Yashwantrao
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ज्ञानगंगा घरोघरी

MKG 301

MBA : SECOND YEAR

SEMESTER III

MARKETING GROUP

MARKETING RESEARCH

YASHWANTRAO CHAVAN MAHARASHTRA OPEN UNIVERSITY

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Introduction

In order to gain useful consumer insights, which allowed the company to optimize the product and position it successfully in the market, Procter & Gamble had to plan a market research process. This process included asking market research question(s), collecting data, and analyzing these using quantitative methods. This book provides an introduction to the skills necessary for conducting or commissioning such market research projects. It is written for two audiences:

- Students of business and market research, and
- Practitioners wishing to know more about market research, or those who need a practical, yet theoretically sound, reference.

This book is a bridge between the theory of conducting quantitative research and its execution, using the market research process as a framework. We discuss market research, starting with identifying the research question, designing the data collection process, collecting, and describing data. We also introduce essential data analysis techniques, and the basics of communicating the results, including a discussion on ethics. Each unit on quantitative methods describes key theoretical choices.

All units are written in an accessible and comprehensive way so that non-technical readers can also easily grasp the data analysis methods that are introduced. Each unit on research methods includes examples to help the reader get a hands-on feel for the technique. Each unit concludes with an illustrated real-life case, demonstrating the application of a quantitative method. We also provide additional real-life cases, including datasets, thus allowing readers to practice what they have learnt. Other pedagogical features such as key words, examples, and end-of-unit questions support the contents. This book is concise, focusing on the most important aspects that a market researcher, or manager interpreting market research, should know. Many units provide links to further readings and other websites.

- Dr. Vinay Sharma
Dr. Piyush Seth
Dr. Latika Ajitkumar Ajbani
Dr. Surendra Patole

Message from the Vice-Chancellor

Dear Students,

Greetings!!!

I offer cordial welcome to all of you for the Master's degree programme of Yashwantrao Chavan Maharashtra Open University.

As a post graduate student, you must have autonomy to learn, have information and knowledge regarding different dimensions in the field of Commerce & Management and at the same time intellectual development is necessary for application of knowledge wisely. The process of learning includes appropriate thinking, understanding important points, describing these points on the basis of experience and observation, explaining them to others by speaking or writing about them. The science of education today accepts the principle that it is possible to achieve excellence and knowledge in this regard.

The syllabus of this course has been structured in this book in such a way, to give you autonomy to study easily without stirring from home. During the counseling sessions, scheduled at your respective study centre, all your doubts will be clarified about the course and you will get guidance from some experienced and expert professors. This guidance will not only be based on lectures, but it will also include various techniques such as question-answers, doubt clarification. We expect your active participation in the contact sessions at the study centre. Our emphasis is on 'self study'. If a student learns how to study, he will become independent in learning throughout life. This course book has been written with the objective of helping in self-study and giving you autonomy to learn at your convenience.

During this academic year, you have to give assignments and complete the Project work wherever required. You have to opt for specialization as per programme structure. You will get experience and joy in personally doing above activities. This will enable you to assess your own progress and thereby achieve a larger educational objective.

We wish that you will enjoy the courses of Yashwantrao Chavan Maharashtra Open University, emerge successful and very soon become a knowledgeable and honorable Master's degree holder of this university.

Best Wishes!

- Vice-Chancellor

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MARKETING RESEARCH MKG-301

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UNIT 1: INTRODUCTION TO MARKETING RESEARCH

1.0 Unit Objectives

After reading this unit, you should be able to get familiar with the meaning of marketing research and its objective. In addition, the objective is to make you understand the process of marketing research and how it helps in decision making process.

1.1 Introduction

Research is the process of searching the relevant information in a systematic manner. It can be defined as an activity which involves identification of the problem, formulation of hypothesis, research design, collecting, summarizing and analyzing the data and finally conclusion either in the form of giving solution or in the form of theories. The major objective of the research is to identify the solution of a particular problem in a systematic manner. Different types of research have been conducted in different fields of the study, e.g. in order to identify the solution of a problem fundamental research has to be carried out while in order to identify the solution of an immediate problem applied research has to be carried out. However, all type of researches follows either qualitative or quantitative approach. The quantitative approach is primarily focused on quantity of the data obtained from the research, while in qualitative research the primary focus is on the quality of the obtained data.

1.1.1 Research Objectives

Research is a systematic process of identification, designing, collecting, analyzing and summarizing the data in order to give the solutions to the problem of a company. The main research objectives are as follows:

1) To identify the problem and give the specific solution related to the problem.

Example : Why the demand of a particular product or ervicefalls?

Why there is fluctuation in the business environment?

2) To develop new theories and concepts.

Example: Green marketing, Horizontal marketing etc.

3) To identify the alternative solutions of a problem.

Example: Which strategy (push or pull) must be followed for the promotion of the product?

4) To make the process of decision making easier.

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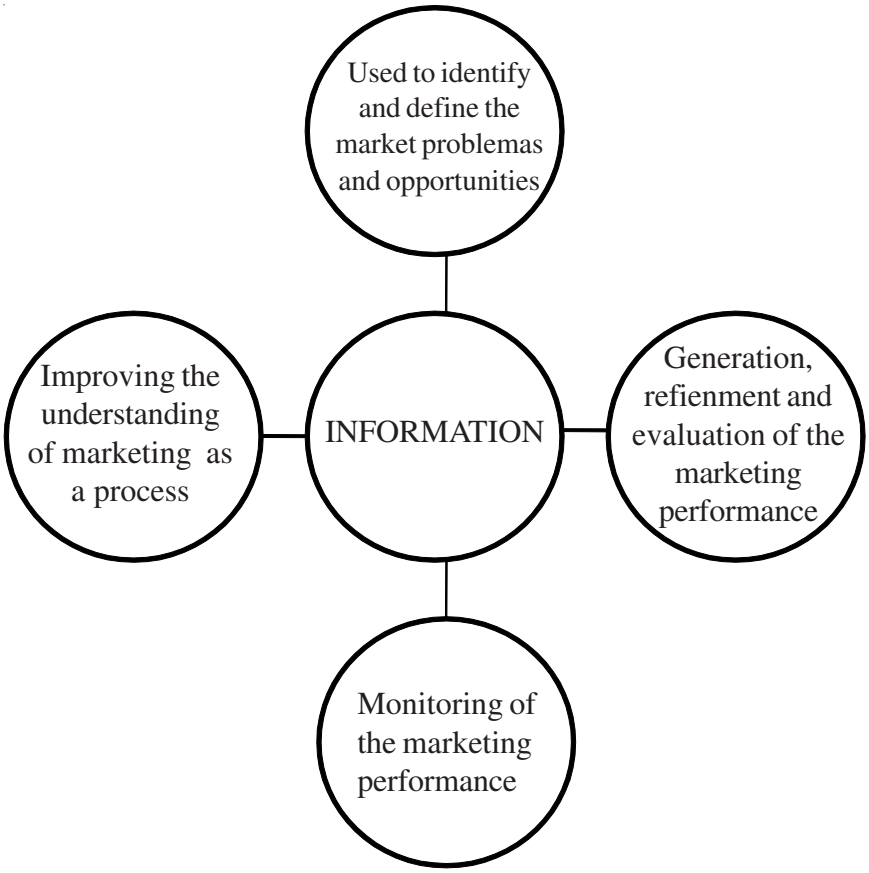
1.1.2 Marketing Research

According to the American Marketing Association (AMA), Marketing Research is defined as, "the function that link customer and public to the marketer through the ***information***".



Check Your Progress

What do you mean by marketing reserach?

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Thus, marketing research is defined as the systematic and objective:

- Identification
- Collection
- Analyzing
- Dissemination
- And use of the information

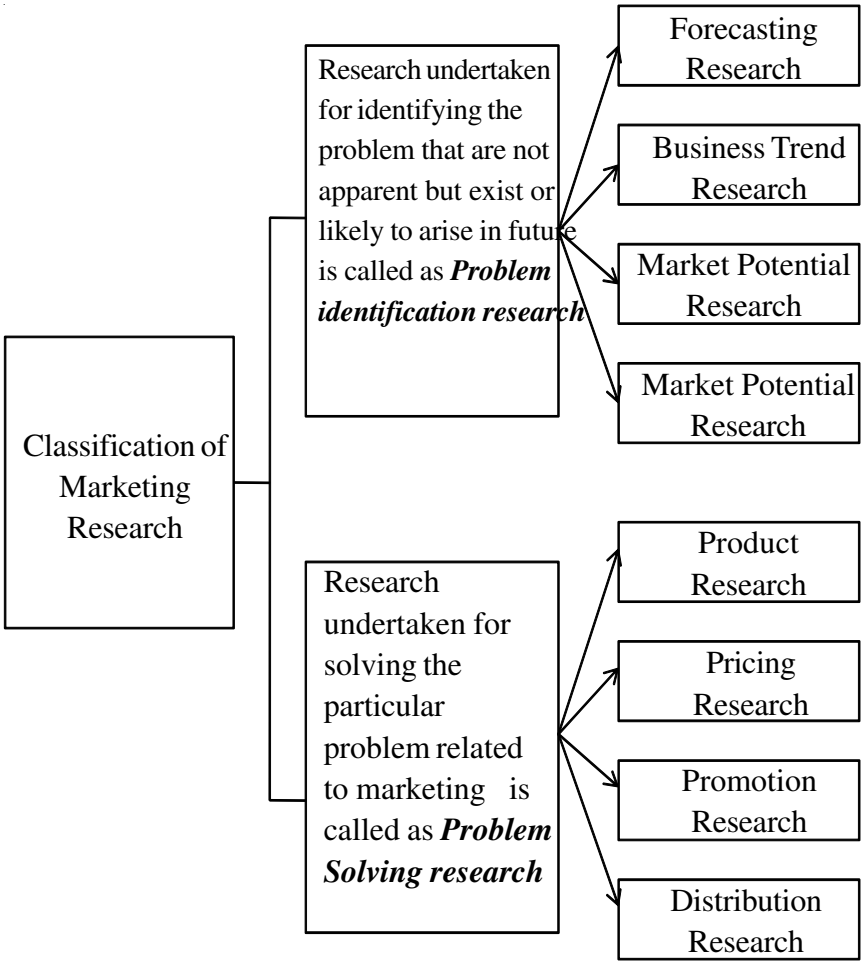
For the purpose of improving decision making related to the,

- Identification and
- Solutions of problems and opportunities in marketing (Adopted from : Malhotra and Dash, 2010)

1.1.3 Classification of Marketing Research

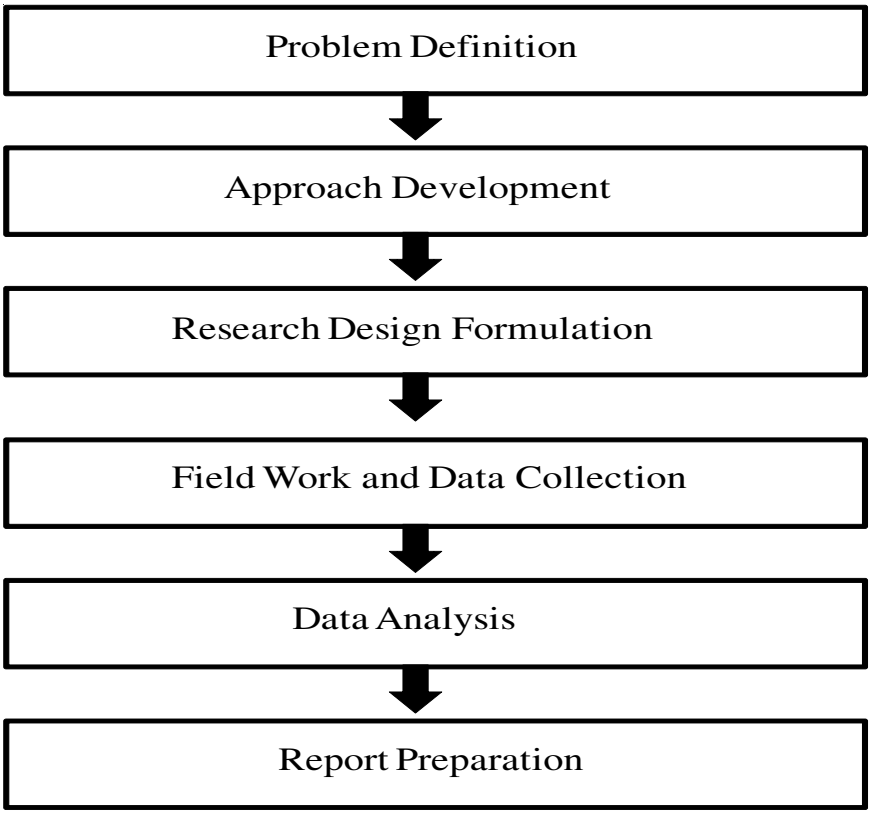
Marketing Research can be classified into two categories:

- Problem Identification Research
- Problem Solving Research



1.2 Process of Marketing Research

Marketing researchprocess is consisting of six steps:



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1.2.1 Problem Definition

The first step in process of marketing research is to define the problem. In this step, researcher must define the purpose of the study, background of the study, information required and also explains how it will be helpful in decision making process. It involve the discussion with the experts, decision makers, analyzing the secondary data and also include some qualitative research like focus group discussion as well.

1.2.2 Approach Development

This step involves the formulation of the research objectives, analytical models, theoretical framework, research questions and hypothesis formulation and information required.

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1.2.3 Research Design Formulation

Research design is defined as the blueprint for conducting the research process. The main purpose of the research design is to test the hypothesis formulated and determine the tentative solution to the research questions. There are two types of research design:

- Exploratory Research Design
- Causal Research Design

This step also addressed the issue of how the data will be collected from the respondents (e.g. with the help of experiment or by conducting a survey).

Formulation of research design includes:

- Defining the information required
- Analysis of secondary data
- Qualitative research
- Methods for obtaining the quantitative data
- Scaling techniques
- Designing the questionnaire
- Sampling
- Data Analysis

1.2.4 Field Work / Data Collection

Field work involves a capable staff that operates either in the field or electronically or from the office in order to collect the data. Right selection, proper training, necessary supervision and

the timely evaluation of the staff helps in reducing the error occurred during the data collection.

1.2.5 Data Analysis

Data analysis includes:

- Editing
- Coding
- Transcription and
- Verification of the data

1.2.6 Report Preparation

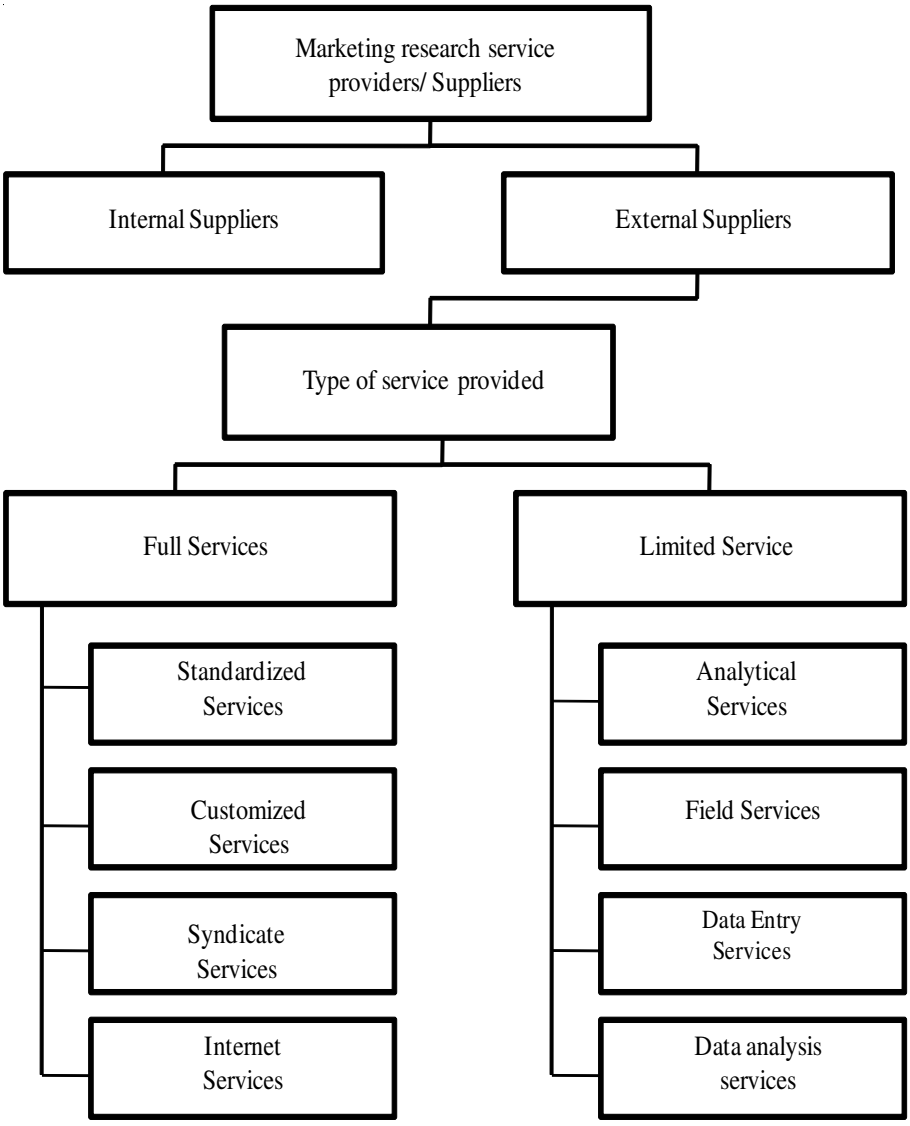
The last step of the marketing research process is the report preparation and the presentation. The whole process must be documented in a report that includes the problem definition, description of the research approach, research design, data collection procedure, data analysis methodology and show the results and main findings of the research.

1.3 Marketing Research Industry

The industry which is consists of the suppliers providing the services related to the marketing research are known as marketing research industry. Marketing research service providers provide maximum information which is required for decision making.

1.3.1 Marketing Research Service providers

In general marketing research service providers or suppliers has been classified into two categories (further classification) shown in figure given below:



1.3.1.1 Internal Suppliers

It is the department which is located within in the department and only meant for supplying the information related to marketing research. Several organizations ranging from consumer goods (Coca-Cola, P and G) to automobile industries (TATA, Ma,General Motors) to bank (Bank of America) maintain their own marketing research department.

1.3.1.2 External Suppliers

External Suppliers are the external (outside an organization) marketing research companies hired for supplying the data required for marketing research. External suppliers provide two types of services: Limited Services and Full services.

