MODULE 3

Social Research Methods

Social Research

Social Research is a method used by social scientists and researchers to learn about people and societies so that they can design products/services that cater to various needs of the people.

- Different socio-economic groups belonging to different parts of a county think differently. Various aspects of human behaviour need to be addressed to understand their thoughts and feedback about the social world, which can be done using Social Research. Any topic can trigger social research – new features, new market trends or an upgrade in old technology.

- Social science study entails a thorough examination of all facets of human behaviour and interaction.
- When it comes to conventional empirical topics, psychology looks at individual acts, while sociology looks at groups and their actions.
- Educational research may be thought of as an effort to broaden our understanding of cognitive, influential, and psychomotor domains in teaching and learning contexts, building on psychological and sociological knowledge.
- Many topics, including nursing, health sciences, business, economic, political science, and law, deal with similar issues and employ a variety of research methods.

Definition

❖ According to C.A. Moser: **"Social research is a systematised investigation to gain new knowledge about social phenomena and problems."**

❖ According to P.V. Young: **"Social research is a scientific undertaking which, by means of logical methods, aims to discover new facts or old facts and to analyse their sequences, interrelationships, causal explanations and natural laws which govern them."**

Objectives of Social Science Research

- The aim of social science research is to find new facts or confirm and evaluate old ones.
- It aims to comprehend human behaviour as well as its interactions with the world and social institutions.
- It seeks to establish a causal link between human activities and the natural laws that regulate them.
- To create new research instruments, principles, and hypotheses that will make the study of
- human behaviour and social life are more accurate and legitimate.

Types of research

While any classification of research is necessarily subjective, research may be categorised in a crude manner based on its main purpose or methods. Research can be divided into the following categories based on its purpose: **– pure and applied, exploratory, descriptive, diagnostic, quantitative, qualitative, cross sectional and longitudinal research.**

1.PURE AND APPLIED RESEARCH

Pure Research

- Pure research is conducted solely for the purpose of gaining knowledge without any intention of applying it in practice.
- Pure research is often referred to as fundamental or basic research. It is done out of intellectual inquisitiveness or curiosity.
- It isn't all about solving problems. Its aim is to broaden awareness. It may result in the creation of a new theory or the improvement of an existing one
- Pure research has played a significant role in the advancement of various sciences.
- Pure research results add to the storehouse of information that can be used to develop significant practical research in the future.
- Natural knowledge sought for its own sake without regard for potential utility can often produce outcomes of the most surprising nature and of the greatest practical significance.
- Pure research thus serves as a base for applied research.
- Pure research results paved the way for a slew 11 of scientific and technical breakthroughs, including the steam engine, computers, cars, electronic gadgets, electronic data processing, telecommunication, and so on, all of which have revolutionised and enriched our lives.

Applied Research

Applied research is conducted to find a solution to a real-world issue that necessitates a decision or action. As a result, it is problem-focused and action-oriented. It is looking for a fast and realistic result

.eg., marketing research carried on for developing a new market or for studying the post-purchase experience of customers.

Applied research in the fields of technology, management, commerce economics, and other social sciences has a lot of potential. There are several issues in these fields. They need empirical research in order to find solutions. Though the immediate goal of applied research is to find solutions to a practical problem, it may also be used for other purposes.

It may help to improve theoretical knowledge by contributing to the discovery of new evidence, the testing of a theory, or the clarification of concepts. Goode and Hatt have highlighted the mutual contribution between pure and applied research.

2. Exploratory or Formulative research

Exploratory research is a form of preliminary investigation into a new problem about which the researcher knows little or nothing. It's similar to a doctor's initial examination of a patient with an unknown illness in order to gather information that can help them identify it.

"It's disorganised, and it's less focused on predetermined goals." It is normally conducted as a pilot study. It is, however, a different form of study. It's best to think of it as the first step in a three-step process of discovery, definition, and experimentation.

The purpose of an exploratory study may be:

➢ **To come up with new ideas or**
➢ **To improve the researcher's understanding of the issue or**
➢ **To formulate the problem in a precise manner or**
➢ **To collect data for the purpose of clarifying concepts or**
➢ **Determine if the study is feasible to carry out.**

After devoting a great deal of time and effort to a research project, a scientist will discover that obtaining the necessary data is impossible. A preliminary

investigation may help prevent such disappointment. For example, students decided to look into the marketing strategies of large manufacturing companies. The ability of marketing executives to divulge sufficient details about their marketing strategies was a crucial prerequisite for this report. They will not, according to an investigation.

3. Descriptive research

A descriptive analysis is a fact-gathering inquiry that is properly interpreted. It is the most basic form of study. It is more focused than an exploratory analysis since it focuses on concrete aspects or dimensions of the issue under investigation. Its aim is to collect descriptive data and provide information for the development of more complex studies. Data is gathered by one or more of the following methods: observation, questioning, and mailing questionnaire.

Objective

Descriptive research seeks to classify the different characteristics of a group, entity, or issue under investigation, but it does not include hypothesis or proposition testing. It can, however, reveal potential relationships between variables, laying the groundwork for a more in-depth investigation later. A descriptive analysis often seeks to classify the various elements that make up the study's subject matter.

Two conditions must be met for the classification to be complete:

(1) exhaustiveness (2) mutual exclusivity.

Exhaustiveness is achieved when all of the essential elements have been found. When each object in the system can be put unambiguously in just one group, it is mutual. Explanation, prediction, and understanding should all be possible with descriptive data.

Usefulness

The descriptive studies are useful in their own way.

- They may make a significant contribution to the advancement of a young science by focusing descriptive knowledge on a theoretical stage. It may be beneficial for empirically verifying focal principles. **"The better the description, the more likely the units extracted from the description would be useful in subsequent theory construction."**
- Descriptive data may draw attention to important methodological aspects of data collection and analysis. The processing of factual data raises our understanding of our measuring devices' relative accuracy. As a result, our desire to learn more has greatly increased.
- 3. The descriptive data gathered during a study can be used to make predictions about aspects of social life that aren't covered by the study.
- Descriptive research is useful for gathering information that can be used to organise social action programmes.

Limitations

- The researcher might use definition as a means to an end. Facts must be discovered as a result of study.
- Despite the fact that social science issues are ongoing and have a history and future, the researcher can become fixated on the present.
- The researcher may have a tendency to use statistics excessively. It is important to consider the limitations of statistical analysis when performing it.

4. Diagnostic study

This is similar to a descriptive analysis, but it focuses on something different. It aims to figure out what's going on, why it's happening, and what can be done about it. Its aim is to figure out what's causing a problem and how to fix it.

Purpose

A diagnostic study may also be concerned with determining and evaluating whether certain variables are related, such as whether people from rural areas are better suited to work in bank rural branches. Do villagers vote for a single group in greater numbers than city voters?

