation of each of these samples represents the distribution of potential sampling error, which in statistical terminology is known as standard error.

Even though all three samples came from the same population, you would not expect to get the exact same statistic from each. They would differ marginally just due to the random “luck of the draw” or to the natural fluctuations or vagaries of drawing a sample. But you would expect that all three samples would yield a similar statistical estimate because they were drawn from the same population.

Now, if we extend the same logic to an infinite number of samples from a population, which consist of 1000s of members. Even for a sample size of 100, [1000C100 = you can calculate...] countable samples [of course in millions] can be drawn, which is theoretically possible to do and if we compute the average for each one.

If you plotted them on a histogram or bar graph you should find that most of them converge on the same central value and that you get fewer and fewer samples that have averages farther away up or down from that central value. In other words, the bar graph would be well described by the bell curve shape that is an indication of a “normal” distribution in statistics.

The distribution of an infinite number of samples of the same size as the sample in your study is known as the sampling distribution of means.



7.8 LET US SUM UP

Sampling is preferred when the cost of sampling error is low, and the cost of non sampling error is high. The opposite set of conditions favor the use of a census. Sampling design begins by defining the target population in terms of elements, sampling units, extent, and time. Then the sampling frame should be determined. A sampling frame is a representation of the elements of the target population. It consists of a list or directions for identifying the target population. At this stage, it is important to recognize any sampling frame errors that may exist. The next step involves selecting a sampling technique and determining the sample size. In addition to quantitative analysis, several qualitative considerations should be taken into account in determining the sample size. Finally, execution of the sampling process requires detailed specifications for each step in the sampling process.

Sampling techniques may be classified as non probability and probability techniques. Non probability sampling techniques rely on the researcher's judgment. Consequently, they do not permit an objective evaluation of the precision of the sample results, and the estimates obtained are not statistically projectable to the population. The commonly used non probability sampling techniques include convenience sampling, judgmental sampling, quota sampling, and snowball sampling.

In probability sampling techniques, sampling units are selected by chance. Each sampling unit has a nonzero chance of being selected. It is also possible to determine the precision of the sample estimates and to make projections to the target population. Probability sampling techniques include simple random sampling, systematic sampling, stratified sampling, and cluster sampling. The choice between probability and non probability sampling should be based on the nature of the research, relative magnitude of sampling and non sampling errors, and statistical and operational considerations.



7.9 FURTHER READING

1. Malhotra, N.K. and Dash, S. (2011). *Marketing research: An Applied Orientation* (6th edition), New Delhi: Pearson Education.



7.10 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q1: A **population** is the total of all the elements that share some common set of characteristics. A **sample** is a subgroup of the population selected for the marketing research project.

Ans to Q2: **Sampling errors** are errors resulting from the particular sample selected being an imperfect representation of the population of interest. **Non Sampling errors,** on the other hand, can be attributed to sources other than sampling.

Ans to Q3: A **sampling unit** is an element, or a unit containing the element, that is available for selection at some stage of the sampling process

Ans to Q4: Sample size refers to the number of elements to be included in the study.Important qualitative factors that should be considered in determining the sample size include (1) the importance of the decision, (2) the nature of the research, (3) the nature of the analysis, (4) sample sizes used in similar studies, and (5) resource constraints.

Ans to Q5: Probability sampling techniques consist of :Simple Random Sampling, Systematic Sampling, Stratified Sampling, and Cluster Sampling.

Non probability sampling techniques include:Convenience Sampling, Judgmental Sampling, Quota Sampling and Snowball Sampling.

Ans to Q6: Convenience sampling attempts to obtain a sample of convenient elements. The selection of sampling units is left

primarily to the interviewer. Often, respondents are selected because they happen to be in the right place at the right time. In snowball sampling, an initial group of respondents is selected, usually at random. After being interviewed, these respondents are asked to identify others who belong to the target population of interest.

Ans to Q7: In simple random sampling (SRS), each element in the population has a known and equal probability of selection, and every element is selected independently of every other element.

In **cluster sampling**, the target population is first divided into mutually exclusive and collectively exhaustive subpopulations, or clusters.



7.11 MODEL QUESTIONS

Q.1: What is the major difference between a sample and a census?

Q.2: Under what conditions would a sample be preferable to a census? A census preferable to a sample?

Q.3: Describe the sampling design process.

Q.4: How should the target population be defined?