- **Full Service suppliers** Full service suppliers are the suppliers who offer the entire range of activities related to marketing research. There are various types of full services which are discussed below:
  - ✓ **Standardized Services** Services in which the organizations use the standard and set procedures to provide the information to the client related to marketing research are called as standardized services.
  - ✓ **Customized Services** Services in which the organizations tailor the research procedures to best meet the needs of each client are called as customized services.
  - ✓ **Syndicate Services** Services in which the organizations collect and sell the common data which is designed to serve the number of clients are called as syndicate services.
  - ✓ **Internet Services** Services in which the organizations are specialized in conducting the marketing research process online are called as internet services.
- **Limited Service suppliers** Limited service suppliers are the suppliers who are specialized and offer the specific range of activities related to marketing research. There are various types of limited services which are discussed below:
  - ✓ **Analytical Services** Services in which the marketing research company provides the guidance for developing the research design for conducting the research are called as analytical services.

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Check Your Progress

What is the difference between interanl and the external suppliers?

- ✓ **Field Services** Organizations that have expertise in collecting data from field for the research are known as field service providers.
- ✓ **Data Entry Services**Organization whose primary aim is to convert the interviews or surveys into the usable data for performing the statistical analysis to complete the research process.
- ✓ **Data Analysis Services** Organizations that have expertise in statistical analysis of quantitative data are known as data analysis service providers.

1.4 Summary

Marketing research is a systematic and objective process of identifying and solving the particular problem related to the marketing. Thus, marketing research has been classified into two categories:

- ✓ Problem identification research and
- ✓ Problem solving research.

The entire process of marketing research is consisting of six steps. The process of marketing research may be performed internally or can be hired from the external suppliers, which are known as marketing research industry. Limited service providers have the expertise in one or few services while full service providers offer the full range of services required for conducting the marketing research. Because of tremendous need of marketing research, attractive marketing research opportunities are available with the marketing research organizations, advertising agencies, non-business organizations, research department etc. Information obtained plays a very crucial role in the entire process of marketing research.

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1.5 Key Terms

- **Marketing Research:** According to the American Marketing Association (AMA), Marketing Research is defined as, "the function that link customer and public to the marketer through the ***information***".
- **External Suppliers :** They are the external (outside an organization) marketing research companies hired for supplying the data required for marketing research

1.6 Review Questions

1. What do you mean by marketing reserach?
2. What are the steps in the process of marketing research?
3. Explain the following terms:
   a) Approch development
   b) Customised services
   c) Analtical services
4. What is the difference between interanl and the external suppliers?
5. What do you mean by reserch design formulation?

Check your progress and review questions :

1. Business research comes within the purview of ..... research.
2. ..... Market research, which was previously known as industrial marketing research.
3. ..... methods are concerned with attempts to quantify social phenomena and collect and analyse numerical data.
4. The purpose of research is to find solutions through the application of ..... and ..... methods.
5. Research is a systematised effort to gain ..... .
6. Research is a systematic approach to ..... investigation.

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7. ..... is the orderly arrangement of the data in a tabular form.
8. While selecting the sample, the ..... has to be clearly specified.
9. A ..... sampling can be convenience or judgment sampling.
10. The ..... must decide if data is to be collected by observation method or by interviewing.
11. It is better for the researcher to generate as many alternatives as possible during problem ..... .
12. There are ..... steps in the research process.
13. ..... is conducted to solve a problem.
14. In ..... research, an examination of relationship that exists between independent and dependent variable is studied.
15. ..... research is generally used by philosophers.
16. Descriptive research deals with ..... characteristics of the consumer.
17. Evaluation research is an example of ..... research
18. ..... research is done to gather secondary data.
19. Gathering knowledge for knowledge's sake is known as ..... research.
20. In exploratory research, all possible reasons which are ..... are eliminated

Answers:

1. Social science 2. Business to Business (B2B) 3. Quantitative 4. Systematic, scientific 5. New knowledge 6. Purposeful 7. Data tabulation 8. sample unit 9. non-probability 10. Researcher 11. formulation hypothesis 12. Nine 13. Action research 14. Ex-post Facto 15. Conceptual 16. Demographic 17. applied 18. Library 19. basic 20. very obvious.

1.7 Further Readings

- Abrams, M.A., Social Surveys and Social Action, London: Heinemann, 1951.
- Arthur, Maurice, Philosophy of Scientific Investigation, Baltimore: John Hopkins University Press, 1943.
- Bernal, J.D., The Social Function of Science, London: George Routledge and Sons, 1939.
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- S. N. Murthy and U. Bhojanna, Business Research Methods, Excel Books.

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UNIT 2 : PROBLEM DEFINITION

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2.0 Unit Objectives

The objective of this unit is to get familiar with the definition of marketing research problem.

After studying this unit, you will be able to:

- Formulate a research problem
- Identify the selection of the problem
- Report the understanding of problem
- State about necessity of defined problem
- Demonstrate the Self Questioning by researcher while defining the problem.

NOTES

2.1 Introduction

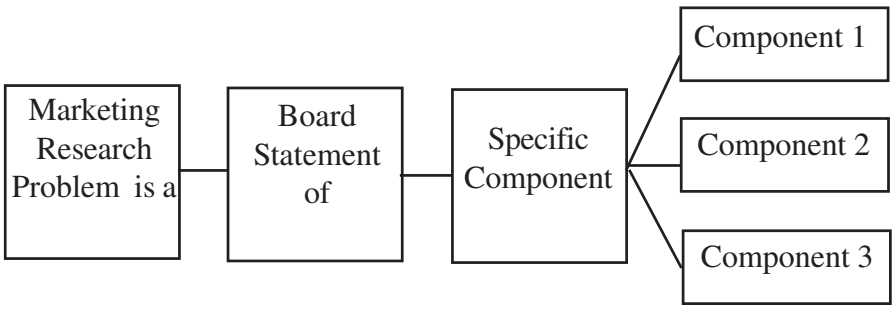
In every organization for decision making some kind of research is required. Manager/ Entrepreneurs must consider past, present and future aspect while making decision. Past gives the details of what has been achieved, on the other hand present shows that what is being achieved by an organization. While, future shows what needs to be achieved by an organization. Research has been conducted in order to collect the data and facts which supports the decision making process. All the decisions are taken on the basis of data, facts and figures derived from the research. According to the famous saying:

"Problem well-defined is half solved"

So there is need to define a problem clearly and the objectives also must be clear. The data collection is meaningless if the objectives have not been defined clearly. Problem definition includes the analysis of problem involving 5W's and 1H i.e. who, what, why, when, where and how.

2.2 Problem Definition

According to Malhotra and Dash (2010), Problem definition has been defined as "A broad statement of the general problem an identification of the specific components of the marketing research problem".



- **Broad Statement:** The preliminary statement of the problem related to marketing research that provides a suitable perspective on the problem.
- **Specific Component**: Specific component of research problem define the important aspect related to the problem and provides the guideline of proceeding further in the process of marketing research.

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2.2.1 Importance of Problem Definition

Defining a research problem properly is a prerequisite for any study and is an importance step. A problem well defined is half solved. Defining the problem is often more essential than its solution because when the problem is formulated, an appropriate technique can be applied to generate alternative solutions. This statement signifies the need for defining a research problem. The problem to be investigated must be defined unambiguously for that will help to discriminate relevant data from the irrelevant ones. When you define a research problem you are trying to reduce the outcome of an answer. The question of course when you speak about "marketing research" is how I can target more customers that I can sell my product to. You are looking for specific answers such as: "What type of soda does all foreign born males between the ages of 25-35 drink?" This is defining the problem. What do you consider foreign born males? What constitutes soda? etc. This is important because companies and sales organization attempt to "target" their market instead of taking a shotgun approach. The process is to first make sure any information you obtain is credible and from a reputable organization. Then break down your problem and pick apart any inconsistencies you may see within you research project. Problem formulation is the key to research process. For a researcher, problem formulation means converting the management problem to a research problem. In order to attain clarity,

Check Your Progress

The objective of research problem should be clearly defined; otherwise the data collection becomes meaningless. Discuss with suitable examples?

the manager and researcher must articulate clearly so that perfect understanding of each other's is achieved.

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2.3 Selection of the Problem

The research problem undertaken for study must be carefully selected. The task is a difficult one, although it may not appear to be so. Help may be taken from a research guide in this connection. Nevertheless, every researcher must find out his own salvation for research problems cannot be borrowed. A problem must spring from the researcher's mind like a plant springing from its own seed. If our eyes need glasses, it is not the optician alone who decides about the number of the lens we require. We have to see ourself and enable him to prescribe for us the right number by cooperating with him. Thus, a research guide can at the most only help a researcher choose a subject.

Inevitably, selecting a problem is somewhat arbitrary, idiosyncratic, and personal. Avoid selecting the first problem that you encounter. Try to select the most interesting and personally satisfying choice from among two or three possibilities. The problem selection should matter to you. You should be eager and enthusiastic.

2.4 Understanding the Problem

Once the problem has been selected, the same has to be understood thoroughly and then the same has to be reframed into meaningful terms from an analytical point of view. The first step in research is to formulate the problem. A company manufacturing television sets might think that it is losing sales to a foreign company. A brief illustration aptly demonstrates how such problem can be ill-conceived. The management of a company felt, a drop in sales was because of the poor quality of product. Subsequently, research was undertaken with a view to improve the quality of

the product. But despite an improvement in quality, sales did not pick up. In this case, we may say that the problem is ill-defined. The actual reason was ineffective sales promotion. The problem thus needs to be carefully identified.

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2.5 Self Questioning by Researcher while Defining the Problem

1. Is the research problem correctly defined?
2. Is the research problem solvable?
3. Can relevant data be gathered through the process of marketing research?
4. Is the research problem significant?
5. Can the research be conducted within the available resources?
6. Is the time given to complete the project sufficient?
7. What exactly will be the difficulties in conducting the study, and hurdles to be overcome?
8. Am I competent, to carry the study out?

Managers often want the results of research in accordance with their expectation. This satisfies them immensely. If one were to closely look at the questionnaire, it is found that in most cases, there are stereotyped answers given by the respondents.

Check Your Progress

Cultural and technological changes can act as a source for research problem identification. Why/why not?

2.6 Summary

- Proper problem formulation is the key to success in research.
- It is vital and any error in defining the problem incorrectly can result in wastage of time and money.

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- Several elements of introspection will help in defining the problem correctly.
- The task of defining a research problem, very often, follows a sequential pattern.
- The problem is stated in a general way, the ambiguities are resolved, thinking and rethinking process results in a more specific formulation of the problem.
- It is done so that it may be a realistic one in terms of the available data and resources and is also analytically meaningful.
- All this results in a well defined research problem that is not only meaningful from an operational point of view.
- But is equally capable of paving the way for the development of working hypotheses and for means of solving the problem itself.

2.7 Key Terms

Marketing Research Problem: It is a situation where your company intends to sell a product or service that fills a specific gap.

Objective of Research: It means to what the researcher aims to achieve.

Pilot Study: A small scale preliminary study conducted before the main research in order to check the feasibility or to improve the design of the research.

Problem Definition: The process in order to clear understanding (explanation) of what the problem is.

Research Problem: It focuses on the relevance of the present research.

2.8 Review Questions

1. The objective of research problem should be clearly defined; otherwise the data collection becomes meaningless. Discuss with suitable examples.

2. Cultural and technological changes can act as a source for research problem identification. Why/why not?
3. Defining a research problem properly is a prerequisite for any study. Why?
4. What precautions should be taken while formulating a problem?
5. If you are appointed to do a research for some problem with the client, what would you take as the sources for problem identification?
6. It may be a problem and at the same time, it can also be viewed as an opportunity. Why/ why not?
7. In some cases, some sort of preliminary study may be needed. Which cases are being referred to and why?
8. A problem well defined is half solved. Comment.
9. While you define a research problem what do you try to do?
10. What do you think as the reason behind specialists suggesting to avoid selecting the first problem that you encounter?

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Check your progress:

1. In order to attain clarity, the manager and researcher must ..... clearly.
2. Problem ..... is the key to research process.
3. To define a problem correctly, a researcher must know: .....
4. A good topic should be small enough for a ..... investigation.
5. A ..... should always avoid selecting the first problem that he encounters.
6. The research problem undertaken for study must be ..... selected.
7. Changes in the demographics, technological and legal changes

affect the .....function.

8. Opportunity related problems produce ..... results.
9. The first step in research is to formulate the ……..
10. ..... and ..... changes can act as a source for research problem identification.
11. Research reports already published may be referred to define a .....
12. When you define a research problem you are trying to ..... the outcome of an answer.
13. A problem well ..... is half solved.
14. Managers often want the results of research in accordance with their .....
15. Assistance of any research organisation, which handles a number of projects of the companies, can be sought to ..... the problem.

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Answers:

1. articulate 2. Formulation 3. what a problem is 4. Conclusive 5. researcher 6. Carefully 7. marketing 8. Negative 9. problem 10. Cultural, technological 11. specific problem 12. Reduce 13. defined 14. Expectation 15. Identify.

2.9 Further Reading

- Abrams, M.A., Social Surveys and Social Action, London: Heinemann, 1951.
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- S. N. Murthy and U. Bhojanna, Business Research Methods, Excel Books.

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UNIT 3 : RESEARCH DESIGN

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3.0 Unit Objectives

After studying this unit, you will be able to:

- Define research design
- Describe the need of research design
- Explain the different types of research design
- Identify the Secondary data and qualitative research
- Recognize the Descriptive research design
- Label the causal research design.

3.1 Introduction

Research design is simply a plan for a study. This is used as a guide in collecting and analyzing the data. It can be called a blue print to carry out the study. It is like a plan made by an architect to build the house, if a research is conducted without a blue print, the result is likely to be different from what is expected at the start. The blue print includes (1) interviews to be conducted, observations to be made, experiments to be conducted data analysis to be made. (2) Tools used to collect the data such as questionnaire (3) what is the sampling methods used.

3.2 An Overview

Research design can be thought of as the structure of research - it is the "glue" that holds all of the elements in a research project together. A successful design stems from a collaborative process involving good planning and communication. Research Design is mainly of three types namely, exploratory, descriptive and causal research. Exploratory research is used to seek insights into general nature of the problem. It provides the relevant variable that need to be considered. In this type of research,

there is no previous knowledge; research methods are flexible, qualitative and unstructured.

Descriptive research is a type of research, very widely used in marketing research. Generally in descriptive study there will be a hypothesis, with respect to this hypothesis, we ask questions like size, distribution, etc. Causal research, this type of research is concerned with finding cause and effect relationship. Normally experiments are conducted in this type of research.

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3.2.1 Need for Research Design

Before starting the research process, efficient and appropriate research design should be prepared. A research design is needed because of the following benefits it provides:

- It helps in smooth functioning of various research operations.
- It requires less effort, time and money.
- It helps to plan in advance the methods and techniques to be used for collecting and analyzing data.
- It helps in obtaining the objectives of the research with the availability of staff, time and money.

The researcher should consider the following factors before creating a research design:

- The method for obtaining information source
- Skills of the researcher and the co-ordinating staff
- Problem objectives
- Nature of the problem
- Time and money available for the research work.

3.2.2 Types of Research Design

Exploratory, descriptive and causal researches are some of the

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major types. Exploratory researchis used to seek insights into general nature of the problem. It provides the relevant variable that need to be considered. In this type of research, there is no previous knowledge; research methods are flexible, qualitative and unstructured. The researcher in this method does not know "what he will find". Descriptive research is a type of research, very widely used in marketing research Generally in descriptive study there will be a hypothesis, with respect to this hypothesis, we ask questions like size, distribution, etc. Causal research, this type of research is concerned with finding cause and effect relationship. Normally experiments are conducted in this type of research.

3.3 Exploratory Research

The major emphasis in exploratory research is on converting broad, vague problem statements into small, precise sub-problem statements, which is done in order to formulate specific hypothesis. The hypothesis is a statement that specifies, "how two or more variables are related?" In the early stages of research, we usually lack from sufficient understanding of the problem to formulate a specific hypothesis. Further, there are often several tentative explanations.In this scenario, very little information is available to point out, what is the actual cause of the problem. We can say that the major purpose of exploratory research is to identify the problem more specifically. Therefore, exploratory study is used in the initial stages of research. Under what circumstances is exploratory study ideal?

Check Your Progress

Can all causal research hypotheses be studied? Why or why not?

The following are the circumstances in which exploratory study would be ideally suited:

- To gain an insight into the problem
- To generate new product ideas
- To list all possibilities. Among the several possibilities, we need to prioritize the possibilities which seem likely

- To develop hypothesis occasionally.

Example: A market researcher working for (new entrant) a company for the first time.

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- To establish priorities so that further research can be conducted.
- Exploratory studies may be used to clarify concepts and help in formulating precise problems.

Example: The management is considering a change in the contract policy, which it hopes, will result in improved satisfaction for channel members. An exploratory study can be used to clarify the present state of channel members' satisfaction and to develop a method by which satisfaction level of channel members is measured.

- To pre-test a draft questionnaire
- In general, exploratory research is appropriate to any problem about which very little isknown. This research is the foundation for any future study.

3.3.1 Characteristics of Exploratory Stage

- Exploratory research is flexible and very versatile.
- For data collection structured forms are not used.
- Experimentation is not a requirement.
- Cost incurred to conduct study is low.
- This type of research allows very wide exploration of views.
- Research is interactive in nature and also it is open ended.

3.3.2 Hypothesis Development at Exploratory Research Stage

- Sometimes, it may not be possible to develop any hypothesis at all, if the situation isbeing investigated for the first time. This is because no previous data is available.

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- Sometimes, some information may be available and it may be possible to formulate atentative hypothesis.
- In other cases, most of the data is available and it may be possible to provide answers tothe problem.

3.3.3 Formulation of Hypothesis in Exploratory Research

The quickest and the cheapest way to formulate a hypothesis in exploratory research is by using any of the four methods:

1. **Literature Search :** This refers to "referring to a literature to develop a new hypothesis".The literature referred are – trade journals, professional journals, market research finding publications, statistical publications etc. For example, suppose a problem is "Why are sales down?" This can quickly be analysed with the help of published data which should indicate, "whether the problem" is an "industry problem" or a "firm problem". Three possibilities exist to formulate the hypothesis.

   - The company's market share has declined but industry's figures are normal.
   - The industry is declining and hence the company's market share is also declining.
   - The industry's share is going up but the company's share is declining.