Requirements

Prior knowledge of the problem, its detailed formulation, a specific definition of the given population, appropriate methods for collecting accurate information, precise calculation of variables, statistical analysis, and test of significance are all criteria for both descriptive and diagnostic studies. Since the aim is to collect full and reliable details about a specific circumstance or phenomenon, the research design must provide much more safeguards against bias than an exploratory analysis. Furthermore, since the amount of work involved is significant, concern for the research effort economy is critical.

5.Qualitative Research in social science

Qualitative research is a general term that refers to a number of interpretive research methods. It can be historical, sociological, educational, and a variety of other topics. In social science, qualitative research is less concerned with scientific logic and more concerned with the world around us. Quantitative research focuses on human nature in order to get a deeper understanding of the environment.

Quantitative researchers place a strong focus in their studies on examining people's or groups' viewpoints, such as their thoughts, beliefs, motivations, and intentions.

The primary aim of qualitative research is to gain a better understanding of social processes rather than to collect a representative sample. The investigation of a single or limited number of cases over a long period of time. Some of the features of qualitative research approaches such as in-depth interviews and participant observation are as follows: The research is done in a

secure environment. The goals of qualitative research are to collect accurate accounts of people's actions and thoughts. During the research process, the research emphasis can change. Rather than theory research, the qualitative approach focuses on theory development.

6.Quantitative research in social science:

In social science, quantitative methods are often correlated with positivist viewpoints. Hamersley provides a useful definition of this approach. "The term quantitative method refers in large part to the adoption of the natural science experiment as the model for scientific research, its key features being quantitative measurement of the phenomena studied and systematic control of the theoretical variables influencing those phenomena ". As a result, the most important characteristics of quantitative research are,

I. Collecting data using structured methods.

II. Identifying and elucidating causal relationships between variables.

III. Puts assumptions or theories to the test.

IV. Extensive pre-conceptualization.

V. primarily consider theory and then research

The sample survey and experimental method are the most typical examples of quantitative research. Sample survey is the most commonly used technique with specific tools and methods to gather information about a particular question. Quantitative approaches differ from qualitative approaches in a number of ways. E.g., in terms of objectives of the study, research design, tools and methods etc.

Quantitative Research	Qualitative Approach
Involves a deductive approach to the relationship between theory and science, with the emphasis on theory testing;	Emphasizes primarily an inductive approach to the relationship between theory and science, with a focus on the generation of theories;
It integrated the natural science model's practices and norms, especially positivism and reality.	Rejected the natural scientific c model's practices and standards in general, as well as positivism in particular, in favour of a focus on how people view their social environment.
Embodies an external, objective perception of social reality	Embodies the idea of social existence as an ever-shifting emergent property of people's development.
Numerical data; How many people are affected by how many events?	Understanding of dynamic systems from a holistic perspective
Questionnaires are used in large-scale surveys.	Participant evaluation and informal interviews were used to create micro case studies.
At the start of the investigation, hypotheses and observable measures (variables) were determined.	Open ended and cumulative formulations of research and scope

Cross-Sectional Research

Cross sectional research is defined as an observational study where data is collected as a whole to study a population at a single point in time to examine the relationship between variables of interest.

1. In an observational study, a researcher records information about the participants without changing anything or manipulating the natural environment in which they exist.

2. The most important feature of a cross-sectional study is that it can compare different samples at one given point in time. For example, a researcher wants to understand the relationship between joggers and

level of cholesterol, he/she might want to choose two age groups of daily joggers, one group is below 30 but more than 20 and the other, above 30 but below 40 and compare these to cholesterol levels amongst non-joggers in the same age categories.

3. The researcher at this point in time can create subsets for gender, but cannot consider past cholesterol levels as this would be outside the given parameters for cross-sectional studies.

4. Cross-sectional studies allow the study of many variables at a given time. Researchers can look at age, gender, income etc in relation to jogging and cholesterol at a very little or no additional cost involved.

5. However, there is one downside to cross-sectional study, this type of study is not able to provide a definitive relation between cause-and-effect relation (a cause-and-effect relationship is one where one action (cause) makes another event happen (effect), for example, without an alarm, you might oversleep.)

6. This is majorly because cross-sectional study offers a snapshot of a single moment in time, this study doesn't consider what happens before or after. Therefore in this example stated above it is difficult to know if the daily joggers had low cholesterol levels before taking up jogging or if the activity helped them to reduce cholesterol levels that were previously high.

Longitudinal Research

Longitudinal study, like the cross-sectional study, is also an observational study, in which data is gathered from the same sample repeatedly over an extended period of time. Longitudinal study can last from a few years to even decades depending on what kind of information needs to be obtained.

1. The benefit of conducting longitudinal study is that researchers can make notes of the changes, make observations and detect any changes in the characteristics of their participants. One of the important aspects here is that longitudinal study extends beyond a single frame in time. As

a result, they can establish a proper sequence of the events that occurred.

2. Continuing with the example, in longitudinal study a researcher wishes to look at the changes in cholesterol level in women above the age of 30 but below 40 years who have jogged regularly over the last 10 years. In a longitudinal study setup, it would be possible to account for cholesterol levels at the start of the jogging regime, therefore longitudinal studies are more likely to suggest a cause-and-effect relationship.

3. Overall, research should drive the design, however, sometimes as the research progresses it helps determine which of the designs is more appropriate. Cross-sectional studies can be done more quickly as compared to longitudinal studies. That's why a researcher may start off with cross-sectional study and if needed follow it up with longitudinal studies.

Cross-sectional study	Longitudinal study
Cross-sectional studies are quick to conduct as compared to longitudinal studies.	Longitudinal studies may vary from a few years to even decades.
A cross-sectional study is conducted at a given point in time.	A longitudinal study requires a researcher to revisit participants of the study at proper intervals.
Cross-sectional study is conducted with different samples.	Longitudinal study is conducted with the same sample over the years.
Cross-sectional studies cannot pin down cause-and-effect relationship.	Longitudinal study can justify cause-and-effect relationship.
Multiple variables can be studied at a single point in time.	Only one variable is considered to conduct the study.
Cross-sectional study is comparatively cheaper.	Since the study goes on for years longitudinal study tends to get expensive.

Research Process

1.Formulation of research problem

You're ready to move on to the next phase in research study planning: clearly articulating the research issue, after you've chosen a particular research subject and conducted a comprehensive 49 literature review.

The research issue is usually expressed as a short question about the relationship between two or more variables.

Any question you want answered, as well as any theory or assertion you want to test or examine, can be turned into a research issue or a research subject for your study. It's important to note, though, that not all questions can be turned into research issues, and some might be incredibly difficult to investigate. Formulating a problem may seem simple to a beginner, but it requires extensive knowledge of both the subject area and research methodology. When you look at a topic more closely, you'll notice how difficult it is to turn an idea into a researchable issue.