Q.5: What is a sampling unit? How is it different from the population element?

Q.6: What qualitative factors should be considered in determining the sample size?

Q.7: What are the disadvantages of non probability sampling techniques?

Q.8: What is the least expensive and least time-consuming of all sampling techniques? What are the major limitations of this technique?

Q.9: What are the advantages and disadvantages of judgmental sampling?

Q.10: What is the relationship between quota sampling and judgmental sampling?

Q.11: What are the distinguishing features of simple random sampling?

Q.12: Describe the procedure for selecting a systematic random sample.

Q.13: Describe stratified sampling. What are the criteria for the selection of stratification variables?

Q.14: What is the major advantage of snowball sampling?

Q.15: Discuss the method of determining the sample size using means and proportions.

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UNIT 8: QUESTIONNAIRE DESIGN

UNIT STRUCTURE

8.1 Learning Objectives

8.2 Introduction

8.3 Questionnaire Method

8.4 Questionnaire Design Process

8.5 Let Us Sum Up

8.6 Further Reading

8.7 Answers to Check your progress

8.8 Model Questions

8.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- explain the purpose of a questionnaire and its objectives.
- describe the process of designing a questionnaire, the steps involved, and the guidelines that must be followed at each step.
- discuss the observational form of data collection.
- discuss the use of software for designing questionnaires.
- explain the considerations involved in designing questionnaires for international marketing research.
- explain how social media interface with questionnaire design.
- learn the ethical issues involved in questionnaire design.

8.2 INTRODUCTION

Questionnaire or form design is an important step in formulating a research design. Once the researcher has specified the nature of the research design and determined the scaling procedures, a questionnaire or an observational form can be developed. This chapter discusses the importance of questionnaires and observational forms. Next, we describe the objectives of a questionnaire and the steps involved in designing questionnaires. We provide several guidelines for developing sound

questionnaires. We also consider the design of observational forms. The considerations involved in designing questionnaires when conducting international marketing research and research in social media are discussed. Several ethical issues that arise in questionnaire design are identified.

8.3 QUESTIONNAIRE METHOD

As was discussed in earlier, survey and observation are the two basic methods for obtaining quantitative primary data in descriptive research. Both of these methods require some procedure for standardizing the data collection process so that the data obtained can be analyzed in a uniform and coherent manner. If forty different interviewers conduct personal interviews or make observations in different parts of the country, the data they collect will not be comparable unless the interviewers follow specific guidelines and ask questions and record answers in a standard way. A standardized questionnaire or form will serve this purpose, ensure comparability of the data, increase speed and accuracy of recording, and facilitate data processing.

Questionnaire Definition

A **questionnaire** is a formalized set of questions for obtaining information from respondents.

Typically, a questionnaire is only one element of a data collection package, which might also include (1) field work procedures, such as instructions for selecting, approaching, and questioning respondents ; (2) some reward, gift, or payment offered to respondents; and (3) communication aids, such as maps, pictures, advertisements, and products (in personal interviews) and return envelopes (in mail surveys). Regardless of the form of administration, a questionnaire is characterized by some specific objectives.

Objectives of a Questionnaire

Any questionnaire has three main objectives. **First**, it must translate the information needed into a set of specific questions that the respondents can and will answer, in other words, that the respondents are both able and willing to answer. Developing questions that respondents can and will answer and that will yield the desired information is difficult. Two apparently similar

ways of posing a question may yield different information. Hence, this objective is a challenge. **Second**, a questionnaire must uplift, motivate, and encourage the respondent to become involved in the interview, to cooperate, and to complete the interview. Incomplete interviews have limited usefulness at best. In designing a questionnaire, the researcher should strive to minimize respondent fatigue, boredom, incompleteness, and non response. A well-designed questionnaire can motivate the respondents and increase the response rate. **Third,** a questionnaire should minimize response error. **Response error** is the error that arises when respondents give inaccurate answers or their answers are misrecorded or misanalyzed. A questionnaire can be a major source of response error. Minimizing this error is an important objective of questionnaire design.



CHECK YOUR PROGRESS

Q.1: Define a Questionnaire.

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Q.2: What are the objectives of a Questionnaire ?