   If we accept the situation that our company's sales are down despite the market showing an upward trend, then we need to analyze the marketing mix variables.

2. **Experience Survey :** In experience surveys, it is desirable to talk to persons who are well informed in the area being investigated. These people may be company executives or persons outside the

organization. Here, no questionnaire is required. The approach adopted in an experience survey should be highly unstructured, so that the respondent can give divergent views.

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3. **Focus Group :** Another widely used technique in exploratory research is the focus group. In a focus group, a small number of individuals are brought together to study and talk about some topic of interest. The discussion is co-ordinated by a moderator. The group usually is of 8-12 persons. While selecting these persons, care has to be taken to see that they should have a common background and have similar experiences in buying. This is required because there should not be a conflict among the group members on the common issues that are being discussed. During the discussion, future buying attitudes, present buying opinion, etc., are gathered.

   The following should be the characteristics of a moderator/ facilitator:

   - **Listening :** He must have a good listening ability. The moderator must not miss the participant's comment, due to lack of attention.
   - **Permissive :** The moderator must be permissive, yet alert to the signs that the group is disintegrating.
   - **Memory :** He must have a good memory. The moderator must be able to remember the comments of the participants. Example: A discussion is centered around a new advertisement by a telecom company. The participant may make a statement early and make another statement later, which is opposite to what was said earlier. **Example**: The participant may say that s(he) never subscribed to the views expressed in the advertisement by the competitor, but subsequently may say that the "current advertisement of competitor is excellent".
   - **Encouragement :** The moderator must encourage unresponsive members to participate.

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- **Learning :** He should be a quick learner.
- **Sensitivity :** The moderator must be sensitive enough to guide the group discussion.
- **Intelligence :** He must be a person whose intelligence is above the average.
- **Kind/firm** : He must combine detachment with empathy.

3.3.4 Secondary Data

Secondary data is information gathered for purposes other than the completion of a research project. A variety of secondary information sources is available to the researcher gathering data on an industry, potential product applications and the market place. Secondary data is also used to gain initial insight into the research problem.

Secondary data analysis saves time that would otherwise be spent collecting data and, particularly in the case of quantitative data, provides larger and higher-quality databases than would be unfeasible for any individual researcher to collect on their own. In addition to that, analysts of social and economic change consider secondary data essential, since it is impossible to conduct a new survey that can adequately capture past change and/or developments.

Secondary data can be obtained from two different research strands:

1. **Quantitative :** Census, housing, social security as well as electoral statistics and other related databases.
2. **Qualitative :** Semi-structured and structured interviews, focus groups transcripts, field notes, observation records and other personal, research-related documents.

3.3.5 Qualitative Research

Qualitative research seeks out the 'why', not the 'how' of its topic through the analysis of unstructured information – things like interview

transcripts, e-mails, notes, feedback forms, photos and videos. It doesn't just rely on statistics or numbers, which are the domain of quantitative researchers. Qualitative research is used to gain insight into people's attitudes, behaviours, value systems, concerns, motivations, aspirations, culture or life-styles. It's used to inform business decisions policy formation, communication and research. Focus groups, in-depth interviews, content analysis and semiotics are among the many formal approaches that are used, but qualitative research also involves the analysis of any unstructured material, including customer feedback forms, reports or media clips.

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3.4 Descriptive Research Design

The name itself reveals that, it is essentially a research to describe something. For example, I can describe the characteristics of a group such as – customers, organisations, markets, etc Descriptive research provides "association between two variables" like income and place of shopping, age and preferences Descriptive inform us about the proportions of high and low income customers in a particular territory. What descriptive research cannot indicate is that it cannot establish a cause and effect relationship between the characteristics of interest. This is the distinct disadvantage of descriptive research.

Check Your Progress

What do you see as the reason behind Latin Square Design testing only one variable?

Descriptive study requires a clear specification of "Who, what, when, where, why and how" of the research. For example, consider a situation of convenience stores (food world) planning to open a new outlet. The company wants to determine, "How people come to patronize a new outlet?"

3.4.1 Types of Descriptive Studies

There are two types of descriptive research:

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1. **Longitudinal Study :** These are the studies in which an event or occurrence is measured and again over a period of time. This is also known as "Time Series Study". Through longitudinal study, the researcher comes to know how the market changes over time. Longitudinal studies involve panels. Panel once constituted will have certain elements. These elements may be individuals, stores, dealers, etc. The panel or sample remains constant throughout the period. There may be some dropouts and additions. The sample members in the panel are being measured repeatedly. The periodicity of the study may be monthly or quarterly etc.

2. **Cross-sectional Study :** Cross-sectional study is one of the most important types of descriptive research; it can be done in two ways:

   (a) Field study: This includes a depth study. Field study involves an in-depth study of a problem, such as reaction of young men and women towards a product.

   Example: Reaction of Indian men towards branded ready-to-wear suit. Field study is carried out in real world environment settings. Test marketing is an example of field study.

   (b) Field survey : Large samples are a feature of the study. The biggest limitations of this survey are cost and time. Also, if the respondent is cautious, then he might answer the questions in a different manner. Finally, field survey requires good knowledge.

3.4.2 Survey

The survey is a research technique in which data are gathered by asking questions of respondents. Survey research is one of the most important areas of measurement in applied social research. The broad area of survey research encompasses any measurement procedures that

involve asking questions of respondents. A "survey" can be anything forms a short paper-and-pencil feedback form to an intensive one-on-one in-depth interview.

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3.4.3 Observation Studies

An observational study draws inferences about the possible effect of a treatment on subjects, where the assignment of subjects into a treated group versus a control group is outside the control of the investigator. This is in contrast with controlled experiments, such as randomized controlled trials, where each subject is randomly assigned to a treated group or a control group before the start of the treatment. Observational studies are sometimes referred to as natural experiments or as quasi-experiments. These differences in terminology reflect certain differences in emphasis, but a shared theme is that the early stages of planning or designing an

3.5 Difference between Exploratory Research and Descriptive Research

Exploatory Researh	**Desciptive Research**
It is concerned with the "Why" aspect of consumer behaviour i.e., it tries to understand the problem and not measure the result.	It is concerned with the "What", "When" or "How often" on the consumer behavior.
This research does not require large samples	This needs large samples of respondents.
Sample need not to represent the population	Sample must be representative of population.

Due to imprecise statement, data collection is not easy.	Statement is precise. Therefore data collection is easy
Characteristics of interest to be measured are not clear.	Characteristics of interest to be measured are clear.
There is no need for a questionnaire for collecting the data.	There should be a properly designed questionnaire for data collection.
Data collection methods are: Focus group Literature Searching Case study	Use of panel data Longitudinal Cross-sectional studies

3.6 Causal Research Design

Causal Research are the studies that engage in hypotheses testing usually explain the nature of certain relationships, or establish the differences among groups or the independence of two or more factors in a situation. A research design in which the major emphasis is on determining the cause-and-effect relationship. The research is used to measure what impact a specific change will have on existing norms and allows market researchers to predict hypothetical scenarios upon which a company can base its business plan.

3.7 Summary

- There are primarily four types of research namely exploratory research, descriptive research, Casual and experimental research.
- Exploratory research helps the researcher to become familiar with the problem. It helps to establish the priorities for further research. It may or may not be possible to formulate Hypothesis during exploratory stage.

- To get an insight into the problem, literature search, experience surveys, focus groups, and selected case studies assist in gaining insight into the problem.
- The role of moderator or facilitator is extremely important in focus group. There are several variations in the formation of focus group.
- Descriptive research is rigid. This type of research is basically dependent on hypothesis.
- Descriptive research is used to describe the characteristics of the groups. It can also be used forecasting or prediction.
- Panel data is used in longitudinal studies. There are two different types of panels. True panel and Omnibus panel. In true panel same measurement are made during period of time. In Omnibus panel different measurement are made during a period of time.
- Cross-sectional studies involve field study and field survey, the difference being the size of sample.
- Causal research is conducted mainly to prove the fact that one factor "X" the cause was responsible for the effect "Y".
- While conducting experiment, the researcher must guard against extraneous source of error. This may confound the experiment.

3.8 Key Terms

Causal Research : A research designed to determine cause and effect relationship.

Conclusive Research : This is a research having clearly defined objectives. In this type of research specific courses of action are taken to solve the problem.

Concomitant Variation : It is the extent to which cause and effect vary together.

Descriptive Research : It is essentially a research to describe something.

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Ex-post Facto Research : Study of the current state and factors causing it.

Extraneous Variable : These variables affect the response of test units. Also known as confounding variable.

Field Study : Field study involves an in-depth study of a problem, such as reaction of young men and women towards a product.

Literature Research : It refers to "referring to a literature to develop a new hypothesis".

Longitudinal Study : These are the studies in which an event or occurrence is measured again and again over a period of time.

3.9 Review Questions

1. Can all causal research hypotheses be studied? Why or why not?
2. For each of the situation mentioned below, state whether the research should be exploratory, descriptive or causal and why
    a) To find out the relationship between promotion and sales.
    b) To find out the consumer reaction regarding use of new detergents which are **Notes** economical
    c) To identify the target market demographics, for a shopping mall.
    d) Estimate the sales potential for ready-to-eat food in the northeastern parts of India.
3. In your analysis, what are the advantages and disadvantages of panel data?
4. What do you see as the reason behind Latin Square Design testing only one variable?
5. Do you see any benefit of factorial design over that of before-after design? Support your answer with reasons.

6. Is it necessary for the researcher to mention about the bibliographies and appendices? Why/why not?
7. Illustrate advantages of experience survey by the help of examples.
8. Why is an exploratory research used in the initial stages of research?
9. Which type of research would you use to generate new product ideas and why?
10. Which type of research study would you use to determine the characteristics of market?

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Check your progress

1. ..... research is used to seek insights into general nature of the problem.
2. Research design helps to plan in advance the methods and techniques to be used for collecting and ……..data.
3. The major emphasis in exploratory research is on converting ....., vague problem statements into ..... and ..... sub-problem statements.
4. Exploratory research is ..... and very .....
5. In experience surveys, it is desirable to talk to persons who are well informed in the area being .....
6. Most of the companies conducting the ..... groups first screen the candidates to determine who will compose the particular group.
7. The moderator must not miss the ..... comment.
8. The moderator must encourage ..... members to participate.
9. ..... studies are the studies in which an event

or occurrence is measured again and again over a period of time.

10. Longitudinal study is also known as .....
11. True panel involves ..... measurement of the same variables.
12. The biggest limitations of field survey are ..... and .....
13. …….research requires large samples.
14. In …….research, there is no need for a questionnaire for collecting the data.
15. ……. research is a way of seeing how actions now will affect a business in the future.
16. Synopsis is an abstract form of research which underlines the research procedure followed and is presented before the guide for evaluating its …….
17. Explanatory variable are the variables whose effects, researcher wishes to .....
18. ……are units, on which the experiment is carried out.
19. ……..design helps to determine the effect of each of the variables and also measure the interacting effect of the several variables.

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Answers:

1. Exploratory 2. Analyzing 3. broad, small, precise 4. flexible, versatile 5. investigated 6. Focus 7. participant 8. Unresponsive 9. Longitudinal 10. 'Time Series Study' 11. repeat 12. cost, time 13.. Descriptive 14. exploratory15. Causal 16. Potentiality 17. examine 18. Test units 19. Factorial

3.10 Further Reading

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UNIT 4 : SAMPLING DESIGN

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4.0 Unit Objectives

After studying this unit, you will be able to:

- Describe the conception of sampling
- Steps involved in the sampling design
- Identify the characteristics of good sampling design
- State the different types of sampling design
- Report about the probability and non-probability sampling
- Explain the various types of errors in sampling

4.1 Introduction

Sampling is the process of selecting units (e.g., people, organizations) from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen. Each observation measures one or more properties (weight, location, etc.) of an observable entity enumerated to distinguish objects or individuals. Survey weights often need to be applied to the data to adjust for the sample design. Results from probability theory and statistical theory are employed to guide practice.

4.2 Sampling – An Introduction

A sample is a part of a target population, which is carefully selected to represent the population. Sampling frame is the list of elements from which the sample is actually drawn. Actually, sampling frame is nothing but the correct list of population.

Example : Telephone directory, Product finder, Yellow pages.

The sampling process comprises several stages:

1. Defining the population of concern
2. Specifying a sampling frame, a set of items or events possible to

measure

3. Specifying a sampling method for selecting items or events from the frame
4. Determining the sample size
5. Implementing the sampling plan
6. Sampling and data collecting
7. Reviewing the sampling process

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4.2.1 Distinction between Census and Sampling

Census refers to complete inclusion of all elements in the population. A sample is a sub-group of the population.

When is a Census Appropriate?

1. A census is appropriate if the size of population is small.

Example: A researcher may be interested in contacting firms in iron and steel or petroleum products industry. These industries are limited in number, so a census will be suitable.

2. Sometimes, the researcher is interested in gathering information from every individual.

Example: Quality of food served in a mess.

When is Sample Appropriate?

1. When the size of population is large.

2. When time and cost are the main considerations in research.

3. If the population is homogeneous.

Also, there are circumstances when a census is not possible.

Example : Reactions to global advertising by a company.

Check Your Progress

What do you analyse as the advantages and disadvantages of probability sampling?

4.3 Steps of Sampling Design

Sampling process consists of seven steps. They are:

1. Define the population

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2. Identify the sampling frame
3. Specify the sampling unit
4. Selection of sampling method
5. Determination of sample size
6. Specify sampling plan
7. Selection of sample

1. Define the population :

Population is defined in terms of :

(a) Elements

(b) Sampling units

(c) Extent

(d) Time.

Example : If we are monitoring the sale of a new product recently introduced by a company, say (shampoo sachet) the population will be:

(a) Element - Company's product

(b) Sampling unit - Retail outlet, super market

(c) Extent - Hyderabad and Secunderabad

(d) Time - April 10 to May 10, 2016

2. Identify the sampling frame :

Sampling frame could be

(a) Telephone Directory

(b) Localities of a city using the municipal corporation listing

(c) Any other list consisting of all sampling units.

Example : You want to learn about scooter owners in a city. The RTO will be the frame, which provides you names, addresses and the types of vehicles possessed.

3. Specify the sampling unit :

Individuals who are to be contacted are the sampling units. If retailers are to be contacted in a locality, they are the sampling units.

Sampling unit may be husband or wife in a family. The selection of sampling unit is very important. If interviews are to be held during office timings, when the heads of families and other employed persons are away, interviewing would under-represent employed persons, and over-represent elderly persons, housewives and the unemployed.

4. Selection of sampling method :

This refers to whether (a) probability or (b) non-probability methods are used.

5. Determine the sample size :

This means we need to decide "how many elements of the target population are to be chosen?" The sample size depends upon the type of study that is being conducted. For example: If it is an exploratory research, the sample size will be generally small. For conclusive research, such as descriptive research, the sample size will be large. The sample size also depends upon the resources available with the company.

6. Specify the sampling plan :

A sampling plan should clearly specify the target population. Improper defining would lead to wrong data collection.

Example : This means that, if a survey of a household is to be conducted, a sampling plan should define a "household" i.e., "Does the household consist of husband or wife or both", minors etc., "Who should be included or excluded." Instructions to the interviewer should include "How he should obtain a systematic sample of households, probability sampling non-probability sampling". Advise him on what he should do to the household, if no one is available.

7. Select the sample :

This is the final step in the sampling process.

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4.3.1 Characteristics of a Good Sample Design

A good sample design requires the judicious balancing of four broad criteria - goal orientation, measurability, practicality and economy.

1. Goal orientation :

This suggests that a sample design "should be oriented to the research objectives, tailored to the survey design, and fitted to the survey conditions". If this is done, it should influence the choice of the population, the measurement as also the procedure of choosing a sample.

2. Measurability :

A sample design should enable the computation of valid estimates of its sampling variability. Normally, this variability is expressed in the form of standard errors in surveys. However, this is possible only in the case of probability sampling. In non-probability samples, such a quota sample, it is not possible to know the degree of precision of the survey results.

3. Practicality :

This implies that the sample design can be followed properly in the survey, as envisaged earlier. It is necessary that complete, correct, practical, and clear instructions should be given to the interviewer so that no mistakes are made in the selection of sampling units and the final selection in the field is not different from the original sample design. Practicality also refers to simplicity of the design, i.e. it should be capable of being understood and followed in actual operation of the field work.

4. Economy :

Finally, economy implies that the objectives of the survey should be achieved with minimum cost and effort. Survey objectives are generally

spelt out in terms of precision, i.e. the inverse of the variance of survey estimates. For a given degree of precision, the sample design should give the minimum cost. Alternatively, for a given per unit cost, the sample design should achieve maximum precision (minimum variance).

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4.4 Types of Sample Design

Sampling is divided into two types: Probability sampling: In a probability sample, every unit in the population has equal chances for being selected as a sample unit. Non-probability sampling: In the non-probability sampling, the units in the population have unequal or negligible, almost no chances for being selected as a sample unit.

4.4.1 Probability Sampling Techniques

1. Random sampling.
2. Systematic random sampling.
3. Stratified random sampling.
4. Cluster sampling.
5. Multistage sampling.

1. Random Sampling

Simple random sample is a process in which every item of the population has an equal probability of being chosen.

In random sampling, there are two possibilities:

(a) Equal probability

(b) Varying probability.

(a) Equal Probability: This is also called as the random sampling with replacement.

2. Systematic Random Sampling

In systematic random sampling first item was randomly selected. The rest are systematically selected. This is a very popular method because

we need only one random number.

3. Stratified Random Sampling

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A probability sampling procedure in which simple random sub-samples are drawn from within different strata that are, more or less equal on some characteristics. Stratified sampling is of two types:

A. Proportionate stratified sampling: The number of sampling units drawn from each stratum is in proportion to the population size of that stratum.

B. Disproportionate stratified sampling: The number of sampling units drawn from each stratum is based on the analytical consideration, but not in proportion to the size of the population of that stratum. Sampling process is as follows:

1. The population to be sampled is divided into groups (stratified).
2. A simple random sample is chosen.

4. Cluster Sampling :

The following steps are followed:

1. The population is divided into clusters.
2. A simple random sample of few clusters is selected.
3. All the units in the selected cluster are studied.

4.4.2 Non-probability Sampling Techniques

1. Deliberate sampling
2. Shopping mall intercept sampling
3. Sequential sampling
4. Quota sampling
5. Snowball sampling
6. Panel samples

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1. Deliberate or Purposive Sampling

This is also known as the judgment sampling. The investigator uses his discretion in selecting sample observations from the universe. As a result, there is an element of bias in the selection. From the point of view of the investigator, the sample thus chosen may be a true representative of the universe. However, the units in the universe do not enjoy an equal chance of getting included in the sample. Therefore, it cannot be considered a probability sampling.