The importance of formulating a research problem

The first and most significant step in the research process is to formulate a research problem. It's similar to deciding on a destination before embarking on a trip.

It is difficult to determine the shortest – or indeed any – path in the absence of a destination. A simple and cost-effective plan is also unlikely without a clear research issue.

A research issue is like the base of a house, to use another analogy. The foundation determines the form and style of the house. If the foundation is well-designed and solid, the building will be as well. A research study's foundation is the research dilemma, and if it's well-formulated, you can expect a successful study to follow.

- You must have a good understanding of what you want to learn about, rather than what you believe you must learn about. A research problem can take several different shapes, ranging from simple to complex.
- Almost every step that follows is determined by how a problem is phrased, including the type of study design that can be used, the sampling technique that can be used, the test instrument that can be used or created, and the type of analysis that can be done.
- Assume you want to do a research report on the resources available to depression patients who live in a community. If your goal is to learn about the different types of services available to patients with depression, your research would primarily be descriptive and qualitative.Qualitative analysis methodologies are used in these studies, which come under the category of qualitative research.

2.Literature review

- When you start a research project, one of the first things you can do is read the current literature to familiarise yourself with the body of information in your field of interest.
- Examining the literature can be time-consuming, intimidating, and frustrating, but it can also be satisfying.
- It aids you in establishing the theoretical foundations of your thesis, clarifying your ideas, and developing your research methodology in the early stages of your research. The literature review is used later in the process to strengthen and consolidate your own knowledge base and to help you integrate your results with the current body of knowledge. Since one of the most important responsibilities of science is to equate your results to those of others, the literature review is crucial.
- It assists you in integrating your results with established information during the writing of your study – that is, to either endorse or refute previous research. The higher your research's academic standard, the more important it is to integrate your results with established literature.

A literature review has the following functions:

❖ It gives you a theoretical foundation for your research.

❖ It assists you in establishing connections between what you want to study and what has already been studied.

❖ It allows you to demonstrate how your results have added to the body of information in your field.

❖ It aids in the integration of your research findings into the larger body of information.

Purpose of review

- To gain an understanding of the research topic's context.
- To classify the principles associated with it, as well as possible relationships between them, and to formulate testable hypotheses.
- To determine the most suitable approach, study design, methods of evaluating concepts, and analytic techniques.
- To locate data sets that have been used by other researchers.
- To see how other people structured their papers

3.The formulation of research objectives

Introduction

The research goals should be closely linked to the problem statement and should summarise what you plan to accomplish through the analysis. A research goal is a declarative, straightforward assertion that directs the investigation of the variables. The study's aim determines the research objectives. In general, research objectives concentrate on how to quantify factors, such as identifying or describing them. The aim of certain objectives is to determine the relationship or difference between two variables. Make sure that your goals are

within the range of outcomes that can be anticipated given the time, capital, and human resources.

Characteristics of research objectives

❖ A research goal is a specific assertion that describes what the study is attempting to accomplish. A well-worded objective will be SMART, i.e., Specific, Measurable, Attainable, Realistic, and Time-bound.

❖ Research objectives should be Relevant, Feasible, Logical, Observable, Unequivocal and Measurable.

❖ An objective is a goal that can be fairly accomplished in the time allotted and with the resources available.

4. formulation of hypothesis

theories based on available data and then make decisions based on the results. In social science, where direct knowledge of population parameter(s) is uncommon, hypothesis testing is a popular technique for determining whether sample data support a hypothesis sufficiently to allow generalisation. As a result of hypothesis testing, we can make probability claims about population parameters

What is the hypothesis?

The word hypothesis consists of two words- **Hypo+Thesis.**

 'Hypo' means tentative or subject to the verification. **'Thesis' means a statement about the solution of the problem**. Thus, the literal meaning of the term hypothesis is a tentative statement about the solution of the problem.

Hypothesis offers a solution to the problem that is to be verified empirically and based on some rationale. Again, 'hypo' means the composition of two or more variables which are to be verified and 'thesis' means position of these variables in the specific frame of reference.

When people speak about hypothesis, they usually mean a simple inference or a supposition that needs to be proven or disproved.

A hypothesis, on the other hand, is a formal the design of a hypothesis is an important factor in the formulation of a research problem in research. Hypotheses give a research issue clarity, specificity, and emphasis. In certain cases, the hypothesis is thought to be the most important tool in science.

The main purpose is to generate new ideas for experiments and observations. Indeed, several studies are conducted with the explicit goal of testing hypotheses. Decision-makers often encounter scenarios in which they want to test questions that a researcher wants to answer.

As a result, a hypothesis can be described as a proposition or a collection of propositions put forward as an explanation for the occurrence of a certain group of phenomena, either as a provisional speculation to direct some investigation or as a highly probable explanation in light of known facts.

A research hypothesis is frequently a predictive statement that connects an independent variable to a dependent variable and can be evaluated using scientific methods.

Types of Hypothesis

Hypotheses are classified in several ways. With reference to their function, hypotheses are of two types: **(a) Descriptive Hypothesis &(b) Relational Hypothesis**.

Another approach is to classify them into: **(c) Working Hypothesis, (d) Null Hypothesis and (e) Statistical Hypothesis**.

Third approach is to divide them on the basis of the level of abstraction. Three broad levels may be distinguished: **(i) simple description, (ii) logical derivation, and (iii) abstraction.**

Accordingly, there are three types of hypotheses: **(f) common-sense hypothesis, (g) complex hypothesis and (h)analytical hypothesis.**

➤ **Descriptive hypothesis:** These are propositions that describe the characteristics (such as size, form or distribution) of a variable. The variable may be an object, person, organisation, situation or event. Some examples are:

E.g., "The rate of unemployment among arts graduates is higher than that of commerce graduates."

➤ **Relational hypothesis**: These are propositions, which describe the relationship between two variables. The relationship suggested may be positive or negative correlation or causal relationship.

Some examples are:

"Families with higher incomes spend more for recreation."

"The lower the rate of job turnover in a work group, the higher the work productivity."

"Labour productivity decreases as working duration increases."

➤ **Causal hypothesis:** in terms of causal hypotheses, the presence of, or a change in, one variable cause or contributes to an effect on another variable. The independent variable is the first, and the dependent variable is the second. When dealing with causal relationships between variables, the researcher must consider which is the cause and which is the consequence.

➤ **Working hypothesis:** While planning the study of a problem, hypotheses are created. Initially they may not be very specific. They are referred to as "Working Hypotheses" in such situations, and they are subject to change as the investigation progresses.

➤ **Null hypothesis:**

- These are irrational claims that refute what working hypotheses specifically say.

- They don't exist in fact, and they never did. They say that there is no difference between the parameter and the statistic to which it is being compared. Even if there is a relationship between a family's income and recreational spending, a null hypothesis could state:

- "There is no relationship between families' income levels and recreational spending."