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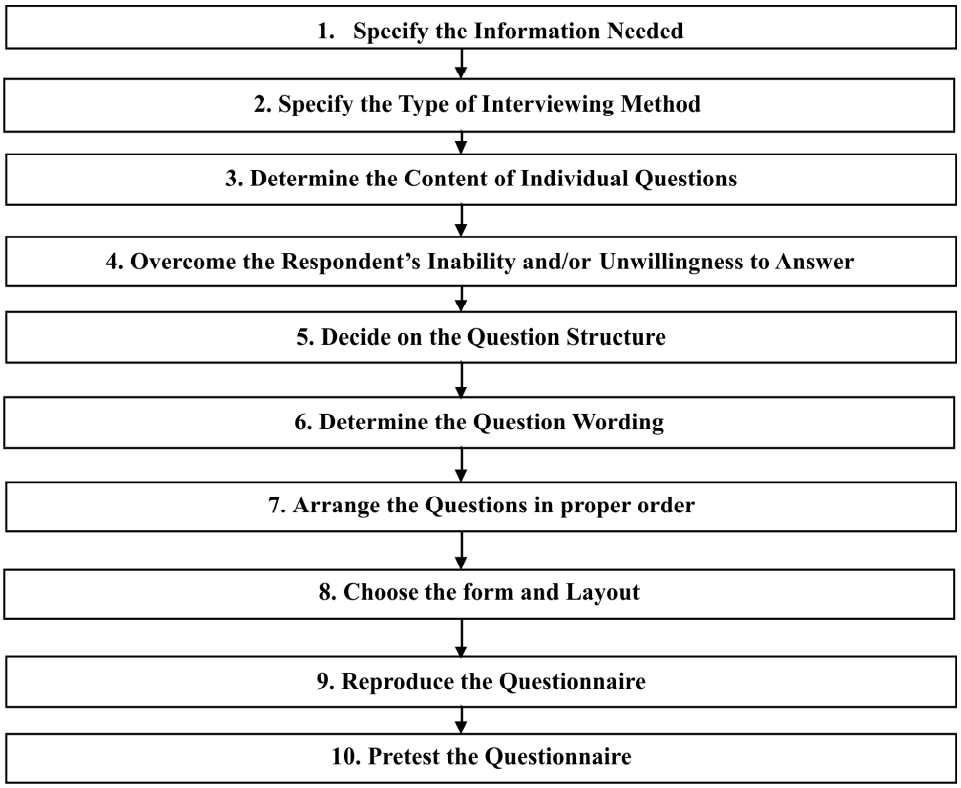
8.4 QUESTIONNAIRE DESIGN PROCESS

This section presents guidelines useful to beginning researchers in designing questionnaires.

Although these rules can help you avoid major mistakes, the fine-tuning of a questionnaire comes from the creativity of a skilled researcher.

Questionnaire design will be presented as a series of steps (see figure below) : (1) Specify the information needed, (2) specify the type of interviewing method, (3) determine the content of individual questions, (4) overcome the respondent's inability and/or unwillingness to answer, (5) decide on the question structure, (6) determine the question wording, (7) arrange the questions in proper order, (8) choose the form and layout, (9) reproduce the questionnaire, and (10) pretest the questionnaire.

We will present guidelines for each step. In practice, the steps are interrelated and the development of a questionnaire will involve some iteration and looping. For example, the researcher may discover that respondents misunderstand all the possible wordings of a question. This may require a loop back to the earlier step of deciding on the question structure. Following the steps and guidelines presented in this unit should result in good questionnaires.



(i) Specify the Information Needed: The first step in questionnaire design is to specify the information needed, a task that has already been done earlier. As was discussed in Unit 2, this is one component of developing an approach to the problem (step 2 of the marketing research process). It is helpful to review components of the problem and the approach, particularly the information needed.

(iii) Interviewing Method: The second step in questionnaire design is to specify the interviewing method, something that has already been done at an earlier stage. An appreciation of how the type of interviewing method influences questionnaire design can be obtained by

considering how the questionnaire is administered under each method. Thus, lengthy, complex, and varied questions can be asked. In telephone interviews, the respondents interact with the interviewer but not face to face and they do not see the questionnaire. This limits the type of questions that can be asked to short and simple ones. Mail questionnaires are self-administered, so the questions must be simple, and detailed instructions must be provided. In computer-assisted personal interviews (CAPI) and computer-assisted telephone interviews (CATI), complex skip patterns and randomization of questions to eliminate order bias can be accommodated easily. Internet questionnaires share many of the characteristics of CAPI, but e-mail questionnaires have to be simpler. Questionnaires designed for personal and telephone interviews should be written in a conversational style. The type of interviewing method also influences the content of individual questions.