2. Shopping Mall Intercept Sampling

This is a non-probability sampling method. In this method the respondents are recruited for individual interviews at fixed locations in shopping malls.

3.Sequential Sampling

This is a method in which the sample is formed on the basis of a series of successive decisions. They aim at answering the research question on the basis of accumulated evidence. Sometimes, a researcher may want to take a modest sample and look at the results. Thereafter, s(he) will decide if more information is required for which larger samples are considered. If the evidence is not conclusive after a small sample, more samples are required. If the position is still inconclusive, still larger samples are taken. At each stage, a decision is made about whether more information should be collected or the evidence is now sufficient to permit a conclusion.

4. Snowball Sampling

This is a non-probability sampling. In this method, the initial group of respondents are selected randomly. Subsequent respondents are being selected based on the opinion or referrals provided by the initial respondents. Further referrals will lead to more referrals, thus leading to a snowball sampling. The referrals will have demographic

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and psychographic characteristics that are relatively similar to the person referring them.

Example: College students bring in more students on the consumption of Pepsi. The major advantage of snowball sampling is that it monitors the desired characteristics in the population.

5. Panel Samples

Panel samples are frequently used in marketing research. To give an example, suppose that one is interested in knowing the change in the consumption pattern of households. A sample of households is drawn. These households are contacted to gather information on the pattern of consumption. Subsequently, say after a period of six months, the same households are approached once again and the necessary information on their consumption is collected.

4.4.3 Distinction between Probability Sample and Non-probability Sample Probability Sample

1. Here, each member of a universe has a known chance of being selected and included in the sample.

2. Any personal bias is avoided. The researcher cannot exercise his discretion in the selection of sample items.

Example: Random sample and cluster sample.

Non-probability Sample

In this case, the likelihood of choosing a particular universe element is unknown. The sample chosen in this method is based on aspects like convenience, quota etc.

Example: Quota sampling and Judgment sampling.

Difference between Cluster Sampling and Stratified Random Sampling

The major difference between cluster sampling and stratified sampling lies with the inclusion of the cluster or strata. In stratified random sampling, all the strata of the population is sampled while in cluster sampling, the researcher merely randomly selects a number of clusters from the collection of clusters of the entire population. Thus, only a number of clusters are sampled, all the other clusters are left unrepresented. The other notable differences between Cluster and Stratified random sampling are as follows:

- When natural groupings are clear in a statistical population, cluster sampling technique is used. While Stratified sampling is a method where in, the member of a group are grouped into relatively homogeneous groups.
- Cluster sampling can be chosen if the group consists of homogeneous members. On the other hand, for heterogeneous members in the groups, stratified sampling is a good option.
- The benefit of cluster sampling over other sampling methods is, it is cheaper as compared to the other methods. While the benefits of stratified sampling are, this method ignores the irrelevant ones and focuses on the vital sub populations. Another advantage is, with stratified random sampling method is that for different sub populations, the researcher can opt for different sampling techniques. The stratified sampling method as well helps in improving the efficiency and accuracy of the estimation and facilitates greater balancing of statistical power of tests.
- The major disadvantage of cluster sampling is, it initiates higher sampling error. This sampling error may be represented as design effect. The disadvantages of stratified random sampling method are, it calls for choice of relevant stratification variables which can be tough at times. When there are homogeneous

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Check Your Progress

Shopping Mall Intercept Sampling is not considered a scientific approach. Why?

subgroups, random sampling method is not much useful. The implementation of random sampling method is expensive and If not provided with correct information about the population, then an error may be introduced.

- All strata are represented in the sample; but only a subset of clusters are in the sample.

4.5 Fieldwork

The fieldwork consists of informal conversations as well as formal standardized interviews, including projective or questionnaires. Initially, a single person conducted the research. Changes in society have shifted research for the most part into teamwork. However, a single person can still conduct effective research. Traditionally, educational researchers began their research with a set of hypothesis, whereas the fieldworker's hypothesis emerges through the fieldwork. Fieldwork in its inception may seem to be disorganized. The notes may be scattered, information is coming from all over the place. That is because the hypothesis has not yet emerged. Even though, at times the hypothesis may become very clear rapidly.

Once the hypothesis became evident the fieldworker maintains an open mind thus allowing other hypothesis to emerge. Another important difference between the types of research is the "nature of the proposition sought: his propositions are rarely of the A causes B type, the usual casual interrelationships between two or more variables dealt with in an experimental research". Much of the naturalistic data is collected by using raw materials: notes stating the actual response given. In order to be accurate recorders are often used. Experienced researchers create their own techniques and develop the ability to remember the information that needs to be recorded.

4.6 Errors in Sampling

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4.6.1 Sampling Error

The only way to guarantee the minimization of sampling error is to choose the appropriate sample size. As the sample keeps on increasing, the sampling error decreases. Sampling error is the gap between the sample mean and population mean.

4.6.2 Non-sampling Error

One way of distinguishing between the sampling and the non-sampling error is that, while sampling error relates to random variations which can be found out in the form of standard error, non-sampling error occurs in some systematic way which is difficult to estimate.

4.6.3 Sampling Frame Error

A sampling frame is a specific list of population units, from which the sample for a study being chosen.

4.6.4 Non-response Error

This occurs, because the planned sample and final sample vary significantly.

Example: Marketers want to know about the television viewing habits across the country. They choose 500 households and mail the questionnaire. Assume that only 200 respondents reply. This does not show a non-response error, which depends upon the discrepancy. If those 200 who replied did not differ from the chosen 500, there is no non-response error. Consider an alternative. The people who responded are those who had plenty of leisure time. Therefore, it is implied that non-respondents do not have adequate leisure time. In this case, the

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final sample and the planned sample differ. If it was assumed that all the 500 chosen have leisure time, but in the final analysis only 200 have leisure time and not others. Therefore, a sample with respect to leisure time leads to response error.

Guidelines to Increase the Response Rate

Every researcher likes to get maximum possible response from the respondents, and will be most delighted if cent percent respondent unfortunately, this does not happen. The non-response error can be reduced by increasing the response rate. Higher the response rate, more accurate and reliable is the data. In order to achieve this, some useful hints could be as follows:

1. Intimate the respondents in advance through a letter. This will improve the preparedness.
2. Personalized questionnaire should be accompanied by a covering letter.
3. Ensure/Assure that confidentiality will be maintained
4. Questionnaire length is to be restricted
5. Increase of personal interview, I.D. card is essential to prove the bona fide.
6. Monetary incentives are gifts will act as motivator
7. Reminder/Revisits would help.
8. Send self addressed/stamped envelope to return the completed questionnaire.

4.6.5 Data Error

This occurs during the data collection, analysis of data or interpretation. Respondents sometimes give distorted answers unintentionally for questions which are difficult, or if the question is exceptionally long and the respondent may not have answer. Data errors can also occur depending on the physical and social characteristics of

the interviewer and the respondent. Things such as the tone and voice can affect the responses. Therefore, we can say that the characteristics of the interviewer can also result in data error. Also, cheating on the part of the interviewer leads to data error. Data errors can also occur when answers to open-ended questions are being improperly recorded.

4.7 Sampling Distribution

A sampling distribution is the probability distribution of a given statistic based on a random sample of certain size n. It may be considered as the distribution of the statistic for all possible samples of a given size. The sampling distribution depends on the underlying distribution of the population, the statistic being considered, and the sample size used. The sampling distribution is frequently opposed to the asymptotic distribution, which corresponds to the limit case.

Example: Consider a normal population with mean and variance. Assume we repeatedly take samples of a given size from this population and calculate the arithmetic mean for each sample – this statistic is called the sample mean. Each sample will have its own average value, and the distribution of these averages will be called the "sampling distribution of the sample mean". This distribution will be normal N(m, s2/n) since the underlying population is normal. The standard deviation of the sampling distribution of the statistic is referred to as the standard error of that quantity.

4.8 Summary

- Sample is a representative of population while Census represents cent percent of population.
- The most important factors distinguishing whether to choose sample

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or census is cost and time. There are seven steps involved in selecting the sample.

- There are two types of sample, namely, Probability sampling and Non-probability sample.
- Probability sampling includes random sampling, stratified random sampling systematic sampling, cluster sampling, Multistage sampling.
- Random sampling can be chosen by Lottery method or using random number table.
- Samples can be chosen either with equal probability or varying probability.
- Random sampling can be systematic or stratified.
- In systematic random sampling, only the first number is randomly selected. Then by adding a constant "K" remaining numbers are generated.
- In stratified sampling, random samples are drawn from several strata, which has more or less same characteristics.
- In multistage sampling, sampling is drawn in several stages.

4.9 Key Terms

Census: It refers to complete inclusion of all elements in the population. A sample is a sub-group of the population.

Deliberate Sampling: The investigator uses his discretion in selecting sample observations from the universe. As a result, there is an element of bias in the selection.

Quota sampling :is quite frequently used in marketing research. It involves the fixation of certain quotas, which are to be fulfilled by the interviewers.

Random Sampling: Simple random sample is a process in which every item of the population has an equal probability of being chosen.

Sample Frame: Sampling frame is the list of elements from which the sample is actually drawn.

Stratified Random Sampling: A probability sampling procedure in which simple random subsamples are drawn from within different strata, that are, more or less equal on some characteristics.

4.10 Review Questions

1. What do you analyse as the advantages and disadvantages of probability sampling?
2. Which method of sampling would you use in studies, where the level of accuracy can vary from the prescribed norms and why?
3. Shopping Mall Intercept Sampling is not considered a scientific approach. Why?
4. Quota sampling does not require prior knowledge about the cell to which each population unit belongs. Does this attribute serve as an advantage or disadvantage for Quota Sampling?
5. What suggestions would you give to reduce non sampling error?
6. One mobile phone user is asked to recruit another mobile phone user. What sampling method is this known as and why?
7. Sampling is a part of the population. True/False? Why/why not?
8. Determine the sample size if the standard deviation of population is 20 and the standard error is 4.1.
9. What do see as the reason behind purposive sampling being known as judgement sampling?

Check your progress :

1. A sample is a part of a ..... population.
2. Sampling ..... is the list of elements from which the sample is actually drawn.

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3. A sample is appropriate when the size of population is ..... and .....
4. A census is appropriate if the size of population is .....
5. A sampling plan should clearly specify the ..... population.
6. The sample size depends upon the ..... available with the company.
7. Sampling is divided into two types, viz. ..... and .....
8. There are ..... methods used in the random sampling.
9. ..... is also called as the random sampling with replacement.
10. ..... is also called random sampling without replacement.
11. Stratified sampling can be carried out with ..... proportion across the strata proportionate stratified sample.
12. Fieldwork in its inception may seem to be .....
13. ..... researchers create their own techniques and develop the ability to remember the information that needs to be recorded.
14. The only way to guarantee the minimization of sampling error is to choose the appropriate .....
15. A ..... is a specific list of population units, from which the sample for a study being chosen.
16. The ..... error can be reduced by increasing the response rate.
19. Sampling distribution depends on the underlying distribution of the ....., the statistic being considered, and the sample size used.
20. The standard deviation of the sampling distribution of the statistic is referred to as the ..... of that quantity.

Answers:

1. target 2. Frame 3. large, homogeneous 4. Small 5. target 6. Resources 7. probability, non-probability 8. Two 9. Equal Probability 10. Varying Probability 11. same 12. Disorganized 13. Experienced 14. sample size 15. sampling frame 16. non response 17. larger 18. Precision 19. population 20. standard error.

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4.11 Further Reading

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UNIT 5: MEASUREMENT AND SCALING TECHNIQUES

NOTES

5.0 Unit Objectives

After studying this unit, you will be able to:

- Recognize the tools of sound measurement
- Explain the techniques of developing measurement tools
- Describe the meaning and techniques of scaling
- Differentiate among Comparative and non-comparative scales
- Describe the Multi-dimensional scaling techniques

5.1 Introduction

Measurement is assigning numbers or other symbols to characteristics of objects being measured, according to predetermined rules. Concept (or Construct) is a generalized idea about a class of objects, attributes, occurrences, or processes. Relatively concrete constructs comprises of aspects such as Age, gender, number of children, education, income. Relatively abstract constructs take into accounts the aspects such as Brand loyalty, personality, channel power, satisfaction.

Scaling is the generation of a continuum upon which measured objects are located.

Scale is a quantifying measure – a combination of items that is progressively arranged according to value or magnitude. The purpose is to quantitatively represent an item's, person's, or event's place in the scaling continuum.

5.2 Measurement Scales: Tools of Sound Measurement

These are of four kinds of scales, namely:

1. Nominal scale

2. Ordinal scale

3. Interval scale

4. Ratio scale

5.2.1 Nominal Scale

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In this scale, numbers are used to identify the objects. For example, University Registration numbers assigned to students, numbers on their jerseys. The purpose of marking numbers, symbols, labels etc. in this type of scaling is not to establish an order but it is to simply put labels in order to identify events and count the objects and subjects. This measurement scale is used to classify individuals, companies, products, brands or other entities into categories where no order is implied. Indeed, it is often referred to as a categorical scale. It is a system of classification and does not place the entity along a continuum. It involves a simple count of the frequency of the cases assigned to the various categories, and if desired numbers can be nominally assigned to label each category.

Characteristics

1. It has no arithmetic origin.

2. It shows no order or distance relationship.

3. It distinguishes things by putting them into various groups.

Use: This scale is generally used in conducting in surveys and ex-post-facto research.

Example: Have you ever visited Bangalore?

Yes-1

No-2

'Yes' is coded as 'One' and 'No' is coded as 'Two'. The numeric attached to the answers has no meaning, and is a mere identification. If numbers are interchanged as one for 'No' and two for 'Yes', it won't

Check Your Progress

What do you analyse as the merits of Thurstone Scale?

affect the answers given by respondents. The numbers used in nominal scales serve only the purpose of counting.

The telephone numbers are an example of nominal scale, where one number is assigned to one subscriber. The idea of using nominal scale is to make sure that no two persons or objects receive the same number. Similarly, bus route numbers are the example of nominal scale.

"How old are you"? This is an example of a nominal scale.

5.2.2 Ordinal Scale (Ranking Scale)

The ordinal scale is used for ranking in most market research studies. Ordinal scales are used to ascertain the consumer perceptions, preferences, etc. Ordinal scale is used to arrange things in order. In qualitative researches, rank ordering is used to rank characteristics units from the highest to the lowest.

Characteristics

1. The ordinal scale ranks the things from the highest to the lowest.
2. Such scales are not expressed in absolute terms.
3. The difference between adjacent ranks is not equal always.
4. For measuring central tendency, median is used.
5. For measuring dispersion, percentile or quartile is used.

Scales involve the ranking of individuals, attitudes or items along the continuum of the characteristics being scaled.

From the information provided by ordinal scale, the researcher knows the order of preference but nothing about how much more one brand is preferred to another i.e., there is no information about the interval between any two brands. All of the information, a nominal scale would have given, is available from an ordinal scale. In addition, positional statistics such as the median, quartile and percentile can be determined. It

is possible to test for order correlation with ranked data. The two main methods are Spearman's Ranked Correlation Coefficient and Kendall's Coefficient of Concordance.

5.2.3 Interval Scale

Interval scale is more powerful than the nominal and ordinal scales. The distance given on the scale represents equal distance on the property being measured. Interval scale may tell us "How far the objects are apart with respect to an attribute?" This means that the difference can be compared. The difference between "1" and "2" is equal to the difference between "2" and "3".

Interval scale uses the principle of "equality of interval" i.e., the intervals are used as the basis for making the units equal assuming that intervals are equal. It is only with an interval scaled data that researchers can justify the use of the arithmetic mean as the measure of average. The interval or cardinal scale has equal units of measurement thus, making it possible to interpret not only the order of scale scores but also the distance between them. However, it must be recognized that the zero point on an interval scale is arbitrary and is not a true zero. This, of course, has implications for the type of data manipulation and analysis we can carry out on data collected in this form. It is possible to add or subtract a constant to all of the scale values without affecting the form of the scale but one cannot multiply or divide the values. It can be said that two respondents with scale positions 1 and 2 are as far apart as two respondents with scale positions 4 and 5, but not that a person with score 10 feels twice as strongly as one with score 5. Temperature is interval scaled, being measured either in Centigrade or Fahrenheit. We cannot speak of 50°F being twice as hot as 25°F since the corresponding temperatures on the centigrade scale, 100°C and -3.9°C, are not in the ratio 2:1.

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Interval scales may be either numeric or semantic.

Characteristics

1. Interval scales have no absolute zero. It is set arbitrarily.
2. For measuring central tendency, mean is used.
3. For measuring dispersion, standard deviation is used.
4. For test of significance, t-test and f-test are used.
5. Scale is based on the equality of intervals.

5.2.4 Ratio Scale

Ratio scale is a special kind of internal scale that has a meaningful zero point. With this scale, length, weight or distance can be measured. In this scale, it is possible to say, how many times greater or smaller one object is being compared to the other.

This scale is used to measure actual variables. The highest level of measurement is a ratio scale. This has the properties of an interval scale together with a fixed origin or zero point.

Examples of variables which are ratio scaled include weights, lengths and times. Ratio scales permit the researcher to compare both differences in scores and in the relative magnitude of scores. For instance, the difference between 5 and 10 minutes is the same as that between 10 and
15 minutes, and 10 minutes is twice as long as 5 minutes.

Characteristics

1. This scale has an absolute zero measurement.
2. For measuring central tendency, geometric and harmonic means are used.

Use: Ratio scale can be used in all statistical techniques.

5.3 Techniques of Developing Measurement Tools

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The scale construction techniques are used for measuring the attitude of a group or an individual. In other words, scale construction technique helps in estimate the interest or behaviour of an individual or a group towards others or another's environment rather than oneself. While performing a scale construction technique, you need to consider various decisions related to the attitude of the individual or group. A few of these decisions are:

- Determining the level of the involved data; identifying whether it is nominal, ordinal, interval or ratio.
- Identifying the useful statistical analysis for the scale construction.
- Identifying the scale construction technique to be used.
- Selecting the physical layout of the scales.
- Determining the scale categories that need to be used.

