

Subject: Research Methodology

Computer Code: 200004

UNIT-1

INTRODUCTION TO RESEARCH METHODOLOGY

MEANING OF RESEARCH:-The term research means searching again and again. To search means to find out or to study. Research means together information by conducting careful investigation or enquires specifically through search for new facts in any branch of knowledge. It is an art of scientific investigation because there is search on particular information on a specific topic.

DIFFERENCES BETWEEN RESEARCH METHOD / RESEARCH METHODOLOGY:-

- The term research methods means all though tools and techniques used for conducting research.
- These methods are used for performing various research operations.
- These methods are also used for data collection by the researcher. Hence, they are the methods of data collection.
- It also includes statistical techniques used for establishing the relationship.
- The term research methodology means a science of studying the research problems and solving the research problems systemically.
- It involves number of steps to be adopted for conducting research and arriving at the solution to solve the research problems.
- It includes the study of research methods or techniques used by the researcher.
- Research methodology includes different calculation such as:-Measures of central

tendency, measures of dispersion, as well as testing the hypothesis by application of certain tests. In simple words, methodology in research mean a systematic procedure of conducting research, gathering information by way of application of logical and systematic methods.

- It includes discovering new facts, verifying old facts and interpretation of data.

SOCIAL SCIENCE RESEARCH:-

- Sciences are broadly divided into social sciences and natural sciences.
- Social sciences include various disciplines dealing with human life, human behaviour, social groups and social institutions.
- They consist of anthropology (study at human origins, societies, cultural) behavior sciences, commerce, demography, economics, education, geography, history, law, linguistics, management, political science, psychology, sociology and work.
- Though these sciences are treated as separate branches at knowledge for the purpose at study, they are interdependent studies at the different aspect at same object. Egg:-MAN.
- Social sciences are not exact science like physical science, as they unlike the latter, deal with human beings.
- Human nature and man's environment are so complex that it is more difficult to complement and predict human behavior then the physical phenomena.
- Know two persons are a like feelings, rights or emotions.
- Social science research is a systematic method at exploring, analyzing and conceptualizing human life in order to extend, correct or verify knowledge of human behavior and social life.
- In other words, social sciences research "Seeks to find explanations to unexplained social

phenomena to clarify the doubtful, and correct the misconceived facts at social life".

Objectives of social science research:-

- The aim of social science research like research in physical science is to discover new facts or verify and test old facts.
- It tries to understand the human behavior and its interaction with the environment and social institution.
- It tries to find out the casual connection between human activities and natural laws governing them.
- Another purpose of social science research is to develop new scientific tools, concepts and theories which would facilitate to reliable and valid study of human behavior and social life.

Functions or uses of social science research

1. Discovery of facts and their interpretation.
2. Diagnosis of problem and their analysis.
3. Systematization of knowledge.
4. Control over social phenomena.
5. Prediction – research aims at finding an order among social facts and their casual relations. This offers a sound basis for prediction in several cases.
6. Development planning – planning for socio-economic development calls for base line data on various aspects of our society and economy, resource endowment, people needs etc.

7. Social welfare – help identify social evils and problems.

Ethics in Social Science Research-

- Research in social science often involves use of unethical practice.
- Issue of ethics are primarily out of research relation with
 - Sponsors of research
 - Those who permit access to source of data
 - Research participants respondent
- **Ethical issues of research Sponsorship:-**
 - Research may be funded by either research promotional bodies like research foundations, Indian Council of Social Science Research and similar council and university grants commission of research users like planning commission government department and business undertakings and financial institutions.
 - In the former case the funding takes the form of research grant and initiative is taken by the researcher himself.
 - He forwards his research proposal to the promotional body for research grant.
 - The granting Agency does not prohibit the publication fog the result for consumption by the scientific community.
 - A contracted research undertaken for sponsoring user organization specifies the nature of the work to be done, the time period of its completion and the conditions relating to the use of results.
- **Approval of access to data:-**

- A social science research may require collection of data from the document and records of an institution or from its employees.
- The permission from the head of the institution must be sought.
- The ethical issues that arise in the context are:
 - Should the nature of the research project and its objectives be indicated to the permission granting authority?
 - What should be the degree of annuity to be accorded to the institution concerned?
 - Should the procedure for handling data in ways assuring the degree of annuity guaranteed be stated?
 - Should the funding of the study be made available to the institution concerned? If so, in what form should be available.
- **Ethical issues related to respondent/subjects:-**
 - Sometimes people are made to participate in a research project without their knowledge or consent. Eg. In certain studies respondent are not aware that they are a part of a research, this is done out of the fear that their awareness of the research may affect the naturalness of their responses or behavior. Thus, the right of a subject to participate or not to participate is not considered.
 - In some researches, the consent of the respondents is obtained without informing them of the purpose of research. Such concealment naturally curtails the free choice of the respondent.
 - In some researches, the researcher may find it necessary to give incorrect information about the proposed research to potential subjects in order to manipulate their perceptions and such behavior such deception are regarded as questionable practices.
 - In studies relating to human values the social scientist may create opportunities for research subject to lie, steal or cheat.

- Another unethical practice is to expose participants to physical or mental stress with a view to study their reactions.
- A behavioral scientist may dig out information from respondents on private or personal matters such as marital life, religion, faith or personal opinions by employing techniques of participants observation, in-depth interview etc.
- Finally, there is an ethical issue relating to the obligation of maintaining the annuity of the research respondent of keeping research data in confidence.