(iii) Determine the Content of Individual Questions: Once the information needed is specified and the type of interviewing method has been chosen, the next step is to determine individual question content: what to include in individual questions.

Is the Question Necessary? Every question in a questionnaire should contribute to the information needed or serve some specific purpose. If there is no satisfactory use for the data resulting from a question, that question should be eliminated. In certain situations, however, questions may be asked that are not directly related to the information that is needed but nevertheless serve some purpose. It is useful to ask some neutral questions at the beginning of the questionnaire to establish involvement and rapport, particularly when the topic of the questionnaire is sensitive or controversial. Sometimes filler questions are asked to disguise the purpose or sponsorship of the project. Rather than limiting the questions to the brand of interest, questions about competing brands may also be included to disguise the sponsorship. For example, a survey on personal computers sponsored by Hewlett Packard (HP) may also include filler questions related to Dell and Apple.

Are Several Questions Needed Instead of One? Once we have ascertained that a question is necessary, we must make sure that it is sufficient to get the desired information. Sometimes, several questions are needed to obtain the required information in an unambiguous manner.

Consider the following question:

"Do you think Sprite is a tasty and refreshing soft drink?"

A yes answer will presumably be clear, but what if the answer is no? Does this mean that the respondent thinks that Sprite is not tasty, that it is not refreshing, or that it is neither tasty nor refreshing? Such a question is called a **double-barrelled question** because two or more questions are combined into one. To obtain the required information unambiguously, two distinct questions should be asked:

"Do you think Sprite is a tasty soft drink?" and

"Do you think Sprite is a refreshing soft drink?"

(iv) **a. Overcome the Respondent's Inability to Answer:** Researchers should not assume that respondents are able to provide accurate or reasonable answers to all questions. The respondents will be unable to respond accurately if they are not informed or unable to articulate their responses.

Is the Respondent Informed? Respondents are often asked about topics on which they are not informed. A husband may not be informed about monthly expenses for groceries and department store purchases if it is the wife who makes these purchases, or vice versa. Research has shown that respondents will often answer questions even though they are uninformed. In situations where not all respondents are likely to be informed about the topic of interest, questions that measure familiarity, product use, and past experience should be asked before questions about the topics themselves. Such questions enable the researcher to filter out respondents who are not adequately informed. A "don't know" option appears to reduce uninformed responses without reducing the overall response rate or the response rate for questions about which the respondents have information. Hence, this option should be provided when the researcher expects that respondents may not be adequately informed about the subject of the question. Also, in

some cases it may be appropriate to give the respondents relevant information about the brand or product before asking them to express their opinions. The ability of the respondents can also be enhance by asking questions in a way that will help them remember or respond.

Can the Respondent Articulate His or Her Responses? Respondents may be unable to articulate certain types of responses. For example, if asked to describe the atmosphere of the department store they would prefer to patronize, most respondents may be unable to phrase their answers. On the other hand, if the respondents are provided with alternative descriptions of store atmosphere, they will be able to indicate the one they like the best. If respondents are unable to articulate their responses to a question, they are likely to ignore that question and may refuse to respond to the rest of the questionnaire. Thus, respondents should be given aids, such as pictures, maps, and descriptions, to help them articulate their responses.

(iv) **b. Overcome the Respondent's Unwillingness to Answer:** Even if respondents are able to answer a particular question, they may be unwilling to do so either because too much effort is required or the information requested is sensitive.

Effort Required of the Respondent : Most respondents are unwilling to devote a lot of effort to providing information. Hence, the researcher should minimize the effort required of the respondents by providing the response options. Suppose the researcher is interested in determining from which departments in a store the respondent purchased merchandise on the most recent shopping trip. This information can be obtained in at least two ways. The researcher could ask the respondent to list all the departments from which merchandise was purchased on the most recent shopping trip, or the researcher could provide a list of departments and ask the respondent to check the applicable ones.