There are two primary scale construction techniques, comparative and non-comparative. The comparative technique is used to determine the scale values of multiple items by performing comparisons among the items. In the non-comparative technique, scale value of an item is determined without comparing with another item. Furthermore, these two techniques are also of many types. The various types of comparative techniques are:

1. **Pairwise comparison scale:** This is an ordinal level scale construction technique, where a respondent is provided with two items and then asked him to select his/her choice.
2. **Rasch model scale:** In this technique, multiple respondents are simultaneously involved with several items and from their

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responses comparisons are derived to determine the scale values.

3. **Rank-order scale**: This is also an ordinal level scale constructing technique, where a respondent is provided with multiple items, which he needs to rank accordingly.
4. **Constant sum scale:** In this scale construction technique, a respondent is usually provided with a constant amount of money, credits or points that he needs to allocate to various items for determining the scale values of the items.

The various types of non-comparative techniques are:

1. **Continuous rating scale:** In this technique, respondents generally use a series of numbers known as scale points for rating an item. This technique is also known as graphic rating scaling.
2. **Likert scale**: This technique allows the respondents to rate the items on a scale of five to seven points depending upon the amount of their agreement or disagreement on the item.
3. **Semantic differential scale:** In this technique, respondents are asked to rate the different attributes of an item on a seven-point scale.

5.4 Scaling – Meaning

Scaling is a process or set of procedures, which is used to assess the attitude of an individual. Scaling is defined as the assignment of objects to numbers according to a rule. The objects in the definition are text statements, which can be the statements of attitude or principle. Attitude of an individual is not measured directly by scaling. It is first migrated to statements and then the numbers are assigned to them. Figure below shows the how to scale the attitude of individuals.

5.5 Comparative and Non-comparative Scaling Techniques

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1. **Comparative Scales** : It involve the direct comparison of two or more objects.
2. **Non-comparative Scales** : Objects or stimuli are scaled independently of each other.

5.5.1 Comparative Scaling Techniques

Paired Comparison :

Example : Here a respondent is asked to show his preferences from among five brands of coffee – A, B, C, D and E with respect to flavours. He is required to indicate his preference in pairs. A number of pairs are calculated as follows. The brands to be rated are presented two at a time, so each brand in the category is compared once to every other brand. In each pair, the respondents were asked to divide 100 points on the basis of how much they liked one compared to the other. The score is totally for each brand.

No. of pairs = N(N-1)/2.

Rank Order Scaling

1. Respondents are presented with several objects simultaneously
2. Then asked to order or rank them according to some criterion
3. Data obtained are ordinal in nature-Arranged or ranked in order of magnitude
4. Commonly used to measure preferences among brands and brand attributes.

Constant Sum Scaling

1. Respondents are asked to allocate a constant sum of units among a set of stimulus objects with respect to some criterion

Check Your Progress

What might be the limitations of Thurstone Scale?

2. Units allocated represent the importance attached to the objects
3. Data obtained are interval in nature Notes
4. Allows for fine discrimination among alternatives.

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5.5.2 Non-comparative Scale

Continuous Rating Scale

VERY POOR …….....VERY GOOD

0 10 20 30 40 50 60 70 80 90 100

Likert Scale :

It is known as summated rating scale. This consists of a series of statements concerning an attitude object. Each statement has '5 points', Agree and Disagree on the scale. They are also called summated scales, because scores of individual items are summated to produce a total score for the respondent. The Likert Scale consists of two parts-item part and evaluation part. Item part is usually a statement about a certain product, event or attitude. Evaluation part is a list of responses like "strongly agree" to "strongly disagree". The five point-scale is used here. The numbers like +2, +1, 0, –1, –2 are used.

Semantic Differential Scale :

This is very similar to the Likert Scale. It also consists of a number of items to be rated by the respondents. The essential difference between Likert and Semantic Differential Scale is as follows:
It uses "Bipolar" adjectives and phrases. There are no statements in the Semantic Differential Scale. Each pair of adjective is separated by a seven point scale.

Multidimensional Scaling :

This is used to study consumer attitudes, particularly with respect to perceptions and preferences. These techniques help identify the

product attributes that are important to the customers and to measure their relative importance. Multi-Dimensional Scaling is useful in studying the following:

1. (a) What are the major attributes considered while choosing a product (soft drinks, modes of transportation)? (b) Which attributes do customers compare to evaluate different brands of the product? Is it price, quality, availability etc.?
2. Which is the ideal combination of attributes according to the customer? (i.e., which two or more attributes consumer will consider before deciding to buy.)
3. Which advertising messages are compatible with the consumer's brand perceptions?

Stapel Scales

1. Modern versions of the Stapel scale place a single adjective as a substitute for the semantic differential when it is difficult to create pairs of bipolar adjectives.
2. The advantage and disadvantages of a Stapel scale, as well as the results, are very similar to those for a semantic differential.

However, the stapel scale tends to be easier to conduct and administer.

5.6 Criteria for the Good Test

There are two criteria to decide whether the scale selected is good or not. They are:

1. Reliability; and

2. Validity

5.6.1 Reliability Analysis

Reliability means the extent to which the measurement process is free from errors. Reliability deals with accuracy and consistency. The scale is said to be reliable, if it yields the same results when repeated measurements are made under constant conditions.

Reliability can be ensured by using the same scale on the same set of respondents, using the same method. However, in actual practice, this becomes difficult as:

1. Extent to which a scale produces consistent results
2. Test-retest Reliability: Respondents are administered scales at 2 different times under nearly equivalent conditions
3. Alternative-form Reliability: 2 equivalent forms of a scale are constructed, then tested with the same respondents at 2 different times
4. Internal Consistency Reliability:
    (a) The consistency with which each item represents the construct of interest
    (b) Used to assess the reliability of a summated scale
    (c) Split-half Reliability
5. Items constituting the scale divided into 2 halves, and resulting half scores are correlated: Coefficient alpha (most common test of reliability)
6. Average of all possible split-half coefficients resulting from different splitting of the scale items.

5.6.2 Validity Analysis

The paradigm of validity focused in the question "Are we measuring, what we think, we are measuring?" Success of the scale lies in measuring "What is intended to be measured?" Of the two attributes of scaling, validity is the most important.

There are several methods to check the validity of the scale used for measurement:

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1. **Construct Validity**: A sales manager believes that there is a clear relation between job satisfaction for a person and the degree to which a person is an extrovert and the work performance of his sales force. Therefore, those who enjoy high job satisfaction, and have extrovert personalities should exhibit high performance. If they do not, then we can question the construct validity of the measure.
2. **Content Validity:** A researcher should define the problem clearly. Identify the item to be measured. Evolve a suitable scale for this purpose. Despite these, the scale may be criticized for being lacking in content validity. Content validity is known as face validity.
3. **Predictive Validity**: This pertains to "How best a researcher can guess the future performance from the knowledge of attitude score"?
4. **Criterion Validity:**
   (a) Examines whether measurement scale performs as expected in relation to other variables selected as meaningful criteria, i.e., predicted and actual behavior should be similar
   (b) Addresses the question of what construct or characteristic the scale is actually measuring.
5. **Convergent Validity**: Extent to which scale correlates positively with other measures of the same construct.
6. **Discriminant Validity**: Extent to which a measure does not correlate with other constructs from which it is supposed to differ.
7. **Nomological Validity:** Extent to which scale correlates in theoretically predicted ways with measures of different but related constructs.

5.7 Summary

- Measurement can be made using nominal, ordinal, interval or ratio scale.
- The scales show the extent of likes/dislikes, agreement disagreement or belief towards an object.
- Each of the scale has certain statistical implications.
- There are four types of scales used in market research namely paired comparison, Likert, semantic differential and thurstone scale.
- Likert is a five point scale whereas semantic differential scale is a seven point scale.
- Bipolar adjectives are used in semantic differential scale.
- Thurstone scale is used to assess attitude of the respondents group regarding any issue of public interest.
- Validity and reliability of the scale is verified before the scale is used for measurement.
- Validity refers to "Does the scale measure what it intends to measure".
- There are three methods to check the validity which type of validity is required depends on "What is being measured".

5.8 Key Terms

Interval Scale: Interval scale may tell us "How far the objects are apart with respect to an attribute?"

Likert Scale: This consists of a series of statements concerning an attitude object. Each statement has '5 points', Agree and Disagree on the scale.

Ordinal Scale: The ordinal scale is used for ranking in most market research studies.

Ratio Scale: Ratio scale is a special kind of internal scale that has a meaningful zero point.

Reliability: It means the extent to which the measurement process is free from errors.

5.9 Review Questions

1. What do you analyse as the merits of Thurstone Scale?
2. What might be the limitations of Thurstone Scale?
3. Which do you find to be more favorable of the attribute and non-attribute method of perceptual mapping and why?
4. In your opinion, what might be the uses of multi dimensional scaling?
5. One of the limitations of MDS can be that it keeps changing from time to time. What else than this do you see as the major drawbacks it has?
6. What can be the reasons for which you think that maintaining reliability can become difficult?
7. Does measurement scale always perform as expected in relation to other variables selected as meaningful criteria? Why/why not?
8. On an average, how many cups of tea do you drink in a day and why? Reply technically.
9. Explain the construction of
   (a) Likert scale
   (b) Semantic differential scale
   (c) Thurstone scale
10. Despite reliability, a scale may not have content validity. Comment Identify the type of scale, you will use in each of the following (ordinal, nominal, internal, ratio). Justify your answer.
11. Identify the type of scale, you will use in each of the following (ordinal, nominal, internal, ratio). Justify your answer.

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Check your progress:

1. ..... scale may tell us "How far the objects are apart with respect to an attribute?"
2. Ratio scale is a special kind of internal scale that has a meaningful .....
3. Scale construction techniques are used for measuring the …….of a group.
4. The comparative technique is used to determine the scale values of ……items by performing comparisons among the items.
7. The advantage and disadvantages of a Stapel scale, as well as the results, are very similar to those for a ..... differential.
8. ..... Scaling is used to study consumer attitudes, particularly with respect to perceptions and preferences
9. Thurstone Scale is also known as an ..... scale.
10. Semantic Differential Scale is very similar to the ..... Scale.
11. The Likert Scale consists of two parts ..... and .....
12. In ..... Scaling respondents are presented with several objects simultaneously.
13. Comparative Scales involve the direct comparison of .....objects.
14. An ..... questionnaire, which is the basis for forecasting the demand for a product has predictive validity.
15. Those who enjoy high job satisfaction, and have extrovert personalities should exhibit ..... performance.
16. Reliability deals with ..... and .....

17. There are two criteria to decide whether the scale selected is good or not, viz. ..... and .....

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Answers:

1. Interval 2. zero point 3. attitude 4. Multiple 5 Attitude 6. Hypothesis 7. semantic 8. Multidimensional 9. equal appearing interval 10. Likert 11. item part, evaluation part 12. Rank Order 13. _____ 14. _____ 15. _____ 16. _____ 17. _____

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UNIT 6: QUESTIONNAIRE DESIGN

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6.0 Unit Objectives

After studying this unit, you will be able to:

- Understand the attributes of a well-designed questionnaire, and
- Adopt a framework for developing questionnaires.

6.1 Introduction

No survey can achieve success without a well-designed questionnaire. Unfortunately, questionnaire design has no theoretical base to guide the marketing researcher in developing a flawless questionnaire. All the researcher has to guide him/her is a lengthy list of do's and don'ts born out of the experience of other researchers past and present. Hence, questionnaire design is more of an art than a science.

6.2 Questionnaire

A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents.

6.2.1 Characteristics of good questionnaire

The design of a questionnaire will depend on whether the researcher wishes to collect exploratory information (i.e. qualitative information for the purposes of better understanding or the generation of hypotheses on a subject) or quantitative information (to test specific hypotheses that have previously been generated).

Exploratory questionnaires :

If the data to be collected is qualitative or is not to be statistically

evaluated, it may be that no formal questionnaire is needed. For example, in interviewing the female head of the household to find out how decisions are made within the family when purchasing breakfast foodstuffs, a formal questionnaire may restrict the discussion and prevent a full exploration of the woman's views and processes. Instead one might prepare a brief guide, listing perhaps ten major open-ended questions, with appropriate probes/prompts listed under each.

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Formal standardized questionnaires :

If the researcher is looking to test and quantify hypotheses and the data is to be analyzed statistically, a formal standardized questionnaire is designed. Such questionnaires are generally characterized by :

- prescribed wording and order of questions, to ensure that each respondent receives the same stimuli
- prescribed definitions or explanations for each question, to ensure interviewers handle questions consistently and can answer respondents' requests for clarification if they occur
- prescribed response format, to enable rapid completion of the questionnaire during the interviewing process.

Given the same task and the same hypotheses, six different people will probably come up with six different questionnaires that differ widely in their choice of questions, line of questioning, use of open-ended questions and length. There are no hard-and-fast rules about how to design a questionnaire, but there are a number of points that can be borne in mind :

Check Your Progress

Summarize the qualities of a good questionnaire?

1. A well-designed questionnaire should meet the research objectives. This may seem obvious, but many research surveys omit important aspects due to inadequate preparatory work, and do not adequately probe particular issues due to poor

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understanding. To a certain degree some of this is inevitable. Every survey is bound to leave some questions unanswered and provide a need for further research but the objective of good questionnaire design is to 'minimise' these problems.

2. It should obtain the most complete and accurate information possible. The questionnaire designer needs to ensure that respondents fully understand the questions and are not likely to refuse to answer, lie to the interviewer or try to conceal their attitudes. A good questionnaire is organised and worded to encourage respondents to provide accurate, unbiased and complete information.

3. A well-designed questionnaire should make it easy for respondents to give the necessary information and for the interviewer to record the answer, and it should be arranged so that sound analysis and interpretation are possible.

4. It would keep the interview brief and to the point and be so arranged that the respondent(s) remain interested throughout the interview.

6.2.2 The steps preceding questionnaire design

It emphasizes that writing of the questionnaire proper should not begin before an exploratory research phase has been completed.

6.3 Process of questionnaire design

There are nine steps involved in the development of a questionnaire :

1. Decide the information required.
2. Define the target respondents.
3. Choose the method(s) of reaching your target respodents.
4. Decide on question content.
5. Develop the question wording.
6. Put questions into a meaningful order and format.

7. Check the length of the questionnaire.
8. Pre-test the questionnaire.
9. Develop the final survey form

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Deciding on the information required

It should be noted that one does not start by writing questions. The first step is to decide 'what are the things one needs to know from the respondent in order to meet the survey's objectives?' These, as has been indicated in the opening chapter of this textbook, should appear in the research brief and the research proposal.

One may already have an idea about the kind of information to be collected, but additional help can be obtained from secondary data, previous rapid rural appraisals and exploratory research. In respect of secondary data, the researcher should be aware of what work has been done on the same or similar problems in the past, what factors have not yet been examined, and how the present survey questionnaire can build on what has already been discovered. Further, a small number of preliminary informal interviews with target respondents will give a glimpse of reality that may help clarify ideas about what information is required.

Define the target respondents

At the outset, the researcher must define the population about which he/she wishes to generalise from the sample data to be collected. For example, in marketing research, researchers often have to decide whether they should cover only existing users of the generic product type or whether to also include non-users. Secondly, researchers have to draw up a sampling frame. Thirdly, in designing the questionnaire we must take into account factors such as the age, education, etc. of the target respondents.

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6.4 Choose the method(s) of reaching target respondents

It may seem strange to be suggesting that the method of reaching the intended respondents should constitute part of the questionnaire design process. However, a moment's reflection is sufficient to conclude that the method of contact will influence not only the questions the researcher is able to ask but the phrasing of those questions. The main methods available in survey research are:

- personal interviews
- group or focus interviews
- mailed questionnaires
- telephone interviews.

Within this region the first two mentioned are used much more extensively than the second pair. However, each has its advantages and disadvantages. A general rule is that the more sensitive or personal the information, the more personal the form of data collection should be.

6.5 Decide on question content

Researchers must always be prepared to ask, "Is this question really needed?" The temptation to include questions without critically evaluating their contribution towards the achievement of the research objectives, as they are specified in the research proposal, is surprisingly strong. No question should be included unless the data it gives rise to is directly of use in testing one or more of the hypotheses established during the research design.

There are only two occasions when seemingly "redundant" questions might be included:

- Opening questions that are easy to answer and which are not perceived as being "threatening", and/or are perceived as being interesting, can greatly assist in gaining the respondent's involvement in the survey and help to establish a rapport.

This, however, should not be an approach that should be overly used. It is almost always the case that questions which are of use in testing hypotheses can also serve the same functions.

- "Dummy" questions can disguise the purpose of the survey and/ or the sponsorship of a study. For example, if a manufacturer wanted to find out whether its distributors were giving the consumers or end-users of its products a reasonable level of service, the researcher would want to disguise the fact that the distributors' service level was being investigated. If he/she did not, then rumours would abound that there was something wrong with the distributor.

6.5.1 Develop the question wording

Survey questions can be classified into three forms, i.e. closed, open-ended and open response-option questions. So far only the first of these, i.e. closed questions has been discussed. This type of questioning has a number of important advantages;

Check Your Progress

The textbook says that one does not start by writing questions. How should the researcher begin?

- It provides the respondent with an easy method of indicating his answer - he does not have to think about how to articulate his answer.
- It 'prompts' the respondent so that the respondent has to rely less on memory in answering a question.
- Responses can be easily classified, making analysis very straightforward.

- It permits the respondent to specify the answer categories most suitable for their purposes.

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Putting questions into a meaningful order and format

Opening questions : Opening questions should be easy to answer and not in any way threatening to THE respondents. The first question is crucial because it is the respondent's first exposure to the interview and sets the tone for the nature of the task to be performed. If they find the first question difficult to understand, or beyond their knowledge and experience, or embarrassing in some way, they are likely to break off immediately. If, on the other hand, they find the opening question easy and pleasant to answer, they are encouraged to continue.

Question flow : Questions should flow in some kind of psychological order, so that one leads easily and naturally to the next. Questions on one subject, or one particular aspect of a subject, should be grouped together. Respondents may feel it disconcerting to keep shifting from one topic to another, or to be asked to return to some subject they thought they gave their opinions about earlier.

Question variety : Respondents become bored quickly and restless when asked similar questions for half an hour or so. It usually improves response, therefore, to vary the respondent's task from time to time. An open-ended question here and there (even if it is not analysed) may provide much-needed relief from a long series of questions in which respondents have been forced to limit their replies to pre-coded categories. Questions involving showing cards/pictures to respondents can help vary the pace and increase interest.

6.5.2 Closing Questions

It is natural for a respondent to become increasingly indifferent to the questionnaire as it nears the end. Because of impatience or fatigue, he may give careless answers to the later questions. Those questions, therefore, that are of special importance should, if possible, be included in the earlier part of the questionnaire. Potentially sensitive questions should be left to the end, to avoid respondents cutting off the interview before important information is collected.