Ethical dilemmas or benefits of research:-

- In the larger interest of developing useful knowledge, it is describe to strike a balance between the moral cost of unethical practices and the potential benefits of research.
- No doubt that researcher have an obligation to the research subjects but they have a greater social responsibility to find facts relevant to the solution of pressing human problems and thus promote social welfare.
- An evaluation of such potential benefits of research and the moral cost of unethical practice will provide the clue to the choice.
- When the benefits far exceed the moral cost, it is desirable to go ahead with the research even it calls for some ethical practice like concealing facts invasion of privacy of respondents etc.
- However, participants should not be exposed to physical or mental stress.
- Professional association must devise codes of ethics to be followed while obtaining information from individuals.
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TYPES OF RESEARCH

1. DESCRIPTIVE RESEARCH VS ANALYTICAL RESEARCH: - The term descriptive research means a research describing or narrating the facts or events in the situation. It includes a survey or fact finding enquiries giving description of the things as it which were found during the course of research .The purpose of this research is to give description of the state of affairs as it was found during the course of research. The researcher has no. scope to express his or her opinion in this type of research because there is no control over the variables in these types of research. It is also called as x-post fact research.

The term analytical research means a research which is confined for making analysis of the facts or information already available and the researcher makes critical evaluation of the material. So that an attempt is made to establish the relationship between the facts and expert comments are given by the researcher has a scope to express opinion on the outcome of research.

2. APPLIED RESEARCH VS FUNDAMENTAL RESEARCH:- The term applied research means a research which has practical application and it is conducted for finding a solution for immediate problem which may be in the society or industry. All mgmt. research is undertaken with an intention to find out solution to the problem which is available with the mgt. Methodology in research is applied because soon after the research is conducted it is used in business.

The term fundamental research means a basic research about a specific knowledge, discipline or area of study which is mainly concerned with the generalization and formulation of a theory. This research may be concerned with some natural phenomenon.

E.g. Study of human behavior fundamental research makes additions to the existing knowledge on the subject or discipline.

3. QUNANTITATIVE RESEARCH VS QUALITATIVE RESEARCH:- A research which is based on some kind of comparison with measurement in terms of quantity, at etc. This research is applicable to any situation which can be expressed in terms of quantity. In this case research findings are in numbers, figures or equations indicating some measurement.

Sometimes a research is concerned with qualitative phenomenon which is in comparative terms. There is no use of any measurement and the research aims at discovering the underlined motives and desires using the depth interview. This research is used in behavioral sciences and it helps to analyse various factors which motivate the people to behave in a particular manner. In qualitative research there is a need of psychologists to evaluate the behavior of a person.

4. CONCEPTUAL RESEARCH VS EMPIRICAL RESEARCH:- The term concerned with some theory or development of specific concept which is based on theory. This research is conducted by the philosophers and thinkers who develop new concepts or they give interpretation on the existing concepts. Conceptual research makes an attempt to add something's new to the existing knowledge.

The term empirical research means a research which relies upon evidence or experience or observations. It is a data based research which provides sufficient evidence to test the hypothesis.

5. OTHER TYPES OF RESEARCH:-

A. ONE- TIME RESEARCH:- A research which is conducted once for all to identify something that is known as one-time research. It is also called as single time period research.

B. LABORATORY RESEARCH:- A research which requires laboratory for conducting experiments is called as laboratory research. It requires a separate room for conducting experiments. So that proper solutions can be found for the research problem. It is also called as clinical diagnostic research.

C. EXPLORATORY RESEARCH:- A research in social sciences which explores the ideas in the situation is called as exploratory research. It requires enormous amount of knowledge on the part of researcher for exploring the ideas. This research includes development of hypotheses rather than testing it.

D. HISTORICAL RESEARCH:- When there is a study of ideas of past or something which is already happened i.e. Known as historical research. It is always concerned

with the past.

- E. **CONCLUSION - ORIENTED RESEARCH:-** Any research which has main objective to arrive at a specific inference i.e. called as conclusion oriented research. All managerial research is conclusion oriented research.

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PLANNING OF RESEARCH

❖ SELECTION OF PROBLEM OF RESEARCH

- The selection of problem is the first stage in research.
- The term problem means a question or issue to be examined. The selection of a problem for research is not an easy task; itself is a problem.
- It is least amenable to formal methodological treatment.
- Vision & imaginative insight play an important role in this process.

❖ SOURCES OF PROBLEM SELECTION

1. Reading: -

When we critically study books & articles relating to subject of our interest; pertinent questions may arise in our mind. Similarly, areas of research may strike to our mind when we read research projects.

2. Academic Experience: -

Classroom lectures, class discussions, seminar discussions etc.

3. Daily Experience: -

The new experiences that we undergo every day.

4. Exposure to field situation: -

Field visits, internship training & extension work provides exposure to practical problems, which called for studies.

5. Consultations: -

Discussions with experts, researchers, administrators & business executives.

6. Brainstorming: -

Intensified discussions with in a group of interested person may often be a means of identifying pertinent questions, developing new ideas.

7. Intuition: -

Sometimes-new ideas may strike.

8. Research: -

Research on one problem may suggest problems for further research.

❖ **STEPS IN THE SELECTION OF RESEARCH PROBLEM**

The process of identification of problems for academic research may consist of the following steps:

1. Selection of the discipline :

The discipline or subject in which proposes to do research may be selected. E.g. Economics, commerce, management, technology, psychology etc. The selection of the disciplines is easy. One can select any subject which researcher has studied thoroughly & which has interested him most where one has to do research in this field of specialization.