Sensitive Information: Respondents are unwilling to disclose, at least accurately, sensitive information because this may cause embarrassment or threaten the respondent's prestige or self-image. If pressed for the answer, respondents may give biased responses, especially during personal

interviews. Sensitive topics include money, family life, political and religious beliefs, and involvement in accidents or crimes. Respondents may be encouraged to provide sensitive information that they are otherwise unwilling to give by using the following desensitizing techniques:

1. Place sensitive topics at the end of the questionnaire. By then, initial mistrust has been overcome, rapport has been created, the legitimacy of the project has been established, and respondents are more willing to give information.
2. Preface the question with a statement that the behaviour of interest is common. For example, before requesting information on credit card debt, say, "Recent studies show that most Indians are in debt." This technique is called the use of counter biasing statements.
3. Ask the question using the third-person technique. In other words, phrase the question as if it referred to other people.
4. Provide response categories rather than asking for specific figures. Do not ask, "What is your household's annual income?" Instead, ask the respondent to check the appropriate income category: under $25,000, $25,001–$50,000, $50,001–$75,000, or over $75,000. In personal interviews, give the respondents cards that list the numbered choices. The respondents then indicate their responses by number.

(v) Decide on the Question Structure: A question may be unstructured or structured. In the following sections, we define unstructured questions and discuss their relative advantages and disadvantages, and then consider the major types of structured questions: multiple-choice, dichotomous, and scales.

Unstructured Questions : Unstructured questions are open-ended questions that respondents answer in their own words. They are also referred to as free-response or free-answer questions. The following are some examples:

- What is your occupation?
- Who is your favorite singer?

Open-ended questions are good as first questions on a topic. They enable the respondents to express general attitudes and opinions that can help the researcher interpret their responses to structured questions. Unstructured questions have a much less biasing influence on response than structured questions. Hence, unstructured questions are useful in exploratory research.

A principal disadvantage of unstructured questions is that potential for interviewer bias is high. Whether the interviewers record the answers verbatim or write down only the main points, the data depend on the skills of the interviewers. Voice recorders should be used if verbatim reporting is important. Another major disadvantage of unstructured questions is that the coding of responses is costly and time consuming. The coding procedures required summarizing responses in a format useful for data analysis and interpretation can be extensive. By their very nature, unstructured or open-ended questions give extra weight to respondents who are more articulate. Also, unstructured questions are not suitable for self-administered questionnaires (mail, CAPI, e-mail, and Internet) because respondents tend to be briefer when they are writing rather than speaking. In general, open-ended questions are useful in exploratory research and as opening questions. Otherwise, their disadvantages outweigh their advantages in a large survey.

Structured Questions : Structured questions specify the set of response alternatives and the response format. A structured question may be multiple-choice, dichotomous, or scale.

Multiple-Choice Questions In multiple-choice questions, the researcher provides a choice

of answers and respondents are asked to select one or more of the alternatives given.

Dichotomous Questions A **dichotomous question** has only two response alternatives: yes or no, agree or disagree, and so on. Often, the two alternatives of interest are supplemented by a neutral alternative, such as “no opinion,” “don’t know,” “both,” or “none.” The question asked before about intentions to buy a new car as a multiple-choice question can also be asked as a dichotomous question.

Do you intend to buy a new car within the next six months?

_____ Yes

_____ No

(vi) Determine the Question Wording

Question wording is the translation of the desired question content and structure into words that respondents can clearly and easily understand. Deciding on question wording is perhaps the most critical and difficult task in developing a questionnaire. If a question is worded poorly, respondents may refuse to answer it or may answer it incorrectly. The first condition, in which respondents refuse to answer, is known as item non response and can increase the complexity of data analysis. The second condition leads to response error, discussed earlier in this chapter. Unless the respondents and the researcher assign exactly the same meaning to the question, the results will be biased. To avoid these problems, we offer the following guidelines:

- **define the issue,**
- **use ordinary words,**
- **use unambiguous words,**
- **avoid leading or biasing questions, and**
- **use positive and negative statements.**

(vii) Arrange the Questions in Proper Order

Opening Questions : The opening questions can be crucial in gaining the confidence and cooperation of respondents. The opening questions should be interesting, simple, and nonthreatening. Questions that ask respondents for their opinions can be good opening questions because most people like to express their opinions. Sometimes such questions are asked even though they are unrelated to the research problem and their responses are not analyzed. In some instances, it is necessary to screen or qualify the respondents, or determine whether a respondent is eligible to participate in the interview. In these cases, the screening or qualifying questions serve as the opening questions.

Type of Information : The type of information obtained in a questionnaire may be classified as: (1) basic information, (2) classification information, and (3) identification information.