In developing the questionnaire the researcher should pay particular attention to the presentation and layout of the interview form itself. The interviewer's task needs to be made as straight-forward as possible.

- Questions should be clearly worded and response options clearly identified.
- Prescribed definitions and explanations should be provided. This ensures that the questions are handled consistently by all interviewers and that during the interview process the interviewer can answer/clarify respondents' queries.

Ample writing space should be allowed to record open-ended answers, and to cater for differences in handwriting between interviewers.

6.6 Physical appearance of the questionnaire

The physical appearance of a questionnaire can have a significant effect upon both the quantity and quality of marketing data obtained. The quantity of data is a function of the response rate. Ill-designed questionnaires can give an impression of complexity, medium and too big a time commitment. Data quality can also be affected by

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the physical appearance of the questionnaire with unnecessarily confusing layouts making it more difficult for interviewers, or respondents in the case of self-completion questionnaires, to complete this task accurately. Attention to just a few basic details can have a disproportionately advantageous impact on the data obtained through a questionnaire. In general it is best for a questionnaire to be as short as possible. A long questionnaire leads to a long interview and this is open to the dangers of boredom on the part of the respondent (and poorly considered, hurried answers), interruptions by third parties and greater costs in terms of interviewing time and resources. In a rural situation an interview should not last longer then 30-45 minutes.

6.7 Piloting the questionnaires

Even after the researcher has proceeded along the lines suggested, the draft questionnaire is a product evolved by one or two minds only. Until it has actually been used in interviews and with respondents, it is impossible to say whether it is going to achieve the desired results. For this reason it is necessary to pre-test the questionnaire before it is used in a full-scale survey, to identify any mistakes that need correcting.

The purpose of pretesting the questionnaire is to determine:

- Whether the questions as they are worded will achieve the desired results
- Whether the questions have been placed in the best order
- Whether the questions are understood by all classes of respondent
- Whether additional or specifying questions are needed or whether some questions should be eliminated

- Whether the instructions to interviewers are adequate.

Usually a small number of respondents are selected for the pre-test. The respondents selected for the pilot survey should be broadly representative of the type of respondent to be interviewed in the main survey.

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If the questionnaire has been subjected to a thorough pilot test, the final form of the questions and questionnaire will have evolved into its final form. All that remains to be done is the mechanical process of laying out and setting up the questionnaire in its final form. This will involve grouping and sequencing questions into an appropriate order, numbering questions, and inserting interviewer instructions.

6.8 Summary

A well designed questionnaire is essential to a successful survey. However, the researcher must develop his/her own intuition with respect to what constitutes 'good design' since there is no theory of questionnaires to guide him/her.

A good questionnaire is one which help directly achieve the research objectives, provides complete and accurate information; is easy for both interviewers and respondents to complete, is so designed as to make sound analysis and interpretation possible and is brief.

There are at least nine distinct steps: decide on the information required; define the target respondents, select the method(s) of reaching the respondents; determine question content; word the questions; sequence the questions; check questionnaire length; pre-test the questionnaire and develop the final.

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6.9 Key Terms

• **Questionnaire :** It is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents.

Mailed questionnaire

Open-ended and open response-option questions

Personal interviews

6.10 Review Questions

1. Summarize the qualities of a good questionnaire.
2. Where should interviewer instructions pertaining to responses to a particular question be placed on the questionnaire?
3. The textbook says that one does not start by writing questions. How should the researcher begin?
4. What are the two occasions when apparently "redundant" questions should be found in a questionnaire?
5. Name the three advantages of open-ended questions.
6. What are the three reasons why a respondent is unable to answer a question?
7. What is the recommended duration of interviews carried out in rural situations?
8. What are the key characteristics of opening questions in a questionnaire?

Check your progress:

1. Generally as a thumb rule, it is advisable to keep the number of words in a question not exceeding ……..

2. In a .....scale, the number of favourable responses are equal to the number of unfavorable responses.
3. A major disadvantage of dichotomous question is that it ..... the respondent's response..
4. Open-ended questions are useful in ……research, where all possible alternatives are explored.

Answers:

1. 20 2. Balanced 3. Limits 4. exploratory

6.11 Further Reading

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UNIT 7: QUANTITATIVE DATA ANALYSIS

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7.0 Unit Objectives

After reading this unit you should be able:

- To describe about the marketing research.
- To describe various statistical data analytical techniques used in marketing research.
- To differentiate between qualitative and quantitative data analysis.
- To describe the importance of marketing research in an organization.

7.1 Introduction

Marketing research is all about gathering information. Although it is applied to a broad array of situations, marketing research gives decision-makers the information they need to find solutions to business problems, such as the following

- ✓ What is satisfaction level of customers about your product and service offering?
- ✓ What would be probable reaction of your customers to a decision of change in price or a product?
- ✓ What is the feedback of your customers?
- ✓ What would be the appropriate strategy to sustain in the competition of given market?

The solutions to several issues of the business can be found by using marketing research. Despite the fact that the fundamentals of research have survived for thousands of years, technological progress during the last century have bought into a wider array of studies feasible. Enhanced use of Internet in the last 10-15 years has made research accessible at a greatly lesser price and, as a result, it is easily accessible to organizations of all sizes. Therefore, the research area has burst up with new prospectus and methodologies, and organizations have large statistical data at their disposal than ever before.

7.2 The Process of Quantitative Data Analysis

After completion of the survey research, the first job to be carried out in a marketing researcher is to appraise the questionnaire forms. On completion of this appraisal the researcher is prepared to add any open-ended questions if required. The last step in the pre-analysis method is to feed the data onto a computer software program.

7.2.1 Review

Analysts might have taken great care in choosing the research question. Additionally, the questionnaire form might have been meticulously written and tested. However, unless the survey sample was extra emeelyun derided with only a few participators, the actually conducting of the survey will have been out of the control of researchers. For an administered survey form, subordinates might have been employed to carry out the survey. Self-administered forms will have to be accomplished void of any help from researchers or subordinates. Due to these facts, the survey should be checked for validity, comprehensiveness and precision prior to enter the data. The problems that occur when validity is considered are the survey so carried is checked if actually accomplished by an assistant and whether a participator was eligible for the survey. It is inopportune but factual

Check Your Progress

Explain the process of Quantitative Data analysis in short?

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that occasionally those individuals hired to perform surveys may actually have completed the forms on their own. Probable reason for this may be due to disappointment, because of lack of ability to acquire the cooperation of potent participator, or it may perhaps be due to untruthfulness. Whatever be the case, all forms should be checked to see if it looks as if an assistant has completed them. Evidences would reveal answers that are exceptionally random or answers that are persistently replicated. Besides, the demographic segment of a form must be checked to make sure that any eligibility requirements, such as education level and age, have been valued. Completeness of the survey forms should be checked whether all the questions asked in that form are answered or not. There is a possibility of an in complete form due to participants' choice of not to answering some of the questions or may not have been accomplished because of time restriction. Apart from this, the form would consist of more than one page which may produce a possibility that a participant would not have noticed further questions on the next page. Researchers have to decide what proportion of completion is essential for a form to be incorporated in the study or not needed. Finally, forms should be checked for precision. Researchers must appraise the forms to decide if the answers can be read and understood. They should be capable to simply differentiate which answers have been marked. In addition, the answers to open-ended questions should be able to be decoded.

7.2.2 Coding Survey Data

Later on the forms are checked for validity, completeness and accuracy; now they are ready for data entry. Because surveys are a type of quantitative research, the data required is entered as numbers that can then be statistically analyzed. Close-ended questions should be pre-coded on the survey form with the numbers that will be fed into the computer program. On the other hand, open-ended questions require manual processing before they are ready to be entered onto the computer program.

To complete this assignment, researchers should commence by listing all the answers that were recorded for an open-ended question, and then merge the responses. For instance, if a question asked for reason for shopping at city centre Mall, the answers may be combined into the groupings of 'convenient location', 'diversity of stores', 'parking' and 'special events'. Each grouping is then allotted an arithmetical code and it is this code that is fed into the computer program.

7.2.3 Data entry

In case of web-based survey, the data entry step is not necessary as the answers are entered automatically. Some survey forms are now designed so that the outcomes can be automatically scanned. Data entry for conventional paper survey forms can be performed by anybody with the ability to use a computer. A software package such as SPSS, 'R' program can be used for statistical analysis. SPSS is commonly used for business entities and the social science researches. This program is user friendly with built in tutoring features.

7.3 Data Analysis using Descriptive Statistics

After entering the data into the computer software program, marketing researchers begin the process of analyzing the data. The researchers should in no way disregard that the purpose of the analysis is to offer information that can be used for taking strategic decisions. There are two kinds of statistical analysis that can be used and these are descriptive and inferential. Descriptive analysis gathers, summarizes and presents a set of data. This type of analysis is easy for researchers to perform and for management to comprehend.

7.3.1 Descriptive statistics

Descriptive statistics help researchers to observe prototypes

in research data. A fundamental idea used to examine end user characteristics and conduct is frequency, together with one-way frequency and cross tabulation. Using frequency researchers can recognize how many participants' answers were analogous. A second concept is central tendency, which comprises the mode, median and mean. Additionally, dispersion of central tendency should be examined together with range, variance and standard deviation.

Data analysis

- ✓ Frequency: one way, cross tabulation
- ✓ Central Tendency: mode, median, mean
- ✓ Dispersion: range, variance, standard deviation

7.3.2 Frequency

Frequency can be understood by means of the simple example of a survey question that is asked why consumers shop at Atul's Toy store. The survey question may provide the required answers to choose from – fair prices, the top selection and better service. If 100 persons were examined, Atul would wish to know what proportion of the customers preferred each response. However, some persons will not react to a survey in any way. In reality the response rate will vary based on cultural values (Lyness and Kropf, 2007).

The foremost problem faced by the researchers in helping Atul is that among the 100 survey forms not all of them would be useable as a few of the participants might not have given their response, whilst others may have attempted the question but the response provided by them may beard to interpret. Additionally, a number of respondents may not attempt the entire questionnaire. As a consequence, of the 100 survey forms completed conceivably only 95 will be useable. After analyzing the data for one-way distribution (how many persons responded to each potential answer to the question) it may be

concluded that helpful service is the most repeated response. A distribution table of the data would look like Table 1below.

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This information will promptly notify Atul of the positioning of the responses, with helpful service being at the top, followed by best selection and then good prices. Although, it is hard when just interpreting the numbers to comprehend how much more significant to the participants was service over selection. Addition of percentage to the table makes the association between the responses simpler to grasp as the majority of the people can observe the associations among percentages more quickly than those between raw numbers. The percentage is calculated off of the total number of responses used (95) rather than the total number of respondents (100). The percentages show that helpful service is almost twice as important as best selection.

The survey question asking consumers for their impulse for shopping at Atul's store could have been designed to permit for numerous responses. The question would have read 'Which among the following reasons make you shop here?' In such a scenario the numbers would look dissimilar as some people might mark more than one response. The responses look like Table 2 since the question permitted respondents to tick more than one answer; the total response is now 105. Still, the percentage is calculated on 95 respondents only which is why when added together, the responses total more than 100 per cent.

These dissimilar frequency results exhibit the significance of cautiously scheduling the survey questions and answers. In the tables above, the ranking did not change. However it is likely that permitting multiple responses will alter the frequency ranking. If more than one response is permitted, researchers may desire to ask respondents to grade them in preference. In these way respondents who mark both service and price can express which of the two is most significant.

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Cross tabulation

The primary step in calculating frequency is to decide which responses were selected most frequently. The one-way frequency analysis does not illustrate how data collected in the survey are interrelated with each other. For instance, Atul would like to distinguish the ages of the shoppers preferring each response. Cross-tabulation is an easy and yet influential instrument that can be used by researchers to comprehend how variables are interrelated with each other. The term 'cross-tabulation' reveals from the fact that one variable is crossed with another to see the relationship between the two.

In the example of Atul's Toy store, the researcher knows that the reasons people shop at the store are service, selection and price.

Table 1 - Frequency Table with percentages

Opinions	Frequency	Percentage
Better services	52	55%
Top Selection	28	30%
Fair Prices	15	15%
Total	95	100%

Table 2 - Frequency table for questions allowing multiple responses

Opinions	Frequency	Percentage
Better services	58	62%
Top Selection	31	36%
Fair Prices	16	17%
Total	105	105%

The researcher will have as well asked diverse demographic questions, including the age of each shopper. If Atul wishes to target young consumers ranging 18–29 age to shop at his store, he will be most concerned in the opinions of young people. By making use of cross-tabulation he can conclude what is the major stimulating variable for this age group. With a little sample, tabulation can be done with easy math and the table could be built manually. Often a software program such as SPSS will be used.

The benefit of using such type of software is that the data can be expressed in cross-tabulation form for using multiple variables concurrently. The cross-tabulation in Table 3illustrates that, for all shoppers, service is more significant than other variables at 46 per cent. Conversely, the young peoples' group aged 18–29 considers cost as being most essential at 52 per cent, while for consumers with age 30–49 service is considered as most vital. In case of shoppers with age group 50 plus, selection was most significant at 41 per cent.

7.3.3 Central Tendency

We frequently use the expression "average" when they are suggest to a focal rank. Be that as it may there are various approaches to quantify normal or focal propensity that incorporate mode, middle, also, mean.

Table 3 - Cross Tabulation Table

Age:	***18–29***	***30–49***	***50+***	***Total***	
Service	122 34	187 65	104 34	445	46%
Selection	51 14	50 17	24 41	205	21%
Price	185 52	51 18	76 25	312	32%
Totals	358	288	204	962	
	38%	25%	32%		

7.3.4 Mode

Mode alludes to the reaction that is the most well-known for all members. Mode is utilized when portraying ostensible information, which can have one of either two conditions of being, however not both. In the investigation about for Atul's store examined over, the respondents may have additionally been asked their gender. The question may have found that of the 95 study members who reacted to the question on sexual orientation, 55 were male and 40 female. Clearly gender orientation can't be arrived at the midpoint of, as the answer would dependably be precisely half or 50. Rather the idea of mode (generally visit reaction) is utilized, with the mode being male rather than female.

7.3.5 Median

Median is the reaction that measures the midpoint of the reactions. Middle is utilized as a part of ordinal information, where there is a level of distinction. In the question on inspiration for shopping at Atul's, best determination is the middle reaction as one answer got more reactions and one answer got less reactions. Middle can't be utilized while dissecting ostensible information as there are just two conceivable reactions so there can't be a midpoint.

7.3.6 Mean

Mean is the normal of the greater part of the reactions. The mean is computed by including every one of the reactions and afterward partitioning by the quantity of members. On the off chance that the study members were asked their age, it would be easy to decide mean age. The times of the considerable number of members would be included and after that separated by the quantity of reactions, or 95.

Central tendency measures

- ✓ Mode: the most repeated response

- ✓ Median: the response that split a series of responses in half
- ✓ Mean: the average of the responses

7.3.7 Dispersion measures

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One of the problems that researchers should examine is how diverse the responses are from the calculated mean. To do so researchers use the model of range, variance and standard deviation. These statistical ideas let researchers to contrast the dispersions of two sets of data. Whereas two sets of data could at first appear a like since they contain the similar mean, researchers recognize that the individual responses that consist of the mean may be dispersed very differently.

The methods to examine this matter of dispersion of responses comprise of range, variance and standard deviation. The quantity of dispersion may depend on the way the rating or ranking question was structured (Coelho and Esteves, 2007).

7.3.8 Range

Range is the simpler dispersion measure to recognize and tells the researchers how extensively answers are dispersed. To calculate range, the minimum value expressed in the survey is deducted from the maximum value. This furnishes the range of responses. The data below in Table give the sum of money spent on lunch by male and female undergraduates. Both have the same mean of 11 whether the currency is in dollars or pounds or Euros, and yet just by looking at the figures there is obviously difference between the spending patterns of male and female undergraduates. To calculate range, the minimum figure is subtracted from the maximum figure. The range for the females is 6, while the range for them ales is 16.

Check Your Progress

What kind of problems can result from researchers skipping the pre-analysis stage?

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Table 4 - Calculations for range

	Females	Males
	7	3
	9	5
	9	8
	10	9
	11	10
	12	11
	12	13
	13	14
	16	15
	13	22
	11	11
Mean	9	19

7.3.9 Variance

Variance is an extent of the spread between figures in a data set. The variance measures how far each integer in the set is from the mean. Variance is calculated by taking the variation between each integer in the set and the mean, squaring the differences (to make them positive) and dividing the summation of the squares by the number of values in the set. Variance is denoted by symbol ä.

$$\sigma^2 = \frac{\sum(X-\mu)^2}{N}$$

X: individual data points

μ: mean of data points

N: total number of data point

7.3.10 Standard deviation

The greater the variance, the more will be the dispersion of the

responses in the set of data. As can be observed by looking at the data, the males' spending pattern is more dispersed. The problem with the variance number is that being squared; the number no longer has any meaning. If the square root of the variance is calculated the answer will be the standard deviation, which is in the same units, currency, as the original numbers. If the standard deviation is summed and then deducted from the variance, this tells researchers that this range is where the majorityof responses will fall. The standard deviation for the females is 3.72and for that of malesare 4.05. If the standard deviation is higher in one data set than the other, then the responses provided by the participants in that sample will have varied more extensively. While it is easy to observe in the small sample of ten numbers, it would not be simple to see in a set of 950numbers.If these standard deviation numbers are then summed and deducted from the mean, they will illustrate where most of the responses lie. For females, this is between the price of 8.51 and 13.49.

For males, it is 5.58 and 16.42. Two sets of data can have the same mean but still have very differentstandard deviations.

Table 5 - Calculating Variance

	Females		***Males***	
	7	16	3	64
	9	4	5	36
	9	4	8	9
	10	1	9	4
	11	0	10	1
	11	0	11	0
	12	1	13	4
	12	1	14	9
	13	4	15	16
	16	2.5	22	21
	11.0	56	11.0	264
Variance		6.22		29.33
Standard Deviation		2.49		5.42

Most females and males spend between the mean plus or minus the standard deviation.

Females : 8.51 – 13.49, Males: 5.58 – 16.42.

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7.4 Data Analysis using Inferential Statistics

The additional kind of statistical analysis that researchers can perform make use of inferential statistics. These statistical methods go beyond just recitation the data conquered during the research. Of course, no marketing research study that utilizes a sample can 'prove' anything with complete assurance. What the analysis of quantitative research data can do however is indicate whether a hypothesizes most likely to be false. Using inferential statistics, researchers can carry out statistical testator conclude if responses from a sample can be used to depict conclusions about an entire population? In fact more than one statistical test can be conducted on the same set of data (Parket al., 2007).