(e.g. mktg mgt. or finance mgt. or personal mgt.)

2. Determining the broad area or a particular aspect of the selected subject :

The second step is to select a particular aspect of the selected subject. E.g. if the selected subject is financial mgt., then one may select capital budgeting, financial leverage, working capital mgmt. or profit mgt. as specific area of study. One should identify ones specific interest. Interest in a particular area of a subject developed out of educational background, reading good books or inspirations received from a professor.

3. Identifying two or more specific topics in the selected broad area :

This is the final step in identification of a problem. This requires a group of branches of a subject. A review of concerned literature including research thesis & survey of research published by the research councils like Indian Council of Social Science Research, New Delhi; intensive reading & reflective thinking & discussion with a guide will help a student in identifying specific topics or issues of research. Both & uncharted path & a well-trodden path are dangerous to a beginner in research. If he chooses an unexplored problem he will be lost in the dark & may get frustrated. On the other hand, if he selects a problem, which has already been thoroughly studied, he may not learn anything nor contribute anything to the knowledge.

❖ ESSENTIALS OF A GOOD RESEARCH PROBLEM:

The research problem should interest the researcher & be a challenge to him. Without interest the researcher may not be able to get developed and sustained perseverance. Even a small difficulty may become an excuse for discounting the studies.

- The research problem should be competent to plan & carry out a study of the problem.
- The researcher must consider the availability of resources.
- The problem should be researchable, i.e. amenable for finding answers to the questions involved in it through scientific methods.
- The relative importance & urgency of the problem should be considered. An important & urgent problem should be given priority over an unimportant one.
- Novelty or originality should be seen in a research problem. There is no use of wasting ones time & energy on a problem already studied thoroughly by others.
- A problem may be a new one & imp, but research on it is not feasible, it cannot be selected.
- Suitable facilities like well-equipped library component, guidance data analysis etc. are to be considered.
- A research problem should make significant contribution to the concerned body of knowledge or to the solution of some significant practical problem.
- A research problem will be the one, which has potential personnel.

❖ REVIEW OF LITERATURE

- Knowledge is growing rapidly.
- It is doubled in very short span of time.
- Scholars, researchers & writers go on adding knowledge through their studies & writings.
- One who is not very conversant with has gone before has little chance of making a worthwhile. Therefore, a researcher has to survey the available literature relating to his field of study.
- He must keep himself updated in his field & related areas.

Literature

Literature in this context consists of:

A. Books :

Text books, Reference books, yearbooks. E.g. published as supplements to encyclopedias.

B. Journals :

Published monthly, quarterly, half yearly or annually.

C. Reports :

Reports of committees /commissions appointed by public institution.

D. Research dissertations & thesis.

E. Newspapers.

F. Micro forms :

audio & video tapes.

- The review of literature is not mere reading for reading sake. It is also not a casual reading like reading of story or novel.

- It is focused & directed towards specific purpose.
- It is also selective.
- A researcher has to select the kinds of literature to be reviewed & determine the purpose for which he has to study them.
- The literature review starts with the selection of a problem of research, continues through the various stages of research process & ends with report writing.

❖ IMPORTANCE OF REVIEW LITERATURE:

- It helps to gain background knowledge of the research topics.
- It helps in identifying the concepts relating to it, potential relationship between them & to formulate researchable hypothesis.
- Important to identify appropriate methodology, research design, methods of measuring concepts & techniques of analysis.
- Help in identifying data sources used by other researcher.
- Help to learn how others have structured the reports.

❖ RESEARCH DESIGN OR RESEARCH PROPOSAL

The term design means a plan, layout or a replica of something. The term research design means a logical & systematic planned design for directing a research study. It gives conceptual structure within which research is conducted. It constitutes the blue print for data collection, measurement & analysis. Research design gives outline of the research work to the researcher.

Definition

“A research design is the arrangement of condition for collection & analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.”

According to Kerlinger, “Research design is a plan & structure & strategy of Investigation consists so as to obtain answers to the questions and control variance.”

This definition consists of three important terms.

- Plan
- Structure
- Strategy

- ✓ Plan: - Plan is the outline of research schemes on which the researcher has to work.
- ✓ Structure: - Structure is the most specific outline on scheme.
- ✓ Strategy: - Strategy shows how the research will be carried out.

❖ TYPES OF RESEARCH DESIGN

1. Exploratory Research Design:-

In this type of a design, the focus is on discovery of ideas. It is generally based on secondary data that is readily available. It does not have formal & rigid design. It is preliminary investigation where researcher is not sufficiently knowledgeable unable to form detailed research question.

Since objective is to generate new ideas, respondents should be given sufficient freedom to express themselves. Sometimes group interviews are held, such interviews may be helpful to respondents to check their knowledge & participate in the discussion without any reservation. Interviewer should not interfere in the flow of the interview as long as the interview is not side tracking the main issue.