- Null hypothesis is used to assess statistical significance and they are a simple way to do statistical analysis.

- They're named that because the test will rule out the null hypotheses." Null hypotheses are formulated for testing statistical significance, since this form is a convenient approach to statistical analysis.

- As the test would nullify the null hypotheses, they are so called.The use of the null hypothesis has some justification.
- They have the characteristics of objectivity and detachment that a researcher should have. It seems that he is not acting critically while attempting to test a theory that he believes to be valid.
- When he uses the null hypothesis, this dilemma does not occur.
- Furthermore, null hypothesis are more precise.
- It's much easier to dismiss the opposite of a theory than it is to test it with absolute certainty. As a result, the principle of null hypothesis has proven to be extremely useful.
- Statements about a statistical population are known as statistical hypotheses. These are the results of a sample.

They are quantitative in nature so they can be measured numerically.

e.g., "Group A is older than Group B.

Statistical hypotheses may be either difference or association hypotheses, with the latter describing the relationships between variables. The coefficient of correlation is used to calculate this relationship; for example, if the coefficient of correlation between bonus and productivity is +1.0, then there is a perfect positive correlation between the two.

➢ **Common sense hypothesis**: These are the thoughts that are common sense. They say that empirical uniformities can be detected by day-to-day observations. Many empirical uniformities can be found in business establishments, worker social backgrounds, and complex group activity trends.

➢ **Complex hypothesis:** These are designed to see if there are any logically deduced associations between empirical uniformities. Human ecology, for example, defined empirical uniformities in the distribution of land values, industrial concentrations, business forms, and other phenomena in its early stages.

➢ **Analytical hypothesis-** This is about the relationship between analytic variables. These hypotheses can be found at the most abstract level of abstraction. These define the relationship between one property's change and another's change.

5.Research Design

The process of identifying the research problem is followed by the daunting task of preparing the research project plan, popularly known as the **"research design"**. A research design is a set of decisions on what, where, when, how much, and how an investigation or research analysis will be conducted. A research design is the set of conditions for data collection and interpretation that seeks to blend importance to the research intent with procedural economy. The strategy is the research's whole scheme or programme. It outlines what the investigator can do, from writing theories and their organisational consequences to data collection and interpretation.

Types of research design

Different research designs can be conveniently described if we categorise them
 (1) **Research design in case of exploratory research studies;**
 (2) **Research design in case of descriptive and**
     diagnostic research studies
 (3) **Longitudinal research design**

1.Exploratory Design

Formulative research trials are another name for exploratory research studies. The primary goal of these experiments is to formulate a topic for further study or to establish working theories from an organisational standpoint. The exploration of new concepts and perspectives is a significant focus of such research. As a result, the research design necessary for such experiments must be diverse enough to allow for consideration of various facets of the issue under investigation.

Since the research issue, which was initially specified narrowly, is transformed into one with a more specific definition in exploratory experiments, inbuilt versatility in research design is required. This fact can necessitate changes in the research method for obtaining relevant data. In general, the following three approaches are discussed in the light of study design for such studies:

(a) a review of relevant literature; (b) an experience survey; and (c) a review of 'insight stimulating' content

2.Descriptive and Diagnostic research Design

Diagnostic research studies assess the extent at which something happens or its interaction with something similar, while descriptive research studies are concerned with defining the traits of a specific person or community. Diagnostic testing trials are those that look at whether or not such factors are related.

Descriptive research studies, on the other hand, are concerned with precise forecasts, the narration of facts and characteristics concerning a person, a group, or a circumstance.

Descriptive and diagnostic tests have similar criteria in terms of study design, so these two categories of studies can be grouped together. In both descriptive and diagnostic tests, the researcher must be able to accurately describe what he needs to assess and find appropriate methods for doing so, as well as provide a good understanding of the "population" he wants to analyse. Since the aim of the studies is to collect complete and reliable data, the technique that will be used must be carefully prepared.

The research design must provide sufficient safeguards against bias and maximise reliability, while still taking into account the feasibility of the study's completion. In such studies, the architecture must be static, not fluid, and it must rely on the following:

(a) Formulating the objective of the study
(b) Designing the methods of data collection

(c) Selecting the sample

(d) Collecting the data 37

(e) Processing and analysing the data.

(f) Reporting the findings.

3.Longitudinal research design

The longitudinal design is a form of study design that is distinctive.

It is a comparatively little-used design in social science due to the time and expense involved, so it is not suggested to devote much room to it. It is generally an extension of survey study focused on a self-completion questionnaire or formal interview research within a cross-sectional design, as seen in social science subjects like sociology, social policy, and human geography. Longitudinal studies use ongoing or repetitive methods to track specific people over long stretches of time, many years or decades.

They're usually empirical in nature, including quantitative and/or qualitative evidence obtained on some mixture of exposures and effects, with no outside influences implemented.

This research style is especially useful for determining the association between risk factors and disease progression, as well as the patient outcomes over various time periods.

SAMPLE DESIGN

A sample design is a definite plan for obtaining a sample from a given population. It refers to the technique or the procedure the researcher would adopt in selecting items for the sample.

Steps in Sample Design:

• **Type of Universe**

• **Sampling Unit**

• **Sampling Frame**

• **Size of Sample**

• **Budgetary Constraints**

• Sampling Procedure

Characteristics Of a Good Sample Design

- Sample design must result in a truly representative sample
- Sample design must be such which results in a small sampling error
- Sample design must be viable in the context of funds available for the research study
- Sample design must be such so that systematic bias can be controlled in a better way
- Sample should be such that the results of the sample study can be applied, in general, for the universe with a reasonable level of confidence

Types of Sample Design

• Probability Sampling Design
Each element/respondent has a known probability of being included in the sample.

• Non-probability Sampling Design
Each element/respondent in the population is not given an equal chance of selection.

Data Collection:

Data represents information collected in the form of numbers and text. Data Collection is generally done after the experiment or observation. Primary data and Secondary data is helpful in planning and estimating. Data collection is either qualitative or quantitative.

Types of data collection methods are used in businesses and sales organisations to analyse the outcome of a problem, arrive at a solution, and understand a company's performance. Furthermore, there are two

types of data collection methods namely, Primary data collection methods, and secondary data collection methods. In this article, we will provide you with collection of data in statistics, source of data collection and data collection in research methodology.

Data and Types of Data

Collecting the information from the numerical fact after observation is known as raw data. There are two types of data. Below we have provided the types of data: Primary Data and Secondary Data.

Primary Data and Secondary Data

1. Primary Data

When an investigator collects data himself with a definite plan or design in his/her way, then the data is known as primary data. Generally, the results derived from the primary data are accurate as the researcher gathers the information. But, one of the disadvantages of primary data collection is the expenses associated with it. Primary data research is very time-consuming and expensive.