7.4.1 Statistical testing process

The primary step in using statistical analysis to point out the fact of a hypothesis is to affirm the hypothesis, or deduce, about some characteristics of customers or their behavior. The research methodology will then be planned to make sure that these characteristics, whether about public or their behavior, are calculated. Once the research study has been accomplished and the data fed onto a computer program, the calculated variable for the sample of participants will be compared with the expected results stated in the hypothesis.

The kind of test that will be used to decide if the variation is significant depends on both the type of dimension that was used and the type of resultant data. These tests may be used on their own or in

combination (van Wezel and Potharst, 2007). The z-test is used to decide if the variation in size or mean of characteristics are statistically significant or not, while the t-test also seem for statistical significance but between the means of two unrelated groups. The *z*-test is used in marketing when one segment of consumers is being studied.

7.4.2 Hypothesis

A hypothesis is a guess or assumption that is made by the business or persons commissioning the research. For instance, an electronic gadget manufacturer has come up with a new mobile phone which can take multiple pictures at a single click. The question is whether they should spend the money to develop and launch the product? Qualitative research has pointed out that a lot of users would be fascinated in this product. However, the finance department of the business has declared that at least 30 per cent of users will need to buy the product to make it money-wise feasible. This first hypothesis is the null hypothesis and will be declared as what the business does not desire to be true. (The symbol H_0 is used to designate the null hypothesis.) The null hypothesis is considered true until established false. For the manufacturer in this example the null hypothesis is that less than 30 per cent of users will be pay attention in buying the product. The alternative hypothesis would be that 30 per cent or more of users will be interested in buying the product. (The alternative hypothesis is designated H_1.) One hypothesis is the contrary of the other and so both cannot be true.

Formulae for stating the hypotheses

H0: _ = < 0.30

H1: _ = > 0.30

The statistical tests cannot be used to confirm the hypothesis

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true. This is impracticable as the only way to identify with 100 per cent accurateness if a hypothesis is true is to review the whole population. If the null hypothesis is proven false, then the alternative hypothesis (that 30 per cent or more of students will be interested) can be accepted as being true. The null hypothesis needs tube articulated in such as way that its rejection directs to the acceptance of the preferred conclusion developing the new product. These affirmed hypotheses are an example of a one-tailed test, the type commonly used in marketing research.

The manufacturing company surveyed a sample of 1,100 users (greater than the sample size of 1,024 that would have been needed to make the study viable at 95 per cent assurance) and originated that 32 per cent declared they were interested. While this is over the required 30 percent, researchers know that taking a sample will never be as accurate as asking everyone. However, the question remains – if 32 per cent is so close then is it merely an error that made it over 30 per cent? As a result, the subsequent step is to compute whether the distinction between the hypothesized result and the survey result is statistically significant. The word 'significant' usually is meant to be important, but in statistics it means 'true'. The test to find if it is significant would be automatically calculated by a statistical computer software program such as SPSS. However, the formula is actually easy to comprehend. To calculate the significance all we need is three figures: the hypothesized percentage, the sample percentage, and the standard error of the percentage. Researchers readily have two of these, the hypothesized and sample percentages. They are required to calculate the standard error of the percentages.

The z-score (sometimes referred to as the p-value) can be compared with the numbers found on a table of z-scores to decide if it specify that the null hypothesis is not true. It is standard process to have the computer software do the assessment. However, a rough

computation can be furnished by recalling the standard numbers for confidence levels. For a95 per cent confidence level the number was 1.96 and for 97 per cent confidence 2.58.The z-score of 2.0 tells the researchers that they cannot say with 95 per cent confidence that the null hypothesis is not proved false. Therefore the business will not go ahead with production. Fascinatingly, if the business wanted to be 97 per cent confident – the company would not start production. The same type of calculations can be done for comparing hypothesized mean and the mean that was found by surveying the sample.

Steps in the analysis process

- ✓ Formulation of the hypothesis
- ✓ Carry out the research
- ✓ Compare the calculated value with the hypothesized value
- ✓ Choose the necessary level of confidence
- ✓ Decide a statistical test for significance
- ✓ Compute the test value
- ✓ State a conclusion and any recommendations

7.4.3 Level of confidence

The chance that the null hypothesis will be rejected as false when it is definitely true is called Type I Error, which is denoted by using the lower case Greek alpha (á). The extent of possibility that a Type I error has been committed is called the level of significance of the statistical test. Researchers have to choose on the amount of risk they are ready to accept of committing type I error. There are standard levels of risk that are considered tolerable when conducting statistical analysis. These standard levels, or value of á, are 0.01, 0.05 or 0.010. Another way to articulate these values is that there is a 1 per cent, 5 per cent or 10 per cent chance of the hypothesis being rejected when it is definitely true. The traditional value used by researchers is 0.05, or there is a5 per cent risk that the null hypothesis is false, but it isn't rejected.

Another type of error, Type II, happens when the null hypothesis is not rejected when it is supposed to be rejected. The Greek letter beta (â) is used for this type of error. A statistical test to verify for Type I errors is known as one-tailed test, while a statistical test to check for Type II errors is known as two-tailed test. Most of the researchers only use a Type I error that is one-tailed test.

7.4.4 Chi-square tests

Chi-square is a statistical test usually used to compare observed data with data we would expect to attain as per specific hypothesis. For instance, if, according to Gregor Mendel's law of inheritance, you expected 100 of 200seedlings from a cross to be male and the real observed number was 80 males, then you might want to know about the "goodness to fit" between the observed and expected. Were the deviations (differences between observed and expected) the result of chance, or were they due to other factors. How much deviation can take place before you, the investigator, must conclude that something other than chance is at work, causing the observed to differ from the expected. The chi-square test is always testing what scientists call the **null hypothesis,** which states that there is no significant difference between the expected and observed result.

The formula for calculating chi-square (X^2) is:

$$X^2= \quad (o-e)^2/e$$

Where,

e = stands for expected frequency

o = stands for observed frequency and

X = stands for chi square.

7.5 Analysis of Qualitative Data Content

Once the data have been structured, recorded and coded, the second step in the process of analysis is to decide if there are any associations between the conceptions and categories. The reason of developing associations is to produce novel ideas to answer a research question. These novel ideas will be the foundation for making suggestions for action. For instance, one qualitative research study was used to scrutinize the cultural effects of the country of origin of a product on British consumption manners. Consequently, it was observed that country of source was significant for a few groups of products (Balestrini et al., 2003).After all, administration will desire actionable suggestions from a study, not just analysis. Testimonies that basically portray researchers' impressions will not be considered valuable enough to validate the cost of the research. Probable suggestions may involve how to target fresh form of customer segments, descriptions of the process of consumer behaviors, a comparison and difference of customer stimulus, or a hypothesis of a relation among variables that will require to be verified by future quantitative research. Beneath is one example of ethnographic research that was used to provide such recommendations.

7.5.1 Consumer segments

New market segments can be targeted by making use of Coded qualitative research data. A business might be conscious of how to promote their produce to their present demographic and geographic segments, but qualitative data may disclose completely new psychographic segments of which that business was ignorant. These fresh segments should have been recognized based on general principles and approach that have been verbalized or exhibited through the qualitative research process. For illustration, a research group on a

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produce for elder consumers may have found that people aged 65–75 years old do not believe themselves as being elder. Since they are still living a active life, this categorization based on age may have no sense for them. In spite, they might recognize themselves as 'active adults' who just happen to be retired or on their next job. They might as well believe that they have no approach in ordinary with people in the conventional group called 'senior citizens'. Similarly, qualitative research data may discover groups of individuals who recognize themselves based on their various types of hobbies. What they would all have in familiar is a precise interest, say in crafts, and will therefore classify themselves by this, for example as 'crafters'. As a outcome, researchers might advise that a business commissioning research on this topic considers producing products intended to this new segment. Qualitative research might also reveal new usage categories. In discussions of food utilization, it may be found that food usually consumed at breakfast is as well enjoyed at other times of the day. Based on a discovery that cereal is also eaten at the office, researchers may suggest a new promotional campaign based on this usage.

7.5.2 Consumer behavior processes

A part from new market segments, qualitative research can offer insights into customer behavior practices. A business that formulates readymade dinner entrées may be interested in the food preparation processes of today's hectic dual career families. Investigations of ethnographic data may disclose that parents would like to have everyone at dining table for meals together, but that kids would have their personal food preferences. Using this information, researchers might suggest that a business produces prepackaged dinners with a option of side dishes so that everybody can have food jointly and yet still have the foodstuff they each desire. If it is found that

parents still wish to have their families uphold a modest custom when dining, researchers may then suggest that the wrapping includes decorative paper napkins. An observational study on how people ride their cars may find that drivers need mug holders which can carry their beverages hot or cold when they spend lengthy times in the car. Additionally, observing kids traveling in their cars may have discovered a requirement of a small storage space for their foodstuff. These are thoughts that may not or else have been revealed in quantitative survey research. However, analyzing the data from qualitative research can disclose helpful thoughts such as these that can be suggested to businesses.

7.5.3 Comparing and contrasting consumer qualities

While carrying out the research the researchers may note some variations in the customer behavior process depending upon their demographic or psychographic qualities. For instance, a qualitative research study may have been specially intended to observe and evaluate the variations in cell phone usage for different age groups. These types of variations will appear in qualitative data from focus groups, interviews or ethnographic studies. In this case researcher's may possibly discover that women were using the picture featured mobile phone to take pictures while purchasing of possible purchases for their home that they can then observe later. Where as, it was found that males were using their mobile phone cameras to take candid pictures of their friends. These are thoughts that can be converted into recommendations.

7.5.4 Development of hypotheses

Additional recommendations that might outcome from an analysis of qualitative data are hypotheses about the association among

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two variables. These hypotheses cannot be supposed to be proven, based on the qualitative research. Yet, it may be so stimulating that the researchers recommend quantitative research is carried out to decide the soundness of these hypotheses. For instance, qualitative research may discover that the consumers who are nonusers of a produce trust that the produce is too costly to manage. This fact might then be tested further with survey research.

7.6 Analysis of ethnographic and observational research data

The information offered by ethnographic and observational research will not be in a unwritten format. Alternatively, the data will be in the type of notes on behavior, photos or video. Observation forms and comments should also be analyzed, but not by coding for words. Instead researchers will be looking for sole or recurring behavior that has been noted on the forms or in the photos or videos. Researchers can come across these data pertaining to the process of using a produce, novel habits of using a produce, where consumers use a produce and the mistakes they make when using produce – all of which may have been noted on the forms (Gummesson, 2007).

For instance, observational research of consumers shopping at a garment stores can show how they move through the store, which products they tend to purchase at the earliest, and how much time they spending the store. If researchers observe that people appear to have a difficulty in finding the fitting rooms, improved signs may be recommended. In addition, if it becomes noticeable that certain clothing racks are not being visited, it may be recommended that the store layout to be changed. All of this records can then be used by management to make the store extra user friendly. Often ethnographic

research may disclose that people use a product in a way that was not originally proposed by the company that designed that product. These insights can be used to make suggestions on the redesigning of a product or the development of a entirely new product. For instance, an ethnographic study may have been carried out on students living together in university-owned accommodation. An analysis of videos taken during the study may have found that students prefer to study while lying on their beds. This study, would recommend that better lighting to be provided above beds. After all, good research should result in increased profits.

7.7 Summary

The distinction between analyzing qualitative and quantitative data include the fact that the analysis of quantitative data results in statistics that portray human behavior. However, qualitative data are analyzed for insights into the impetus for human behavior. Quantitative data are analyzed at the end of research while qualitative data are analyzed while research is being conducted. The analysis of qualitative data is an art that depends up on the comprehension and ability of researchers. The analysis must only be carried out by researchers as they on their own will have experienced the incidents that took place during the research. In order to these incidents are not lost, researchers should hold debriefing meetings as soon as the research study has been accomplished and even during the research progression. While qualitative analysis is an art, there is still a procedure to be followed. Initially the data must be organized and any vocal information should be written down. The data are then reviewed and coded for concepts and categories. Lastly, the correlation between concepts and categories is questioned and the findings are deduced into recommendations for action. Data are arranged based on the methodology and comments are then transcribed. This transcription can be accurate or in note form. The transcription should be in a format that allows researchers to effortlessly

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add insights and coding. The transcription is then reviewed for insights. The most significant step in the qualitative analysis process is the coding of the data.

Both repeated and isolated incidents and comments are coded by theme and named as concepts. This can be done physically by marking the words and then distinguishing the type of note by words or colors. From these coding will be built categories with common elements. Nowadays software's are being used to make this task more convenient, but the ideas for the coding of concepts and categories must first come from researchers. Analysis of coded data will comprise of questioning the relationship among categories, and looking for insights that can be interpreted to answer the research question. The interpretation might reveal information on new potential consumer segments. It also may reveal information on consumers' behavior procedures. Consumers could thus be analyzed for an interpretation of traits. In addition, hypotheses between variables may be established. Finally, analysis of nonverbal ethnographic and observational data can be used.

7.8 Key Terms

Frequency : is a tabular representation of a survey data set used to organize and summarize the data.

Mode : is the value that appears most often in a set of data.

Median : is the value dividing the higher half of a data sample, from the lower half.

Mean : is the sum of a total numbers divided by the total numbers in the collection.

Hypothesis : is a proposed explanation for a phenomenon.

Variance : is a measurement of the spread between numbers in a data set.

7.9 Review Questions

1. Explain the process of Quantitative Data analysis in short?
2. What is a meant by coding of data and how it is carried out?
3. Enlist various computer software programs used for data analysis?
4. What type of errors can be found when survey forms are reviewed before data entry?
5. What kind of problems can result from researchers skipping the pre-analysis stage?
6. What is frequency in statistical means?
7. What do you understand about mode, mean, median?
8. Explain central tendency?
9. Explain hypothesis and its types?
10. Describe Chi Square Test?
11. What does level of confidence let us know explain in short?
12. Explain in detail about qualitative data analysis?
13. What is ethnographic and observational research; explain the process of analysis used in such research types?

Check your progress:

1. ..... of the data is a necessary function of any statistical analysis.
2. Different sets of data can be compared by comparing their .....
3. ..... is defined as the sum of observations divided by the number of observations.
4. ..... is used when the magnitude of individual observations is large.
5. Median and mode are also known as the ..... averages.
6. In a grouped frequency distribution, there are classes along with their respective .....

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7. ..... check of accuracy is used when the arithmetic mean of a frequency distribution is calculated by shortcut or step-deviation method.
8. Median of distribution is that value of the variate which divides it into ..... parts.
9. The total area under a histogram is equal to total .....
10. ..... divide a distribution into 10 equal parts.
11. A distribution may have only ..... quartiles.
12. Mode is that value of the variate which occurs ..... number of times in a distribution.
13. It is ..... around which other items are most densely distributed.
14. ..... is the spread of the data in a distribution.
15. ..... is a measure of the average squared distance between the mean and each term in the population.

Answers:

1. Summarisation 2. Averages 3. Arithmetic Mean 4. Shortcut Method 5. Positional 6. Frequencies 7. Charlier's 8. Two equal 9. Frequency 10. Deciles 11. 3 12. Maximum 13. Mode 14. Dispersion 15. Variance

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UNIT 8: REPORT WRITING

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8.0 Unit Objectives

After studying this unit, you will be able to:

- Explain the meaning and characteristics of research report
- Recognize the significance of report writing
- Describe the techniques and precaution of interpretation
- Discuss the layout of report
- Categorize different types of report

8.1 Introduction

A report is a very formal document that is written for a variety of purposes, generally in the sciences, social sciences, engineering and business disciplines. Generally, findings pertaining to a given or specific task are written up into a report. It should be noted that reports are considered to be legal documents in the workplace and, thus, they need to be precise, accurate and difficult to misinterpret.

There are three features that, together, characterize report writing at a very basic level: a predefined structure, independent sections, and reaching unbiased conclusions.

Check Your Progress

What is a research report?

- **Predefined structure**: Broadly, these headings may indicate sections within a report, suchas an introduction, discussion, and conclusion.
- **Independent sections**: Each section in a report is typically written as a stand-alone piece, sothe reader can selectively identify the report sections they are interested in, rather thanreading the whole report through in one go from start to finish.
- **Unbiased conclusions**: A third element of report writing is that it is an unbiased and objective form of writing.

8.2 Characteristics of Research Report

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Characteristics feature is an integral part of the report. There is no hard and fast rule for preparing a research report. The research report will differ based on the need of the particular managers using the report. The report also depends on the philosophy of the researcher.

Example: A report prepared for a government agency will be different from the one preparedfor a private organization. In spite of the fact that, marketing report is influenced by the researcher, there are certain characteristics which the report should possess, if it is to be effectively communicated. These characteristics can be classified as:

A. Substantive characteristics

B. Semantic characteristics.

8.2.1 Substantive Characteristics

Substantive characteristics are:

- Accuracy
- Currency
- Sufficiency
- Availability
- Relevancy

The more that the report possesses the above characteristics, the greater is its practical value in decision making.

Accuracy: Accuracy refers to the degree to which information reflects reality. Specifically, research report must accurately present both research procedure and research results. Even if the researchresults are not as per the expectation of the management, the researcher has the professional

Currency: Currency refers to the time span between completion of the research project and presentation of the research report

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to management. If the management receives the research report too late, the results are no longer valid due to environmental changes, and then the report will have no or little value for decision making. Currency is one of the reasons for orally orinformally communicating preliminary research results to management to ensure timely decisionmaking.

Sufficiency: The research report must have sufficient details, so that important and valid decision can be made. Sometimes the sample size, sample representativeness may act as a constraint for sufficient details not being available.

Example: Data required by the management, say segment wise market, whereas overall market data is available.

Availability: The fourth important characteristic of research report is that, it is available to the appropriate decision maker when they need it. Availability refers to the communication process between researcher and the decision maker. We use the word 'appropriate decision maker' to emphasize the fact "who should or who should not have access to the report". This decision is made by the management, and it is the duty of the researcher to carry out this decision. Most reports carry confidential information. Therefore, it is necessary to restrict the report availability, to individuals as well as outside of an organization to prevent the competitor from having access to it.