In short, an exploratory design is used for any or all of the following purpose:-

- Formulating a problem for more investigation or for developing hypothesis.
- Establishing priorities for further research.
- Gathering information about the practical problems for carrying out research on particular conjectural statements.
- Increasing the analysis familiarity with problem clarifying the concept.
- Exploratory study does not involve formal design & probability sampling plans – Ingenuity and judgement.
- Notwithstanding the flexibility the research experience has demonstrated that;
 - i. Literature survey
 - ii. Experience survey

iii. Analysis of selected cases is particularly productive in exploratory research design.

i. Literature survey:-

- One of the most economical & quickest ways to discover hypothesis is the work of others, through literature surveys.
- For this purpose, a large volume of published & unpublished data is available which can be scanned in a relatively small period of time.
- More useful source of such information is books, newspaper, government documents etc.

ii. Experience surveys:-

- Individuals with expertise knowledge & ideas about research subject may be questioned.
- Such people include top executives sales manager & other relevant people.
- This process does not include a scientifically conducted statistical survey rather it reflects an attempt to get all available information from the people who have some particular knowledge of subject under investigation.

iii. Analysis of selected cases:-

- Usual pattern for exploratory research is the arbitrary selection of a few extreme examples & thorough analysis of these.
- In some instances detailed & intensives case analysis of a few selected individuals or organization may particularly be helpful in gaining ideas about possible relationships.

2. Descriptive Research Design:-

- This study is also called as explanatory design.
- This is the one that simply describes something such as demographic characteristics of consumers who use the product.
- The descriptive study is typically concerned with determining frequency with which something occurs or how two variables act together.

- Descriptive design is used when the purpose of research is covered under one or more of the following : -
 - To describe the characteristics of certain groups. E.g. Users of a product with different age, sex, education etc.
 - To estimate the behaviour of people in a specified population who behave in a certain way. E.g. frequent shoppers.
 - To make specific estimations. E.g. sales of a company's product in each of the next 5 years.
 - To determine whether certain variables are associated. E.g. Income & usage of product.
- Descriptive study is characterized by its rigid & formalness

A. Case research design:

- It is most formal research design.
- It can be carried out in the area such as a survey of consumer attitude towards a new product concept or it may be conducted in a library by the survey of available secondary data.
- But it is generally used for collecting cases.
- The collected cases are the typical studies generally used to find time features :-
 - a. Features which are common to all the cases.
 - b. Features which are not common to all the cases.
 - c. Features which are unknown to specific cases.

B. Statistical Design:

- It is different from the case research with regard to a number of cases studied and comprehensive of the study of each case.
- From analysis point of view the descriptive studies are of two types:
 - Longitudinal Analysis (panel Research)

These studies are based on panel data & panel methods. The information from this panel is collected on a continuing basic. The respondents here may be stores, dealers, Individual or other entities.

- Cross Sectional Analysis

There are two types of cross sectional analysis, field studies and survey. The basic difference between these two is the greater scope of the survey & greater depth of field study. The survey has a greater sample. The emphasis of survey is the generation of summary statistics. The emphasis of field study is the inter relationship of a number of factors.

3. Causal Research Design / Analytical Research Design

- It is the third type of research design.
- It is also a research design used for hypothesis testing research studies.
- As the name indicates, causal design investigates the cause & effect relationship between two or more variables.
- This design measures the extent of relationship between the variables.
- Causal research design attempts to specify the nature of functional relationship between two or more variables.
- It is useful to show the impact of one variable on the other.
- e.g.: Price & market demand or relationship between market competition & sales performance.
- Even the positive / negative effect of advertisements on sales can be studied through causal research. The relationship between the causal factors can be studied through causal research.
- In addition the variables which create effect on other variables can be studied in depth through causal research.
- Data for causal research can be collected through field survey with the help of a questionnaire or by conducting laboratory experiments / controlled experiments.
- Laboratory experiments are possible in case of testing of new products or package design.
- The causal research design is based on researching the design for causal research which can be divided into three categories:
 - ✓ Interview
 - ✓ Survey
 - ✓ Experimental.

❖ CONTENTS OF A RESEARCH DESIGN

The research design/plan of a research may cover the following essential section:

1) Introduction:-

The introduction of a research plan or proposal should place the research purpose, state the need for studying it & the researchers interest in the study of the problem.

2) Statement of the problem:-

This research problem should be well defined pointing out its core nature & importance.

3) Review of the previous studies:-

On the selected theme, some studies might have been previously made by others. A review of available literature will bring out information on them which will help in finding the research gap.

4) Scope of the study:-

The scope & dimensions of the study should be delimited with reference to the topical scope-breadth & depth, geographical areas to be covered, reference period etc.

5) Objectives of the study:-

The specific objectives of the study should be stated clearly. These refer to the question to which the researcher prepares to seek answers through the study.

6) Conceptual Model:-

This section is the heart of the research plan. Here, researcher formulates & develop the structure of relationships among the variables he is investigating.

7) Hypothesis :-

These are logically reduced from the theoretical framework above. This refers to the anticipated outcome or possible answers to the research questions.

8) Operational definitions or concepts:-

The major concepts used in the title of the study, its objectives, the investigation, question & the hypothesis should be identified & defined in operational terms.

9) The significance of the study:-

It is important to point out the relevance & significance of the investigation. The value of the findings of the study for policy formation, theory or practice is noted.

10) Geographical areas to be covered:-

It includes the territorial area to be covered. To be specified which depends on the purpose, time & resources available for the study.

11) Reference period:-

This period may be one year or two or more year depending on nature of study.

12) Methodology:-

It contains typology of the design, experimental and descriptive survey, case study or historical survey. It includes methods to be adopted for data collection, interviews, observation etc.

13) Sampling Plan:-

If the study requires primary data, the universe must be divided & the methods of sampling to be used for drawing samples & sample size must be stated.

14) Tools for gathering data:-

The tools for gathering data are to be specified such as interview should questionnaire, guide, check list etc.

15) Plan of analysis:-

The statistical techniques to be used for analyzing the data collected should be specified.