Basic information relates directly to the research problem. **Classification information**, consisting of socioeconomic and demographic characteristics, is used to classify the respondents and understand the results. **Identification information** includes the respondent's name, postal address, e-mail address, and telephone number. Identification information may be obtained for a variety of purposes, including verifying that the respondents listed were actually interviewed, remitting promised incentives, and so on. As a general guideline, basic information should be obtained first, followed by classification, and, finally, identification information. The basic information is of greatest importance to the research project and should be obtained first, before the risk of alienating the respondents by asking a series of personal questions.

(viii) Choose the Form and Layout

The format, spacing, and positioning of questions can have a significant effect on the results. This is particularly important for self-administered questionnaires. It is good practice to divide a questionnaire into several parts. Several parts may be needed for questions pertaining to the basic information. The questions in each part should be numbered, particularly when branching questions are used. Numbering of questions also makes the coding of responses easier. The questionnaires themselves should be numbered serially. This facilitates the control of questionnaires in the field as well as the coding and analysis. Numbering makes it easy to account for the questionnaires and to determine if any have been lost. A possible exception to this rule is mail questionnaires. If these are numbered, respondents assume that a given number identifies a particular respondent. Some respondents may refuse to participate or may answer differently under these conditions. However, recent research suggests that this loss of anonymity has little, if any, influence on the results.

(ix) Reproduction of the Questionnaire

How a questionnaire is reproduced for administration can influence the results. For example, if the questionnaire is reproduced on poor-quality paper or is otherwise shabby in appearance, the respondents will think the project is unimportant and the quality of response will be adversely affected. Therefore, the questionnaire should be reproduced on good-quality paper and have a professional appearance. Each question should be reproduced on a single page (or double-page spread). A researcher should avoid splitting a question, including its response categories. Split questions can mislead the interviewer or the respondent into thinking that the question has ended at the end of a page. This will result in answers based on incomplete questions. Vertical response columns should be used for individual questions. It is easier for interviewers and respondents to read down a single column rather than sideways across several columns. Sideways formatting and splitting, done frequently to conserve space, should be avoided. The tendency to crowd questions together to make the questionnaire look shorter should be avoided because it can lead to errors.

(x) Pretest the Questionnaire

Pretesting refers to the testing of the questionnaire on a small sample of respondents to identify and eliminate potential problems or bugs. Even the best questionnaire can be improved by pretesting. As a general rule, a questionnaire should not be used in the field without adequate pretesting. All aspects of the questionnaire should be tested, including question content, wording, sequence, form and layout, question difficulty, and instructions. The respondents in the pretest should be similar to those who will be included in the actual survey in terms of background characteristics, familiarity with the topic, and attitudes and behaviours of interest. In other words, respondents for the pretest and for the actual survey should be drawn from the same population.

Pretests are best done by personal interviews, even if the actual survey is to be conducted by mail, telephone, or electronic means, because interviewers can observe respondents' reactions and attitudes. After the necessary changes have been made to the survey, another pretest should be conducted by mail, telephone, or electronic means if those methods are to be used in the actual survey. The latter pretests should reveal problems peculiar to the interviewing method. To the extent possible, a pretest should involve administering the questionnaire in an environment and context similar to that of the actual survey.

Ordinarily, the pretest sample size is small, varying from fifteen to thirty respondents for the initial testing, depending on the heterogeneity of the target population. The sample size can increase substantially if the pretesting involves several stages or waves. The questionnaire should be revised to correct for the problems identified during pretesting. After each significant revision of the questionnaire, another pretest should be conducted using a different sample of respondents. One pretest is a bare minimum. Pretesting should be continued until no further changes are needed. Finally, the responses obtained from the pretest should be coded and analyzed. Table 8.2 summarizes the questionnaire design process in the form of a checklist.

Table 8.1 Questionnaire Design Checklist

Step 1 Specify The Information Needed
1. Ensure that the information obtained fully addresses all the components of the problem.
2. Have a clear idea of the target population.
Step 2 Type of Interviewing Method
1. Review the type of interviewing method determined based on considerations discussed in Chapter 5.
Step 3 Individual Question Content
1. Is the question necessary?
2. Are several questions needed instead of one to obtain the required information in an unambiguous manner?
3. Do not use double-barreled questions.