2. Secondary Data

Data that the investigator does not initially collect but instead obtains from published or unpublished sources are secondary data. Secondary data is collected by an individual or an institution for some purpose and are used by someone else in another context. It is worth noting that although secondary data is cheaper to obtain, it raises concerns about accuracy. As the data is second-hand, one cannot fully rely on the information to be authentic.

Data collection is defined as collecting and analysing data to validate and research using some techniques. It is done to diagnose a problem and learn its outcome and future trends. When there is a need to solve a question, data collection methods help assume the future result.

We must collect reliable data from the correct sources to make the calculations and analysis easier. There are two types of data collection methods. This is dependent on the kind of data that is being collected. They are:

- **Primary Data Collection Methods**
- **Secondary Data Collection Methods**
- **Data Collection Method**

Tools of Data Collection

A researcher requires a lot of data – gathering tools or techniques. Tests are the tools of measurement and it guides the researcher in data collection and also in evaluation. Tools may vary in complexity, interpretation, design and administration. Each tool is suitable for the collection of certain types of information.
One has to select from the available tools those which will provide data he seeks for testing hypothesis. It may happen that existing research tools do not suit the purpose in some situation, so researcher should modify them or construct his own.
Different tools used for data collection may be;

1. Questionnaires

2. Interviews

3. Schedules

4. Observation Techniques

5. Rating Scales

1. Questionnaire:

It is a list of questions related to one topic.

It may be defined as; **"A questionnaire is a systematic compilation of questions that are submitted to a sampling of the population from which information is desired.**

- In general, the word questionnaire refers to a device for securing answers to questions by using a form which the respondent fills in himself.
- The questionnaire is probably the most used and most abused of the data gathering devices .It is easy to prepare and to administer.
- The questionnaire is a form prepared and distributed to secure responses to certain questions.
- It is a device for securing answers to questions by using a form which the respondent will fill by himself.
- It is a systematic compilation of questions.
- It is an important instrument being used to gather information from widely scattered sources.
- Normally used where one cannot see personally all of the people from whom he desires responses or where there is no particular reason to see them personally.

Characteristics of a Good Questionnaire:

1. It deals with an important or significant topic.

2. Its significance is carefully stated on the questionnaire itself or on its covering letter**.**

3. It seeks only that data which cannot be obtained from the resources like books, reports and records.

4. It is as short as possible, only long enough to get the essential data.

5. It is attractive in appearance, nearly arranged and clearly duplicated or printed.

6. Directions are clear and complete, important terms are clarified.

7. The questions are objective, with no clues, hints or suggestions.

8. Questions are presented in an order from simple to complex.

9. Double negatives, adverbs and descriptive adjectives are avoided.

10. Double barrelled questions or putting two questions in one question are also avoided.

11.The questions carry an adequate number of alternatives.

12. It is easy to tabulate, summarise and interpret.

2. Interview:

Interview is a twoway method which permits an exchange of ideas and information.

"Interviewing is fundamentally a process of social interaction."

Not only is physical distance between them annihilated, the social and cultural barrier is also removed; and a free mutual flow of ideas to and fro takes place.

Both create their respective impressions upon each other.

The interview brings them both on the same level and an emotional attachment supervenes between them.

In an interview all formalities are laid down and the gate is opened for delivering into the intellectuals, emotional and subconscious stirrings of the interviewee.

Thus, here the 'depth' of the subject (man) is gone to the very bottom of his emotional pool and may check his truthfulness of responses.

Characteristics of an Interview:

1. The interviewer can probe into causal factors, determine attitudes, and discover the origin of the problem.

2. It's appropriate to deal with young children and illiterate people.

3. It can make cross questioning possible.

4. It helps the investigator to gain an impression of the person concerned.

5. It can deal with delicate, confidential and even intimate topics.

6. It has flexibility.

7. Sincerity, frankness, truthfulness and insight of the interviewee can be better judged through cross questioning.

8. It gives no chance for the respondent to modify his earlier answer.

9. It is applicable in survey methods, but it is also applicable in historical, experimental, case studies and clinical studies.

3.Schedule:

"Schedule is the name usually applied to a set of questions, which are asked and filled by an interviewer in a face to face situation with another."

"The schedule is nothing more than a list of questions which it seems necessary to test the hypothesis."

Thus schedule is a list of questions formulated and presented with the specific purpose of testing an assumption or hypothesis.

In the schedule method, interviews occupy a central role and play a vital role. As a matter of fact success in the use of schedule is largely determined by the ability and tact of the interviewer rather than by the quality of the questions posed.

Because the interviewer himself poses the questions and notes down the answers all by himself, the quality of questions has not any great significance.

Important Features of Schedule:

1. The schedule is presented by the interviewer. The questions are asked and the answers are noted down by him.

2. The list of questions is a mere formal document, it need not be attractive.

3. The schedule can be used in a very narrow sphere of social research. 4. It aids to delimit the scope of the study and to concentrate on the circumscribed elements essential to the analysis.

5. It aims at delimiting the subject.

6. In the schedule the list of questions is pre planned and noted down formally and the interviewer is always armed with the formal document detailing the questions. Thus the interviewer does not depend upon the memory.

4.Observation Technique:

This is the most commonly used technique of evaluation research. It is used for evaluating cognitive and non-cognitive aspects of a person.

It is used in evaluation performance, interests, attitudes, values towards their life problems and situations.

It is the most useful technique for evaluating the behaviours of children. 64

It is a technique of evaluation in which behaviour are observed in natural situations.

"It is a thorough study based on visual observation. Under this technique group behaviours and social institutions problems are evaluated." C. Y. Young "Observation employs relatively more visual and senses than audio and vocal organs.

"Observation is recognized as the most direct means of studying people when one is interested in their overt behaviour. In questionnaires and interviews people may write answers as they think they do but this is often different from what they actually do.

These restrictions are missing in observation so observation is a more natural way of gathering data.

Artificiality and formality of questionnaires and interviews is replaced by reality and informality in observation.

Data obtained through observation are more real and true than the data collected by any other method.

It also plays a particular part in survey procedure.

Characteristics of Observation Schedule:

According to Jahoda it has many characteristics;

- It serves a formulated research purpose.
- It is planned systematically rather than occurring haphazardly.
- It is systematically recorded and related to more general propositions.
- It is subjected to checks and controls with respect to validity , reliability and precision.
- It is a direct technique to study an object, an event or a problem.
- It is based mainly on visual –audio scene

- It employs its own experiences.
- It establishes a cause-effect relationship.
- It is an objective technique of data collection.
- It is both an objective and subjective evaluation technique.
- It is a formal as well as informal technique.
- It is a quantitative as well as qualitative technique for data collection.