16) Chapter scheme:-

The chapter scheme is to be prepared for communicating findings of the study & purpose of each chapter to be stated.

17) Time budget:-

The time budget and period required for each stage of work & the total time duration of the study to be specified.

18) Financial budget:-

It should include estimate of cost of the project under various major categories like salary, printing, travel, stationery etc.

CHAPTER III

CENSUS SURVEY AND SAMPLE SURVEY

CENSUS SURVEY V/S SAMPLE SURVEY OR SUPERIORITY OF SAMPLE SURVEY OVER CENSUS SURVEY

The process of designing a field study among other things, involves a decision to use sampling or not. The researcher must decide whether he should cover all the units or a sample of units, when all the units are studied, such a complete coverage is called a census survey. When only a sample of the universe is studied, the study is called as a sample survey.

In making this decision of census or sampling, a certain points or factors of superiority of census survey over sample survey are to be considered.

1) The size of the population:-

If the population to be studied is relatively small, say 50 institutions, or 200 employees or 150 households, the investigator may decide to study the entire population. The task is easily manageable and the sample may not be required. But if the population to be studied is quite large, sampling is warranted. However, the size is a relative matter. Whether a population is large or small depends upon the nature of the study, the purpose for which it is undertaken for and the time and other resources available for it.

2) Amount of funds budgeted for the study:-

The decision regarding census or sample depends on the budget of the study. Sampling is opted when the amount of money budgeted is smaller than the anticipated cost of census survey.

3) Facilities:-

The extent of facilities available like staff, access to computer facility and accessibility to population elements is another factor to be considered in deciding to use sample or not. When the availability of these facilities is extensive, census survey may be manageable otherwise, sampling is preferable.

4) Time:-

The time limit within which the study should be completed is another important factor to be considered in deciding the question of census or sample survey. This, in fact, is a primary reason for using sampling by academic and marketing researchers.

5) It provides better accuracy.

6) It saves labour.

7) It provides quick results of the research.

SAMPLING

Meaning of Sampling:-

Data collected from each and every member of the population is called as census survey. It is difficult to collect data from a large population. Therefore a small number of people, representing the entire population are selected for intensive study. This is called "Sampling". In marketing research sampling is particularly used to collect the primary data.

Definition of Sampling:-

According to Donald Tull and Dell Hawkins, "Sample means those individuals chosen from the population of interest as the subjects in an experiment or to be the respondents to survey."

In other words, sampling is the selection of part of an aggregate or totality on the basis of which a judgement or inference about the aggregate or totality is made. Sampling believes that, larger the size of the sample, more accurate the results and vice-versa. Sampling is an effective alternative to census survey.

Features of Sampling:-

1) Sampling is an effective alternative to census survey.

2) Sample is an essential element of all scientific research and human life.

- 3) Sample survey findings are more reliable, when the sample is randomly selected and is a true representative of the population.
- 4) Larger the size of a sample more accurate the results are and vice-versa.

Merits of Sampling

- 1) It enables the researcher to collect detailed information that would otherwise be impossible with census survey. Similarly, specialised information too can be collected as the numbers of respondents are less.
- 2) Sample survey findings are more reliable, when sample is randomly selected and is a true representative of the population.
- 3) It saves time; efforts, cost and energy since the number of people to be interviewed are small in number.
- 4) This method is an estimate of characteristics of population in a shorter time. If one decides to use census method, it will take years to complete it.
- 5) Since scale of operations involved are small, quality of the interviewing, supervision and other related activities can be better than the quality in a census survey.

Demerits of Sampling

- 1) As compared to the census technique, the findings of a sample survey are less accurate.
- 2) Sampling gives rise to certain errors. If these errors are too large, the results of the sampling will be of limited use.
- 3) If the sample selected, does not possess the characteristics of the population the conclusions derived will be misleading and inaccurate.
- 4) Practically, it is difficult to select suitable size of the sample having similar features of the population.
- 5) While in census survey, it is easy to check the omissions of certain units, this is not so in sample survey.

Various/Basic terms used in sampling

1. Population/Universe

- i. Population is defined as “the total number of elements with certain characteristics and which form the subject of study in a particular survey”.
- ii. Population can be any group of people or objects or units (like computer) possessing certain specified characteristics.
- iii. This term is applied to finite or infinite collection of individuals.
- iv. Populations possess certain features which can be identified and classified according to survey needs.

2. Census

- i. Census means complete enumeration or counting of population with respect to a specified time and well defined objectives.
- ii. It is rarely conducted in commercial research, because it requires huge amount and resources.
- iii. The Government of India conducts population census after every 10 years and provides vital data on demographics, social and economic aspects of population.

3. Sample

- i. Sample is a small part of the population taken up for intensive examination and study purpose.
- ii. It means a small part representing the entire population, having similar characteristics.

4. Sampling unit

- i. It refers to any type of element of the population to be selected for study purpose.
- ii. It is the basis on which the sample is selected.
- iii. Example: People, retail stores, products or college students etc. can make up a sample unit.

5. Sampling errors (Systematic errors)

- i. A sample is an exact miniature (representation) of the total population.
- ii. The difference between the unknown values of population (parameters) and the values obtained from the sample (statistics) are sampling errors.
- iii. Sampling errors may arise due to sample size i.e. either too small or too large or sample characteristics i.e. non-representative.