Relevancy: The research report should be confined to the decision issue researched. Sometimes the researcher might include some information, which he thinks is interesting, but may not have any relevance. This type of information should be excluded from the report. Example: A researcher may be preparing a report on the audience perception of RJs (Radio Jockeys). This may be done with a view to recruit them based on the perception. In this context, a lengthy commentary on relative audience appeal of each radio station is included. This type of data may be readily available from

some research agency, who is selling commercial data. Therefore, including this type of aspect may not be necessary.

8.2.2 Semantic Characteristics

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Semantic characteristics are equally important in report. The report should be grammatically correct. It should be free from spelling and typing errors. This will ensure that there is no ambiguity or misunderstanding. Assistance of a proof reader, other than the researcher would be required to eliminate the above errors.

1. Creative expressions in the form of superlatives, similes should be avoided. Notes
2. The report should be concise.
3. Jargon of any kind should be avoided.
4. Common words with multiple meaning should be avoided. v. Language of the report must be simple. For example, sentences like "illumination must be
5. extinguished when premises are not in use" can be expressed in simple words say "switch
6. off the lights when you leave".
7. Avoid using 'I' 'we'. The report should be more impersonal.
8. Sometimes, the current research uses the data of research conducted in the past. In this case it is better to use past tense than present tense.

The following are the hindrances for clarity of any research report.

- Ambiguity
- Jargon
- Misspelled words
- Excessive prediction
- Improper punctuation

- Unfamiliar words
- Clerical error

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Some of the illustrations that can cause inaccuracy in report writing are given below :

- **Addition/subtraction error:** Assume that a survey was conducted to ascertain the incomeof various strata of population in a city. Suppose, it is found that 15% belong to super rich,18% belong to rich class, 61% belong to middle class.By oversight the total is recorded as (15+61+18) which is not equal to hundred. This errorcan be corrected easily by the researcher. This type of error leads to confusion because thereader or decision maker does not know which categories are left out (may be lowermiddle class and lower class).
- **Confusion between percentage and percentage points:** Suppose the report indicates thatraw material cost of a product as a percentage of total cost increased from 8 percentagepoints in 2003 to 10 percentage points in 2009. Therefore, the raw material cost has increasedby only 2 percentage points in 6 years. The real increase is 2 percentage points or25 percent.
- **Wrong conclusion:** Mr. X annual income has increased from 20,000 to 40,000 in 8 years.Therefore, the conclusion is, since income has doubled, the purchasing power also hasdoubled. This may not be true because due to inflation in 8 years, purchasing power mightcome down or money value could get eroded.

8.3 Significance of Report Writing

Preparation and presentation of a research report is the most important part of the research process. No matter how brilliant the

hypothesis and how well designed is the research study, they are of little value unless communicated effectively to others in the form of a research report. Moreover, if the report is confusing or poorly written, the time and effort spent on gathering and analysing data would be wasted. It is therefore, essential to summarise and communicate the result to the management in the form of an understandable and logical research report. Research report is regarded as a major component of the research study for the research task remains unfinished till the report has been presented and/or written. As a matter of fact even the most brilliant hypothesis, very well designed and conducted research study, and the most striking generalizations and findings are of modest value unless they are effectively communicated to others. The rationale of research is not well served unless the findings are made known to others. Research results must customarily enter the general store of knowledge. All this explains the importance of writing research report. There are people who do not consider writing of report as an essential part of the research process. But the general opinion is in favour of treating the presentation of research results or the writing of report as division and parcel of the research project. Writing of report is the final step in a research study and requires a set of skills somewhat different from those called for in respect of the former stages of research. This task should be accomplished by the researcher with extreme care; he may seek the assistance and guidance of experts for the reason.

8.4 Techniques and Precautions of Interpretation

Interpretation means bringing out the meaning of data. We can also say that interpretation is to convert data into information. The essence of any research is to do interpretation about the study. This requires a high degree of skill. There are two methods of drawing conclusions (i) induction (ii) deduction. In the induction method, one starts from

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observed data and then generalisation is done which explains the relationship between objects observed. On the other hand, deductive reasoning starts from some general law and is then applied to a particular instance i.e., deduction comes from the general to a particular situation.

Example of Induction: All products manufactured by Sony are excellent. DVD player model 2602 MX is made by Sony. Therefore, it must be excellent.

Example of Deduction: All products have to reach decline stage one day and become obsolete. This Notes radio is in decline mode. Therefore, it will become obsolete.

During the inductive phase, we reason from observation. During the deductive phase, we reason towards the observation. Successful interpretation depends on how well the data is analysed. If data is not properly analysed, the interpretation may go wrong. If analysis has to be corrected, then data collection must be proper. Similarly, if the data collected is proper but analysed wrongly, then too the interpretation or conclusion will be wrong. Sometimes, even with the proper data and proper analysis, the data can still lead to wrong interpretation. Interpretation depends upon the experience of the researcher and methods used by him for interpretation.

8.4.1 Basic Analysis of "Quantitative" Information

(for information other than commentary, e.g., ratings, rankings, yes's, no's, etc.) ? Make copies of your data and store the master copy away. Use the copy for making edits, cutting and pasting, etc.

- ✓ Tabulate the information, i.e., add up the number of ratings, rankings, yes's, no's for eachquestion.

- ✓ For ratings and rankings, consider computing a mean, or average, for each question. Forexample, "For question #1, the average ranking was 2.4". This is more meaningful thanindicating, e.g., how many respondents ranked 1, 2, or 3.
- ✓ Consider conveying the range of answers, e.g., 20 people ranked "1", 30 ranked "2", and 20people ranked "3".

8.4.2 Basic Analysis of "Qualitative" Information

(respondents' verbal answers in interviews, focus groups, or written commentary on questionnaires):

- ✓ Read through all the data.
- ✓ Organize comments into similar categories, e.g., concerns, suggestions, strengths,
- ✓ weaknesses, similar experiences, program inputs, recommendations, outputs, outcome
- ✓ indicators, etc.
- ✓ Label the categories or themes, e.g., concerns, suggestions, etc.
- ✓ Attempt to identify patterns, or associations and causal relationships in the themes, e.g. all people who attended programs in the evening had similar concerns, most people camefrom the same geographic area, most people were in the same salary range, what processesor events respondents experience during the program, etc.
- ✓ Keep all commentary for several years after completion in case needed for future reference.

8.4.3 Interpreting Information

- ✓ Attempt to put the information in perspective, e.g., compare results to what you expected,promised results; management or

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program staff; any common standards for your productsor services; original goals (especially if you're conducting a program evaluation);indications or measures of accomplishing outcomes or results (especially if you'reconducting an outcomes or performance evaluation); description of the program'sexperiences, strengths, weaknesses, etc. (especially if you're conducting a processevaluation).

- ✓ Consider recommendations to help employees improve the program, product or service;conclusions about program operations or meeting goals, etc.
- ✓ Record conclusions and recommendations in a report, and associate interpretations tojustify your conclusions or recommendations.

8.4.4 Precautions

1. Keep the main objective of research in mind.
2. Analysis of data should start from simpler and more fundamental aspects.
3. It should not be confusing.
4. The sample size should be adequate.
5. Take care before generalising of the sample studied.
6. Give due attention to significant questions.

Caution: In report writing, do not miss the significance of some answers, because they are found from very few respondents, such as "don't know" or "can't say".

Check Your Progress

Why are visual aids used in oral presentation?

8.5 Types of Report Notes

8.5.1 Oral Report

This type of reporting is required, when the researchers are asked to make an oral presentation. Making an oral presentation is

somewhat difficult compared to the written report. This is because the reporter has to interact directly with the audience. Any faltering during an oral presentation can leave a negative impression on the audience. This may also lower the self-confidence of the presenter. In an oral presentation, communication plays a big role. A lot of planning and thinking is required to decide 'What to say', 'How to say', 'How much to say'. Also, the presenter may have to face a barrage of questions from the audience. A lot of preparation is required; the broad classification of an oral presentation is as follows.

Nature of an Oral Presentation

Opening: A brief statement can be made on the nature of discussion that will follow. The opening statement should explain the nature of the project, how it came about and what was attempted.

Finding/Conclusion: Each conclusion may be stated backed up by findings.

Recommendation: Each recommendation must have the support of conclusion. At the end of the presentation, question-answer session should follow from the audience.

Method of presentation: Visuals, if need to be exhibited, can be made use of. The use of tabular form for statistical information would help the audience.

What type of presentation is a root question? Is it read from a manuscript or memorized or delivered ex-tempo. Memorization is not recommended, since there could be a slip during presentation. Secondly, it produces speaker-centric approach. Even reading from the manuscript is not recommended, because it becomes monotonous, dull and lifeless. The best way to deliver in ex-tempo, is to make main points notes, so that the same can be expanded. Logical sequences should be followed.

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8.5.2 Written Report

Following are the Various Types of Written Reports:

(A) ***Reports can be classified based on the time-interval such as:***

1. Daily
2. Weekly
3. Monthly
4. Quarterly
5. Yearly

(B) ***Type of reports:***

1. Short report
2. Long report
3. Formal report
4. Informal report
5. Government report

1. **Short report**: Short reports are produced when the problem is very well defined and if the scope is limited. For example, Monthly sales report. It will run into about five pages. It consists of report about the progress made with respect to a particular product in a clearly specified geographical locations.
2. **Long report:** This could be both a technical report as well as non-technical report. This will present the outcome of the research in detail.
   - ***(a) Technical report***: This will include the sources of data, research procedure, sample design, tools used for gathering data, data analysis methods used, appendix, conclusion and detailed recommendations with respect to specific findings. If any journal, paper or periodical is referred, such references must be given for the benefit of reader.
   - ***(b) Non-technical report:*** This report is meant for those who

are not technically qualified. E.g. Chief of the finance department. He may be interested in financial implications only, such as margins, volumes, etc. He may not be interested in the methodology.

3. **Formal report:** Example: The report prepared by the marketing manager to be submitted to the VicePresident(marketing) on quarterly performance, reports on test marketing.
4. **Informal report:** The report prepared by the supervisor by way of filling the shift log book, to be used by his colleagues.
5. **Government report:** These may be prepared by state governments or the central government on a given issue.

8.6 Preparation of Research Report

Having decided on the type of report, the next step is report preparation. The following is the format of a research report:

1. Title Page
2. Page Contents
3. Executive Summary
4. Body
5. Conclusions and Recommendations
6. Bibliography
7. Appendix

1. Title Page: Title Page should indicate the topic on which the report is prepared. It should include the name of the person or agency who has prepared the report.

2. Table of Contents: The table of contents will help the reader to know "what the report contains". The table of contents should indicate the various parts or sections of the report. It should also indicate the chapter headings along with the page number.

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3. Executive Summary: If your report is long and drawn out, the person to whom you have prepared the report may not have the time to read it in detail. Apart from this, an executive summary will help in highlighting major points. It is a condensed version of the whole report. It should be written in one or two pages. An executive summary should have,

a) Objectives
b) Brief methodology
c) Important findings
d) Key results
e) Conclusion

4. The Body: This section includes:

a) Introduction
b) Methodology
c) Limitations
d) Analysis and interpretations

Introduction: The introduction must explain clearly the decision problem and research objective. The background information should be provided on the product and services provided by the organisation which is under study.

Methodology: How you have collected the data is the key in this section. For example, Was primary data collected or secondary data used? Was a questionnaire used? What was the sample size and sampling plan and method of analysis? Was the design exploratory or conclusive?

Limitations: Every report will have some shortcoming. The limitations may be of time, geographical area, the methodology adopted, correctness of the responses, etc.

5. Conclusion and Recommendation:

a) What was the conclusion drawn from the study?
b) Based on the study, what recommendation do you make?

6. Bibliography: If portions of your report are based on secondary data, use a bibliography section to list the publications or sources that you have consulted. The bibliography should include, title of the book, name of the journal in case of article, volume number, page number, edition, etc.

7. Appendix: The purpose of an appendix is to provide a place for material which is not absolutely essential to the body of the report. The appendix will contain copies of data collection forms called questionnaires, details of the annual report of the company, details of graphs/charts, photographs, CDs, interviewers' instructions. Following are the items to be placed in this section.

a) Data collection forms
b) Project related paper cuttings
c) Pictures and diagrams related to project
d) Any other relevant things.

8.6.1 How to Write a Bibliography?

Bibliography, the last section of the report comes after appendices. Appendices contains questionnaires and other relevant material of the study. The bibliography contains the source of every reference used and any other relevant work that has been consulted. It imparts an authenticity regarding the source of data to the reader. Bibliography are of different types viz., bibliography of works cited; this contains only the items referred in the text. A selected bibliography lists the items which the author thinks are of primary interest to the reader. An annotated bibliography gives brief description of each item. The method of representing bibliography is explained below.

Books :

Name of the author, title of the book (underlined), publisher's detail, year of publishing, page number.

Single Volume Works. Dube, S. C. "***India's Changing Villages***", Routledge and Kegan Paul Ltd.,1958, p. 76.

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8.7 Style, Layout and Precautions of the Report writing

8.7.1 Style of Report Writing

Remember that the reader:

- Has short of time,
- Has many other urgent matters demanding his or her interest and attention,
- Is probably not knowledgeable concerning 'research jargon'.

Therefore, the rules are:

- Simplify. Keep to the essentials.
- Justify. Make no statement that is not based on facts and data.
- Quantify when you have the data to do so. Avoid large, small, instead, say 50%, one inthree.
- Be precise and specific in your phrasing of findings.
- Inform, not impress. Avoid exaggeration.
- Use short sentences.

8.7.2 Layout of the Report

A good physical layout is important, as it will help your report:

a) Make a good initial impression,

b) Encourage the readers, and

c) Give them an idea of how the material has been organised so the reader can make a quick determination of what he will read first.

Particular attention should be paid to make sure there is:

a) An attractive layout for the title page and a clear table of contents.

b) Consistency in margins and spacing.

c) Consistency in headings and subheadings, for example, font size 16 or 18 bold, for headingsof chapters; size 14 bold for headings of major sections; size 12 bold, for headings of subsections,etc.

d) Good quality printing and photocopying. Correct drafts carefully with spell check as wellas critical reading for clarity by other team-members, your facilitator and, if possible, outsiders.

e) Numbering of figures and tables, provision of clear titles for tables, and clear headings for columns and rows, etc.

f) Accuracy and consistency in quotations and references.

8.7.3 Precautions in Report Writing

Endless description without interpretation is another pitfall. Tables need conclusions, not detailed presentation of all numbers or percentages in the cells which readers can see for themselves.

Neglect of qualitative data is also quite common. Still, quotes of informants as illustration of your findings and conclusions make your report lively. They also have scientific value in allowing the reader to draw his/her own conclusions from the data you present. (Assuming you are not biased in your presentation!) Sometimes qualitative data (e.g., open opinion questions) are just coded and counted like quantitative data, without interpretation, whereas they may be providing interesting.

The following must be avoided while preparing a report:

- The inclusion of careless, inaccurate, or conflicting data.
- The inclusion of outdated or irrelevant data.
- Facts and opinions that are not separated.
- Unsupported conclusions and recommendations.

- Careless presentation and proofreading.
- Too much emphasis on appearance and not enough on content.

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8.8 Summary

- A report is a very formal document that is written for a variety of purposes, generally inthe sciences, social sciences, engineering and business disciplines.
- The most important aspect to be kept in mind while developing research report, is the communication with the audience.
- Report should be able to draw the interest of the readers. Therefore, report should be centric. Other aspect to be considered while writing report are accuracy and clarity.
- The presenter must make sure that presentation is completed within the time allotted.
- Written report may be classified based on whether the report is a short report or a long report. It can also be classified based on technical report or non-technical report.
- Written report should contain title page, contents, executive summary. Body, conclusionsand appendix. The last part is bibliography.
- The style of the report should be simple and to the essentials.
- There should not be endless description in report writing and qualitative data is not to beexcluded.

8.9 Key Terms

Appendix: The part of the report whose purpose is to provide a place for material which is not absolutely essential to the body of the report.
Bibliography: The section to list the publications or sources that you have consulted in Notespreparation of report
Executive Summary: It is a condensed version of the whole report.

Informal Report: The report prepared by the supervisor by way of filling the shift log book, to be used by his colleagues

Short Report: Short reports are the reports that are produced when the problem is very well defined and if the scope is limited.

8.10 Review Questions

1. What is a research report?
2. What are the characteristics of report?
3. What is the criterion for an oral report? Explain.
4. What is meant by "consider the audience" when writing a research report.
5. On what criteria, oral report is evaluated? Suggest a suitable format.
6. Why are visual aids used in oral presentation?
7. What are the various criteria used for classification of written report?
8. What are the essential content of the following parts of research report?
    (a) Table of contents
    (b) Title page
    (c) Executive summary
    (d) Introduction
    (e) Conclusion
    (f) Appendix
9. Oral presentation requires the researcher to be good public speaker explain.
10. Explain the style and layout of report.

Check your progress:

1. The research report will differ based on the ……of the particular managers using the report.

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2. Accuracy refers to the degree to which information reflects……..
3. Availability refers to the communication process between researcher and the……..
4. …….refers to the time span between completion of the research project and presentation of the research report to management
5. ……is regarded as a major component of the research study
6. Writing of report is the ……..step in a research study and requires a set of skills somewhat different from those called for in respect of the former stages of research.
7. ……means bringing out the meaning of data.
8. Successful interpretation depends on how well the data is……...
9. In the ……method, one starts from observed data and then generalisation is done
10. In an oral presentation, …….plays a big role.
11. ……report presents the outcome of the research in detail.
12. The …….statement should explain the nature of the project, how it came about and what was attempted.
13. The ……..should indicate the various parts or sections of the report.
14. ……..Page should indicate the topic on which the report is prepared.
15. A selected bibliography lists the items which the author thinks are of ……interest to the reader.
16. In a report there must be …….in margins and spacing.
17. Aim must be logical and ……in the report presentation.

Answers:

1. need 2. Reality 3. decision maker 4. Currency 5. Research report

6. Final 7. Interpretation 8. Analysed 9. induction 10. Communication 11. Long 12. Opening 13. table of contents 14. Title 15. primary 16. Consistency 17. systematic

8.11 Further Readings

Books

1. Abrams, M.A., *Social Surveys and Social Action*, London: Heinemann, 1951.
2. Arthur, Maurice, *Philosophy of Scientific Investigation*, Baltimore: John Hopkins
3. *University Press*, 1943
4. Bernal, J.D., *The Social Function of Science*, London: George Routledge and Sons, 1939.
5. Chase, Stuart, *The Proper Study of Mankind: An inquiry into the Science of Human Relations*, New York, Harper and Row Publishers, 1958.
6. S. N. Murthy and U. Bhojanna, *Business Research Methods*, Excel Books.