5.Rating Scale:

Ratting is a term applied to express opinion or judgement regarding some situation, object or character. Opinions are usually expressed on a scale of values; rating techniques are devices by which such judgments may be quantified. "Rating is an essence and direct observation."

Ruth Strong "**A rating scale ascertains the degree, intensity and frequency of a variable."**

Von Dallen Rating techniques are more commonly used in scaling traits and attributes.

A rating method is a method by which one systematised the expression of opinion concerning a trait. The rating is done by parents, teachers, a board of interviewers and judges and even by the self as well.

The special feature of rating scale is that the attitudes are evaluated not on the basis of the opinions of the subjects but on the basis of the opinions and judgments of the experimenter himself.

In rating scale data are collected by; Verbal behaviour, facial expression, personal documents, clinical type interview, projective techniques and immediate experiences as emotions, thoughts and perceptions.

Advantages:

1. Writing reports to parents.
2. Filling out admission blanks for colleges.
3. Finding out students' needs.
4. Making recommendations to employers.
5. Supplement other sources of undertaking about children.

6. Stimulating effect upon the rates.

Doing a Pilot Study:

Why is it Essential?

- Conducting a pilot study is important in social research. It serves many purposes:
- It often provides the researcher with ideas, approaches, clues the researcher may not have foreseen before conducting the study. Such ideas and clues increase the chances of getting clearer findings in the main study.
- It permits a thorough check of the planned statistical and analytical procedures, giving the researcher a chance to evaluate their usefulness to the data. The researcher may then be able to make needed alterations in the data collecting methods and therefore analyse data in the main study more efficiently.
- It can greatly reduce the number of unanticipated problems because the researcher has all opportunity to redesign parts of his/her study to overcome difficulties that the pilot study reveals.
- It may save a lot of time and money. The pilot study almost always provides enough data for the researcher to decide whether to go ahead with the main study.
- In the pilot study, the researcher may try out a number of alternative measures and then select those that produce the clearest result for the main study.

Pre-test
- The objective of this section is to understand the importance of pre-testing.

- Pre-test is an important part of social research.
- Despite their widely recognized importance in survey research, pre-tests have received little methodological attention .
- Whether a study is to employ questionnaires, interviews, observation or available data, a pretest is vital.
- As has been mentioned
- Earlier, pre-tests are preliminary tests of the measures used on a small sample of the population to be studied.
- No matter how carefully one designs a measure for questionnaire, interviews, or observations it is still advisable to give it an actual try. A **pre-test** of a questionnaire may demonstrate that some of the questions are unintelligible to respondents.
- In a questionnaire with open–ended questions, the researcher might find that the respondents are giving inadequate answers, suggesting a need to reword the question.

An interviewer undertaking a pre-test might find that the respondents do not feel that that the interview is legitimate and may refuse to be questioned, signalling the need to reword the introductory remarks. Very often pretesting of questionnaires is done in a hurried, non-systematic fashion.

Data Processing

Data processing in research is the collection and translation of a data set into valuable, usable information. Through this process, a researcher, data engineer or data scientist takes raw data and converts it into a more readable format, such as a graph, report or chart, either manually or through an automated tool. The researcher will then use this information to gain insights, solve problems, make improvements and ultimately generate better results.

The data processing cycle includes several steps. Though each stage has a specific order, the entire process repeats cyclically.

1. Collection

Data collection is the process of extracting data from available sources, such as data warehouses and data lakes. Raw data can come in several forms, from user behaviour to monetary figures to profit statements to web cookies.

The type of raw data that you collect will have a significant impact on the output you later produce. Researchers must look to accurate, trustworthy and comprehensive sources for valid, usable findings.

2. Preparation

Through data preparation, you will polish, organise, filter and examine raw data for errors. The data preparation stage is meant to eliminate incorrect, redundant or incomplete data and convert it into a suitable form for further processing and analysis. The goal of the preparation stage is to achieve the highest quality data possible.

3. Input

The input stage is the first stage where raw data begins to resemble usable information. Once the data is clean, you'll enter it into a corresponding destination, such as a data warehouse or customer relationship management (CRM) software, and translate it into a compatible language for these systems. You can enter this data using numerous input sources, including keyboards, scanners or digitizers.

4. Processing

Next, you'll begin to process the data stored in your computer during the data input stage. You can conduct data processing using machine learning and artificial intelligence algorithms to generate the desired input, but the processing will vary based on your data sources and intended output use. You can use the data from the processing stage in a variety of ways, from creating medical diagnoses to determining customer needs to drawing connections between advertising patterns.

5. Output

Through this stage, data becomes usable and can be interpreted by non-data scientists. This translated data is readable and often presented in images, graphs, text, audio and videos. Once interpreted, company members can self-serve the data for their analytics projects.

6. Storage

After processing the data successfully, all remaining information should be stored for later use. When companies properly store their data, they remain compliant with data protection legislation and promote a faster, easier means of accessing information when they need to. They can also use this data as input in the following processing cycle.

What Are the Three Methods of Data Processing?

You can choose from three primary methods of data processing based on your needs:

Manual data processing: Through this method, users process data manually, meaning they carry out every step without using electronics or automation software. Though this method is the least

expensive and requires minimal resources, it can be time-consuming and has a higher risk of producing errors.

Mechanical data processing: Mechanical processing involves the use of machines and devices to filter data, such as calculators, printing presses or typewriters. This method is suitable for simple data processing endeavours and produces fewer errors but is more complex than other techniques.

Electronic data processing: Researchers process data using modern data processing software and technologies, where they feed an instruction set to the program to analyse the data and create a yield output. Though this method is the most expensive, it is also the fastest and most reliable for generating accurate output.

Data analysis

Data analysis embraces a whole range of activities of both the qualitative and quantitative type. It is usual tendency in behavioural research that much use of quantitative analysis is made and statistical
methods and techniques are employed. The statistical methods and techniques are employed. The statistical methods and techniques have got a special position in research because they provide answers to the problems.

Kaul defines data analysis as," Studying **the organised material in order to discover inherent facts. The data are studied from as many angles as possible to explore the new facts."**

Purpose:

The following are the main purposes of data analysis:

(i) Description:

It involves a set of activities that are as essential first step in the development of most fields. A researcher must be able to identify a topic about which much was not known; he must be able to convince
others about its importance and must be able to collect data.

(ii) Construction of Measurement Scale:

The researcher should construct a measurement scale. All numbers generated by measuring instruments can be placed into one of four categories:

(a) Nominal: The number serves as nothing more than labels. For example no 1 was not less than no 2 .Similarly no 2 was neither more than no 1 and nor less than no 3.

(b) Ordinal: Such numbers are used to designate an ordering along some dimensions such as from less to more, from small to large, from sooner to later.

(c) Interval: The interval provides more précised information than ordinal one. By this type of measurement, the researcher can make exact and meaningful decisions. For example if A, B and C are of 150 cm, 145 cm and 140 cm height, the researcher can say that A is 5 cm taller than B and B is 5 cm taller than C.