6. Sampling Frame

- i. A sampling frame may be a list or directory or register of members or index, maps and other records of population from which a sample can be selected.
- ii. Example 1: A telephone directory can be the sampling frame for selecting respondents for telephone survey.
- iii. Example 2: A register or list of all the members of medical association can be the sampling frame for selecting respondents for survey related to doctors or medicine.

Methods or Techniques of Sampling

Methods of Sampling



A) Probability Sampling

- 1) Simple Random Sample
- 2) Systematic Sampling
- 3) Stratified Random sampling
- 4) Cluster Sampling
- 5) Multistage & Multiphase Sampling
- 6) Area Sampling

B) Non-Probability Sample

- 1) Accidental Sampling
- 2) Convenience Sampling
- 3) Judgement Sampling
- 4) Purposive sampling
- 5) Quota Sampling
- 6) Snowball Sampling

A. Probability Sampling Method

- It is also known as random sampling.
- In case of probability sampling method, each element of the population has known chance or opportunity of being selected in the sample.
- For Example: If a sample of 100 students is to be selected from a population of 1000 students then it is known to everyone that each student has $1000/100^{\text{th}}$ i.e. 1 chance in 10 of being selected.

Feature of Probability Sampling

- It is the systematic and objective method of sampling.
- The results of probability sampling are more accurate and reliable.
- It helps in the formulation of a true representative sample by eliminating human biases.
- It is a mechanical method rather than mental process of sampling.
- Statistical treatment can be given to the observation obtained.
- It is theoretical and mathematical based method of sampling.

Methods of Probability Sampling

1. Random or Simple Random Sampling

- This method is also called as ‘Representative Sampling’.
- Under this sampling, each member of the population has a known and equal chance of being selected.
- It is suitable for selecting a sample from a systematic and objective method of sampling.
- It is done through lottery method or random tables.

a. Lottery Method

- Here, every unit of the population is identified with a number of slip or chits.
- These small numbers of chits are placed in a box mixed well and then a person is asked to pick up the lucky chit.
- This process is continued till the required size of the sample is achieved.

b. Random Tables

- It means use of random numbers specially designed for sampling purposes.
- Such random tables are found at the end of statistical textbook.

Features of Random Sampling

- It is a systematic and objective method of sampling. It provides equal chance to every element of being selected.
- Results are more accurate and reliable.

- This method helps in formulation of true representative sample by eliminating human bias.
- It is most commonly used technique because it sounds theoretical and mathematical based.

2. Systematic Sampling:-

It is a modification of simple random Sampling. It is also called as 'quasi-random sampling' because it fall between probability & non- probability sampling.

The procedure of quasi sampling begins with finding out the sample interval. This can be found out by the ratio of the population to the Sample. After words a random no. is selected from the Sample interval.

E.g. Selecting a Sample of 50 students out of 500, the Sample interval will be 500 divide by 50 i.e. 10 then made small chits bearing nos. 1 to 10 & put them into a box. After words, by using lottery method, withdraw on slip suppose starting with 4 with a regular interval of 10. The selected sample consists of elements bearing nos. 4, 1424.

Up to selecting no.4, Systematic Sampling can be traded as probability sampling & afterwards. It is non-probity because the chances of the elements are certainty affected. In the above e.g., numbers other than 4 have no. chance of being selected. This method is often used in selecting name from telephone or city directories or almost any type of list.

The merit of this method is that it is most convenient to adopt than the, Sample random method is relatively less. If the population is sufficiently large, systematic sampling can often be expected to yield results that are similar to those, obtained by any other efficient method.

The demerit of this method is that it is a lesser representative design than simple random sampling if we are dealing with a population having hidden periodicities. There is also a chance of bias in results.

3. Stratified Random Sampling:-

This method of Sampling is used when a population from which a Sample is to be drawn does not constitute a homogeneous group. In this method, the population is divided & subdivide with homogeneous or similar Characteristics into several groups. This group is known as 'Strata' population can divide on the basis of age, sex, education, income etc. the results, obtained through this method, are more accurate & representative.

It is not necessary that Stratification should be done keeping in view a single characteristic; population is often stratified according to several characteristics. Stratified sampling can be classified into 2 categories such as proportionate & dis- proportionate for e.g. for a given study, the population is students from a particular college. Then the population is students is further classified, i.e. stratified or Segmented into group such as F.Y., S.Y, & T.Y.B.Com Students. Afterwards, from each Strata a proportional Sample units are drawn by either using random Sampling or Systematic Sampling methods.

4. Cluster Sampling:-

Cluster means groups, sampling units are selected in groups. Cluster Sampling is an improvement over Stratified sampling. Both simple & stratified random sampling is not suitable when dealing with large & geographically scattered populations. Large Scale sample surveys are conducted one cluster sampling basis.

In cluster sampling, the total population is divided into number of relatively small subdivisions which are themselves clusters of still smaller units & there some of these clusters are randomly selected of inclusion in overall sample. E.g. suppose the researcher wants to study the learning habits or the attitude towards McDonalds of the college students from pune for this, the researcher may select the sample as under.

- i. Then, select sample from colleges on random basis suppose, there are 200 colleges in pune, then he may select 20 colleges by random method.
- ii. From these 20 colleges, prepare a list of all students; from the list select the required number of say 1000 students on random basis.

Cluster sampling is done in stages. It means the population is first divided in sampling units & a sample is taken. The Sampling unit is sub-divided into 2nd Stage units. This process can be continued further, if necessary. It reduces the cost by concentrating surveys in selected clusters.

Cluster sampling possesses the economic advantages. The estimates based on Cluster Samples are usually more reliable. It is useful where the population under study is widely composition of population is adequate.