Step 4 Overcoming Inability and Unwillingness to Answer

1. **Is the respondent informed?**
2. **If respondents are not likely to be informed, questions that measure familiarity, product use, and pastexperience should be asked before questions about the topics themselves.**
3. **Can the respondent remember?**
4. **Can the respondent articulate?**
5. **Minimize the effort required of the respondents.**
6. **Make the request for information seem legitimate.**
7. **Is the information sensitive?**

Step 5 Choosing Question Structure

1. **Open-ended questions are useful in exploratory research and as opening questions.**
2. **Use structured questions whenever possible.**
3. **In multiple-choice questions, the response alternatives should include the set of all possible choices and should be mutually exclusive.**
4. **In a dichotomous question, if a substantial proportion of the respondents can be expected to be neutral, include a neutral alternative.**
5. **Consider the use of the split ballot technique to reduce order bias in dichotomous and multiple-choice questions.**
6. **If the response alternatives are numerous, consider using more than one question**.

Step 6 Choosing Question Wording

1. **Define the issue in terms of who, what, when, where, why, and way (the six Ws).**
2. **Use ordinary words. Words should match the vocabulary level of the respondents.**
3. **Avoid ambiguous words: usually, normally, frequently, often, regularly, occasionally, sometimes, etc.**
4. **Avoid leading questions that clue the respondent to what the answer should be.**
5. **Use positive and negative statements.**

Step 7 Determine the Order of Questions

1. **The opening questions should be interesting, simple, and nonthreatening.**
2. **Qualifying questions should serve as the opening questions.**
3. **Basic information should be obtained first, followed by classification, and finally, identification information.**
4. **Difficult, sensitive, or complex questions should be placed late in the sequence.**
5. **General questions should precede the specific questions.**
6. **Questions should be asked in a logical order.**

Step 8 Form and Layout

1. **Divide a questionnaire into several parts.**
2. **Questions in each part should be numbered.**
3. **The questionnaires themselves should be numbered serially.**

Step 9 Reproduction of the Questionnaire

1. **The questionnaire should have a professional appearance.**
2. **Booklet format should be used for long questionnaires.**
3. **Each question should be reproduced on a single page (or double-page spread).**
4. **The tendency to crowd questions to make the questionnaire look shorter should be avoided.**

Step 10 Pretesting

1. **Pretesting should be done always.**
2. **All aspects of the questionnaire should be tested, including question content, wording, sequence, form and layout, question difficulty, and instructions.**
3. **The respondents in the pretest should be similar to those who will be included in the actual survey.**
4. **Begin the pretest by using personal interviews.**
5. **Pretest should also be conducted by mail, telephone, or electronically if those methods are to be used in the actual survey.**
6. **A variety of interviewers should be used for pretests.**

7. **The pretest sample size is small, varying from 15 to 30 respondents for the initial testing.**
8. **After each significant revision of the questionnaire, another pretest should be conducted, using a different sample of respondents.**
9. **The responses obtained from the pretest should be coded and analyzed.**



CHECK YOUR PROGRESS

Q.3: What are unstructured Questions

.....

.....

Q.4: What is Pretesting

.....

.....



8.5 LET US SUM UP

To collect quantitative primary data, a researcher must design a questionnaire or an observational form. A questionnaire has three objectives. It must translate the information needed into a set of specific questions the respondents can and will answer. It must motivate respondents to complete the interview. It must also minimize response error.

The questionnaire design process begins by specifying (1) the information needed and (2) the type of interviewing method. The next step is (3) to decide on the content of individual questions. Each question should overcome the respondents' inability and/or unwillingness to answer (step 4). Respondents may be unable to answer if they are not informed or cannot articulate the response. The unwillingness of the respondents to answer must also be overcome. Respondents may be unwilling to answer if the question requires too much effort or solicits sensitive information. Next comes the decision regarding the question structure (step 5). Questions can be unstructured (open-ended) or structured to varying degrees.

Structured questions include multiple-choice questions, dichotomous questions, and scales.

Determining the wording of each question (step 6) involves defining the issue, using ordinary words, using unambiguous words, and using dual statements. The researcher should avoid leading questions. Once the questions have been worded, the order in which they will appear in the questionnaire must be decided (step 7). Special consideration should be given to opening questions, type of information, difficult questions, and the effect on subsequent questions. The questions should be arranged in a logical order. The stage is now set for determining the form and layout of the questions (step 8). Several factors are important in reproducing the questionnaire (step 9). These factors include appearance, fitting each question on one page or double-page spread, response category format, and avoiding overcrowding. Last but not least is pretesting (step 10). Important issues are the extent of pretesting, the nature of the respondents, the type of interviewing method, the type of interviewers, sample size, and editing and analysis.