(d) Ratio Scale: It has two unique characteristics. The intervals between points can be demonstrated to be precisely the same and the scale has a conceptually meaningful zero point.

Report writing

A detailed account of the research experience from selection and definition of the problem, formulation of hypotheses, gathering, analysing and interpreting data, testing of hypotheses, making conclusion and suggesting further research in the related problem area is called a research report.

Components:

The basic components of a research report are as follows;

(i) Introduction of the research problem:

The researcher will write in it;

a) What is the problem?

b) What is its importance?

c) What is the relation of the problem with previous theory and research,

d) What are the objectives of the study?

e) What are the hypotheses?

(ii) Description of the procedure of the research:

The researcher will write in it;

a) How did he select the subjects?

b) How many subjects were used?

c) How were the subjects assigned to groups?

d) What was done to the subjects?

e) How was it done?

f) When was it done?

g) How long was it done?

h) How was the reliability of the measuring instruments measured?

i) How was the validity of the measuring instruments measured?

(III) Description and presentation of the results:

The researcher will write in it;

a) Which statistical procedures he used to test the hypotheses?

b) What were the outcomes of those procedures?

c) What were the subsidiary findings of the research?

(IV) Discussion of the study findings:

The researcher will write in it;

a) Why did the results manifest themselves in a particular way?

b) What did their results signify?

c) What was the relationship between this research and the previous research upon which it was based?

Features:

The following are the essential features of a good research report;

(i) Clarity

(ii) Conciseness

(iii) Veracity

(iv) No place for figures of speech, lyrical prose and in using anecdotes.

(v) No lengthy digressions

(vi) Only necessary details

(vii) Absolute uncompromising honesty

(viii) Serious attempt and not a game

Quantitative Research Methods

Quantitative research deals with objective measurements and includes statistical or numerical analysis of data collected through polls, questionnaires or surveys. The variables can be manipulated as well as controlled in quantitative research.Basically, the variables are manipulated to examine the cause- effect relationship,carry out comparative analysis or interventional analysis within a specified population.

Quantitative research deals with numbers. It focuses more on convergent reasoning than on divergent reasoning which means that the researcher tries to find out solutions to a research problem with the help of standardised tools and not by creative ideas. It mainly focuses on quantifying relationships between variables.

Characteristics of Quantitative method

The characteristics of quantitative research are as follows:

1) **Clearly defined research questions**: Based on the research problem, the researcher frames clearly defined research questions and the answers to these questions are sought objectively.

2) **Representative sample**: The researcher selects a sample from a specified population from which data is aimed to be collected. These samples are representative of the population, so that the results achieved can be generalised to the population.

3) **Manipulation/ control of variables:** As mentioned before, quantitative research deals with variables and as per the requirement, the researcher manipulates (for example, increases or decreases) and even controls the extraneous/controlled variables that can affect the research study.

4) **Structured and standardised tools used for data collection:** Quantitative research deals with numbers and the data is collected with the help of structured or standardised research instruments. The data is analysed with the help of empirical evidence. The data are collected in the form of numbers, and statistics, often arranged in tables, charts, figures, or other non-textual forms.

5) **It is reliable and valid**: Since the study is done under controlled observations involving scientific investigations, they can be replicated or repeated and provide similar results. The quantitative research is high on reliability.Further, as quantitative research involves the use of standard and structured instruments (which are variable specific), they are valid as well.

6) **Generalisability:** Since the quantitative research is done in a well-planned manner and are highly reliable as well as valid, the results obtained through the method can be generalised and can also be used to effectively predict results and infer causal relationships.

Techniques and Types of Studies

There are multiple types of primary quantitative research. They can be distinguished into the four following distinctive methods, which are:

Survey Research:

Survey Research is the most fundamental tool for all quantitative outcome research methodologies and studies. Surveys used to ask questions to a sample of respondents, using various types such as online polls, online surveys, paper questionnaires, web-intercept surveys, etc. Every small and big organisation intends to understand what their customers think about their products and services, how well are new features faring in the market and other such details.

By conducting survey research, an organisation can ask multiple survey questions, collect data from a pool of customers, and analyse this collected data to produce numerical results. It is the first step towards collecting data for any research.

This type of research can be conducted with a specific target audience group and also can be conducted across multiple groups along with comparative analysis. A prerequisite for this type of research is that the sample of respondents must have randomly selected members. This way, a researcher can easily maintain the accuracy of the obtained results as a huge variety of respondents will be addressed using random selection. Traditionally, survey research was conducted face-to-face or via phone calls but with the progress made by online mediums such as email or social media, survey research has spread to online mediums as well.

Traditionally, survey research was conducted face-to-face or via phone calls but with the progress made by online mediums such as email or social media, survey research has spread to online mediums as well.

There are two types of surveys, either of which can be chosen based on the time in-hand and the kind of data required:

A. Cross-sectional surveys: Cross-sectional surveys are observational surveys conducted in situations where the researcher intends to collect data from a sample of the target population at a given point in time. Researchers can evaluate various variables at a particular time. Data gathered using this type of survey is from people who depict similarity in all variables except the variables which are considered for research. Throughout the survey, this one variable will stay constant.

Cross-sectional surveys are popular with retail, SMEs, healthcare industries. Information is garnered without modifying any parameters in the variable ecosystem.
Using a cross-sectional survey research method, multiple samples can be analysed and compared.
Multiple variables can be evaluated using this type of survey research.
The only disadvantage of cross-sectional surveys is that the cause-effect relationship of variables cannot be established as it usually evaluates variables at a particular time and not across a continuous time frame.
B. Longitudinal surveys:

 Longitudinal surveys are also observational surveys but, unlike cross-sectional surveys, longitudinal surveys are conducted across various time durations to observe a change in respondent behaviour and thought-processes. This time can be days, months, years, or even decades. For instance, a researcher planning to analyse the change in buying habits of teenagers over 5 years will conduct longitudinal surveys.

In cross-sectional surveys, the same variables were evaluated at a given point in time, and in longitudinal surveys, different variables can be analysed at different intervals of time.

Longitudinal surveys are extensively used in the field of medicine and applied sciences. Apart from these two fields, they are also used to observe a change in the market trend, analyse customer satisfaction, or gain feedback on products/services.

In situations where the sequence of events is highly essential, longitudinal surveys are used.

Researchers say that when there are research subjects that need to be thoroughly inspected before concluding, they rely on longitudinal surveys.

Interview schedule

An interview schedule is basically a list containing a set of structured questions that have been prepared, to serve as a guide for interviewers, researchers and investigators in collecting information or data about a specific topic or issue. The schedule will be used by the interviewer, who will fill in the questions with the answers received during the actual interview.