5. Area sampling

It is method of cluster sampling and is used in connection with selection of sample area. Sampling is to divide the large areas into several small areas.

A random selection of this is made within each of the area selected. A sub-sample of residence is taken and then investigated. For Example: For a particular study, the city of Mumbai can be divided on the basis of municipal wards or zones then it is called area sampling.

6. Multi-stage & Multi-phase sampling:

Multi-stage sampling is carried out in steps or stages. It is further development of the principle of cluster sampling. This method is regularly used in conducting national survey on large scale. It is an economical and time saving method of selecting a sample out of widely spread population. In this method, first the population will be divided on the basis of state then districts, then cities, then locality, wards, individuals who are sample of different stages until a final sample unit i.e. individuals is defined.

Example: Suppose the researcher wants to find out the popularity of particular serial on the national networks. First he will select some states; he will then select randomly some districts and So on. This will continue till he selects a sample of individuals.

Multi-phase sampling is slightly different from multi-stage sampling. The sampling unit of each phase are the same but some of these are interviewed in detail or asked more questions than others.

In other words, all the members of the sample provide basic information and some of these provide more and detailed information. This way of conducting surveys saves time, cost, excludes unimportant information and further, the data collected from all members can be compared with responses of those who are asked to give more details.

B. Non-probability sampling

- It is also called as judgment sampling.
- This method believes in selecting the sample by choice and not by chance.
- This method is treated as arbitrary sampling because the samples are drawn by the researcher himself.
- Here, the size of the sample of the sampling units is decided by the researcher only.
- But it suffers from the defects like personal bias and sampling errors which cannot be estimated.
- Since it is an unscientific and less accurate method of sampling; hence, it is used occasionally.

➤ **Methods of Non-probability sampling:**

I. Accidental sampling

Under this method, the researcher simply selects those units/individuals as samples who are immediately available without taking special efforts to select the sample. Suppose, the researcher wants to survey 200 people, and then he may consider the first 200 persons he comes across for collecting info. This method is generally used by journalists to know public view on a particular issue. It is less expensive & time saving method. It is quite useful where too much accuracy is not required.

II. Convenience Sampling

In this method, the sample is selected as per the convenience of the researcher, Samples selected from the telephone directory, pay- role register, register of members is a

type of convenience Sampling. A researcher selects only those objects which are readily available with little efforts:-

This method is useful only in the initial stages where the researcher is searching for ideas. E.g. If a researcher is staying in a particular part of a city, then he will select the respondents staying in the same part of the city.

III. Judgement Sampling

The Sample selected that is based on Someone's knowledge, experience & personal judgement is called judgemental sampling. For selecting a sample of resident from a locality, the researcher may ask & take help from those who are well acquainted with the locality. The researcher relies on the experience of seniors because they have wider experience & better knowledge about the locality than the researcher. This method is more representative in nature.

IV. Purposive Sampling

In this method, sample is deliberately selected to achieve some well-defined objectives. This method suffers from the defect of personal bias.

E.g. To prove that a particular type of soap or toothpaste is used by members of a particular community or income group the researchers will include only those who belong to that particular community or income groups.

V. Quota Sampling

Quota Sampling method is similar to one adopted in stratified sampling here also the population is divided into strata on the basis of characteristics of population the basic objective of Quota sampling is to control biases arising out of non- probability method E.g. a Sample of 20 students can be selected from a group of 100 students comprising of 60 boys & 40 girls. To make the sample representative, the group of 20 should include 12 boys & girls (i.e. $60:40 = 3:2$)

It is generally done in stages the population to be sampled is classified as per data needs. E.g.:- age, Income, education etc. then the proportion of the population falling under

each class is found out & then each observer or interviewer is assigned a quota of informants. The quota is fixed in such a way that the composition of the sample maintains the same proportion among the classes of the population.

This method offers the benefits of speed, economy & simplicity. It is widely used in market surveys & public opinion polls. The demerit is that the quotas are fixed by the researchers who may be more interested in fixing quotas to suit his convenience.

VI. Snowball Sampling

This is the colourful name for a technique of building up a list or a sample of a special population by using an initial set of its members as information.

E.g. if a researcher wants to study the problem faced by Indians through some sources like Indian embassy then he can ask each one of them to supply names of others, Indians known to them & this procedure continues until he gets an exhaustive list for which he can draw a sample or make a census Survey.

CHAPTER III

CENSUS SURVEY AND SAMPLE SURVEY

CENSUS SURVEY V/S SAMPLE SURVEY OR SUPERIORITY OF SAMPLE SURVEY OVER CENSUS SURVEY

The process of designing a field study among other things, involves a decision to use sampling or not. The researcher must decide whether he should cover all the units or a sample of units, when all the units are studied, such a complete coverage is called a census survey. When only a sample of the universe is studied, the study is called as a sample survey.

In making this decision of census or sampling, a certain points or factors of superiority of census survey over sample survey are to be considered.

8) The size of the population:-

If the population to be studied is relatively small, say 50 institutions, or 200 employees or 150 households, the investigator may decide to study the entire population. The task is easily manageable and the sample may not be required. But if the population to be studied is quite large, sampling is warranted. However, the size is a relative matter. Whether a population is large or small depends upon the nature of the study, the purpose for which it is undertaken for and the time and other resources available for it.

9) Amount of funds budgeted for the study:-

The decision regarding census or sample depends on the budget of the study. Sampling is opted when the amount of money budgeted is smaller than the anticipated cost of census survey.