The questionnaire should be adapted to the specific cultural environment and should not be biased in terms of any one culture. Also, the questionnaire may have to be suitable for administration by more than one method because different interviewing methods may be used in different countries. Questionnaires translated into different languages should be equivalent.



8.6 FURTHER READING

1. Malhotra, N.K. and Dash, S. (2011). *Marketing research: An Applied Orientation* (6th edition), New Delhi: Pearson Education.



8.7 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q1. A questionnaire is a formalized set of questions for obtaining information from respondents.

Ans to Q2: Any questionnaire has three main objectives. **First**, it must translate the information needed into a set of specific questions **Second**, a questionnaire must uplift, motivate, and encourage the respondent to become involved in the interview.**Third,** a questionnaire should minimize response error.

Ans to Q3: Unstructured questions are open-ended questions that respondents answer in their own words. They are also referred to as free-response or free-answer questions.

Ans to Q4: Pretesting refers to the testing of the questionnaire on a small sample of respondents to identify and eliminate potential problems or bugs. Even the best questionnaire can be improved by pretesting.



8.8 MODEL QUESTIONS

Q.1: What are the three main objectives of any questionnaire?

Q.2: Explain how the mode of administration affects questionnaire design.

Q.3: What are the different methods of administering a questionnaire?

Q.4: What is a double-barreled question?

Q.5: What is a split-ballot technique and what is it used for?

Q.6: What are the reasons that respondents are unwilling to answer specific questions?

Q.7: What are the advantages and disadvantages of unstructured questions?

Q.8: What are the issues involved in designing multiple-choice questions?

Q.9: What are the guidelines available for deciding on question wording?

Q.10: What is a leading question? Give an example.

Q.11: What is the proper order for questions intended to obtain basic, classification, and identification information?

Q.12: What are counter biasing questions and what are they used for?

Q.13: Describe the issues involved in pretesting a questionnaire.

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UNIT 9: DATA PROCESSING

UNIT STRUCTURE

9.1 Learning Objectives

9.2 Introduction

9.3 Processing of Data

9.4 Editing of Data

9.4.1 Types of editing of Data

9.5 Coding of Data

9.6 Tabulation of Data

9.7 Let Us sum Up

9.8 Further Reading

9.9 Answers to Check your progress

9.10 Model Questions

9.1 LEARNING OBJECTIVES

After going through thus unit, you will be able to:

- learn the concept of editing
- discuss the meaning coding
- outline the process of tabulation
- describe the computer processing of data

9.2 INTRODUCTION

In this unit we are going to discuss the process and analysis of data. In the earlier units we discussed about the collection of data through primary and secondary methods, also we discussed on the concept and approaches of sampling and questionnaire design. Let us now discuss some of the basic terms and concepts related to research i.e. data analysis , data processing and data estimation. In our day to day life, we come across several information through print, audio and visual media, social gatherings and discussions, but we rarely think about that how these informations are being collected, processed and analyzed. As discussed in the previous

unit, the collection of data refers to a plan for gathering data, information from field situations. All these data collection effort will be become worthless, if the collected data are not properly processed and analyzed. **Data processing** is concerned with editing, coding, classifying, tabulating and charting and diagramming research data. Let us now discuss the approach in detail in the following sections and subsections.

9.3 PROCESSING OF DATA

The processing of data is an essential approach of managing and systemizing the facts and writing of a research report. Data processing is a series of actions or steps performed on data to verify, organize, transform, integrate, and extract data in an appropriate output form for subsequent use. Methods of processing must be rigorously documented to ensure the utility and integrity of the data. Processing of data is classified in the following five steps:

1. Editing of Data
2. Coding of Data
3. Classification of Data
4. Tabulation of Data
5. Diagrammatic representation of Data

Let us discuss these steps briefly:

1. **Editing of Data:** Editing is the first step in data processing. Editing is the process of examining the data collected in questionnaires/ schedules to detect errors and omissions and to see that they are corrected and the schedules are ready for tabulation. When the whole data collection is over a final and a thorough check up is made. (will be discussed in the following section 9.4)
2. **Coding of Data:** Coding is necessary for efficient analysis and through it the several replies may be reduced to a small number of classes which contain the critical information required for analysis. Coding decisions should usually be taken at the designing stage of the questionnaire. (will be discussed in the following section 9.5)