10) Facilities:-

The extent of facilities available like staff, access to computer facility and accessibility to population elements is another factor to be considered in deciding to use sample or not. When the availability of these facilities is extensive, census survey may be manageable otherwise, sampling is preferable.

11) Time:-

The time limit within which the study should be completed is another important factor to be considered in deciding the question of census or sample survey. This, in fact, is a primary reason for using sampling by academic and marketing researchers.

12) It provides better accuracy.

13) It saves labour.

14) It provides quick results of the research.

SAMPLING

Meaning of Sampling:-

Data collected from each and every member of the population is called as census survey. It is difficult to collect data from a large population. Therefore a small number of people, representing the entire population are selected for intensive study. This is called "Sampling". In marketing research sampling is particularly used to collect the primary data.

Definition of Sampling:-

According to Donald Tull and Dell Hawkins, "Sample means those individuals chosen from the population of interest as the subjects in an experiment or to be the respondents to survey."

In other words, sampling is the selection of part of an aggregate or totality on the basis of which a judgement or inference about the aggregate or totality is made. Sampling believes that, larger the size of the sample, more accurate the results and vice-versa. Sampling is an effective alternative to census survey.

Features of Sampling:-

5) Sampling is an effective alternative to census survey.

6) Sample is an essential element of all scientific research and human life.

- 7) Sample survey findings are more reliable, when the sample is randomly selected and is a true representative of the population.
- 8) Larger the size of a sample more accurate the results are and vice-versa.

Merits of Sampling

- 6) It enables the researcher to collect detailed information that would otherwise be impossible with census survey. Similarly, specialised information too can be collected as the numbers of respondents are less.
- 7) Sample survey findings are more reliable, when sample is randomly selected and is a true representative of the population.
- 8) It saves time; efforts, cost and energy since the number of people to be interviewed are small in number.
- 9) This method is an estimate of characteristics of population in a shorter time. If one decides to use census method, it will take years to complete it.
- 10) Since scale of operations involved are small, quality of the interviewing, supervision and other related activities can be better than the quality in a census survey.

Demerits of Sampling

- 6) As compared to the census technique, the findings of a sample survey are less accurate.
- 7) Sampling gives rise to certain errors. If these errors are too large, the results of the sampling will be of limited use.
- 8) If the sample selected, does not possess the characteristics of the population the conclusions derived will be misleading and inaccurate.
- 9) Practically, it is difficult to select suitable size of the sample having similar features of the population.
- 10) While in census survey, it is easy to check the omissions of certain units, this is not so in sample survey.

Various/Basic terms used in sampling

7. Population/Universe

- v. Population is defined as “the total number of elements with certain characteristics and which form the subject of study in a particular survey”.
- vi. Population can be any group of people or objects or units (like computer) possessing certain specified characteristics.
- vii. This term is applied to finite or infinite collection of individuals.
- viii. Populations possess certain features which can be identified and classified according to survey needs.

8. Census

- iv. Census means complete enumeration or counting of population with respect to a specified time and well defined objectives.
- v. It is rarely conducted in commercial research, because it requires huge amount and resources.
- vi. The Government of India conducts population census after every 10 years and provides vital data on demographics, social and economic aspects of population.

9. Sample

- iii. Sample is a small part of the population taken up for intensive examination and study purpose.
- iv. It means a small part representing the entire population, having similar characteristics.

10. Sampling unit

- iv. It refers to any type of element of the population to be selected for study purpose.
- v. It is the basis on which the sample is selected.
- vi. Example: People, retail stores, products or college students etc. can make up a sample unit.

11. Sampling errors (Systematic errors)

- iv. A sample is an exact miniature (representation) of the total population.
- v. The difference between the unknown values of population (parameters) and the values obtained from the sample (statistics) are sampling errors.
- vi. Sampling errors may arise due to sample size i.e. either too small or too large or sample characteristics i.e. non-representative.

12. Sampling Frame

- iv. A sampling frame may be a list or directory or register of members or index, maps and other records of population from which a sample can be selected.
- v. Example 1: A telephone directory can be the sampling frame for selecting respondents for telephone survey.
- vi. Example 2: A register or list of all the members of medical association can be the sampling frame for selecting respondents for survey related to doctors or medicine.

Methods or Techniques of Sampling

Methods of Sampling



B) Probability Sampling

- 7) Simple Random Sample
- 8) Systematic Sampling
- 9) Stratified Random sampling
- 10) Cluster Sampling
- 11) Multistage & Multiphase Sampling
- 12) Area Sampling

B) Non-Probability Sample

- 1) Accidental Sampling
- 2) Convenience Sampling
- 3) Judgement Sampling
- 4) Purposive sampling
- 5) Quota Sampling
- 6) Snowball Sampling

C. Probability Sampling Method

- It is also known as random sampling.
- In case of probability sampling method, each element of the population has known chance or opportunity of being selected in the sample.
- For Example: If a sample of 100 students is to be selected from a population of 1000 students then it is known to everyone that each student has $1000/100^{\text{th}}$ i.e. 1 chance in 10 being selected.

Feature of Probability Sampling

- It is the systematic and objective method of sampling.
- The results of probability sampling are more accurate and reliable.
- It helps in the formulation of a true representative sample by eliminating human biases.
- It is a mechanical method rather than mental process of sampling.
- Statistical treatment can be given to the observation obtained.
- It is theoretical and mathematical based method of sampling.

Methods of Probability Sampling

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