Advantages of an Interview Schedule

An interview schedule facilitates the conduct of an interview. Since the questions have already been prepared beforehand, it is easier to carry out and complete the interview.

It increases the likelihood of collecting accurate information or data. The questions, which were already prepared beforehand, are expected to be well-thought out and have focus, so they target the "heart of the matter", thereby ensuring that the answers obtained are correct or accurate. Thus, the information gathered is more relevant and useful. The rate and amount of responses are higher. Often, interviews are time-bound.

Interviewers are given only a limited amount of time to ask all their questions and get the answers. If he comes prepared, then he can utilise that time properly.

Otherwise, he will be wasting a lot of time, thinking about what question to ask next.

The next thing he knows, time is up, and he barely got anything substantial from the interviewee.

It offers flexibility and high customization, and may be used when interviewing different types of people. The interviewer can prepare it with the respondents in mind. For example, an interviewer may have prepared a job interview schedule for the recruitment of a construction worker or labourer. When he is tasked to interview candidates for a senior management position, he may also use the same schedule,but with several adjustments.

Disadvantages of an Interview Schedule

- **It can be time-consuming.** Preparation of the interview schedule can take quite a chunk of the time of an interviewer, especially if it is for an extensive or in-depth interview.

- Significant amounts of research must be performed in order to be able to craft good questions.
- **There is a high risk that the interview** and its results may suffer from the bias of the interviewer, as he is the one that will choose the questions to be asked during the interview.
- **Variability may be high** when the interview schedule is used by multiple interviewers. This may result in unreliable information gathered during the interviews.

Questionnaire

A questionnaire is a research instrument that consists of a set of questions or other types of prompts that aims to collect information from a respondent. A research questionnaire is typically a mix of close-ended questions and open-ended questions.

Open-ended, long-form questions offer the respondent the ability to elaborate on their thoughts. Research questionnaires were developed in 1838 by the Statistical Society of London.

The data collected from a data collection questionnaire can be both qualitative as well as quantitative in nature. A questionnaire may or may not be delivered in the form of a survey, but a survey always consists of a questionnaire.

Advantages of a good questionnaire design

- With a survey questionnaire, you can gather a lot of data in less time.

- There is less chance of any bias creeping if you have a standard set of questions to be used for your target audience.
- You can apply logic to questions based on the respondents' answers, but the questionnaire will remain standard for a group of respondents that fall in the same segment.
- Surveying online survey software is quick and cost-effective. It offers you a rich set of features to design, distribute, and analyse the response data.
- It can be customised to reflect your brand voice. Thus, it can be used to reinforce your brand image.
- The responses can be compared with the historical data and understand the shift in respondents' choices and experiences. Respondents can answer the questionnaire without revealing their identity.
- Also, many survey software complies with significant data security and privacy regulations.

Characteristics of a good questionnaire

Uniformity: Questionnaires are very useful to collect demographic information, personal opinions, facts, or attitudes from respondents. One of the most significant attributes of a research form is uniform design and standardisation. Every respondent sees the same questions. This helps in data collection and statistical analysis of this data.

Exploratory: It should be exploratory to collect qualitative data. There is no restriction on questions that can be in your questionnaire. For

example, you use a data collection questionnaire and send it to the female of the household to understand her spending and saving habits relative to the household income. Open-ended questions give you more insight and allow the respondents to explain their practices. A very structured question list could limit the data collection.

Question Sequence: It typically follows a structured flow of questions to increase the number of responses. This sequence of questions is screening questions, warm-up questions, transition questions, skip questions, challenging questions, and classification questions.

Sampling

Sampling is a technique of selecting individual members or a subset of the population to make statistical inferences from them and estimate characteristics of the whole population. Different sampling methods are widely used by researchers in market research so that they do not need to research the entire population to collect actionable insights.

It is also a time-convenient and a cost-effective method and hence forms the basis of any research design. Sampling techniques can be used in a research survey software for optimum derivation.

Types of sampling: sampling methods

Sampling in market research is of two types – **probability sampling and non-probability sampling.**

1.Probability sampling:

Probability sampling is a sampling technique where a researcher sets a selection of a few criteria and chooses members of a

population randomly. All the members have an equal opportunity to be a part of the sample with this selection parameter.

There are four types of probability sampling techniques:

1.Simple random sampling:
One of the best probability sampling techniques that helps in saving time and resources, is the Simple Random Sampling method. It is a reliable method of obtaining information where every single member of a population is chosen randomly, merely by chance. Each individual has the same probability of being chosen to be a part of a sample.

2.Cluster sampling: Cluster sampling is a method where the researchers divide the entire population into sections or clusters that represent a population. Clusters are identified and included in a sample based on demographic parameters like age, sex, location, etc. This makes it very simple for a survey creator to derive effective inference from the feedback.

3.Systematic sampling:
Researchers use the systematic sampling method to choose the sample members of a population at regular intervals. It requires the selection of a starting point for the sample and sample size that can be repeated at regular intervals. This type of sampling method has a predefined range, and hence this sampling technique is the least time-consuming.

4.Stratified random sampling:
Stratified random sampling is a method in which the researcher divides the population into smaller groups that don't overlap but represent the entire population. While sampling, these groups can be organised and then draw a sample from each group separately.

2.Non-probability sampling:

The non-probability method is a sampling method that involves a collection of feedback based on a researcher or statistician's sample selection capabilities and not on a fixed selection process. In most situations, the output of a survey conducted with a non-probable sample leads to skewed results, which may not represent the desired target population. But there are situations such as the preliminary stages of research or cost constraints for conducting research, where non-probability sampling will be much more useful than the other type.

Four types of non-probability sampling explain the purpose of this sampling method in a better manner:

1.Convenience sampling: This method is dependent on the ease of access to subjects such as surveying customers at a mall or passers-by on a busy street. It is usually termed as convenience sampling, because of the researcher's ease of carrying it out and getting in touch with the subjects. Researchers have nearly no authority to select the sample elements, and it's purely done based on proximity and not representativeness.
This non-probability sampling method is used when there are time and cost limitations in collecting feedback. In situations where there are resource limitations such as the initial stages of research, convenience sampling is used.

2.Judgmental or purposive sampling: Judgemental or purposive samples are formed by the discretion of the researcher. Researchers

purely consider the purpose of the study, along with the understanding of the target audience.

3.Snowball sampling: Snowball sampling is a sampling method that researchers apply when the subjects are difficult to trace. For example, it will be extremely challenging to survey shelterless people or illegal immigrants. In such cases, using the snowball theory, researchers can track a few categories to interview and derive results. Researchers also implement this sampling method in situations where the topic is highly sensitive and not openly discussed

4.Quota sampling: In Quota sampling, the selection of members in this sampling technique happens based on a pre-set standard. In this case, as a sample is formed based on specific attributes, the created sample will have the same qualities found in the total population. It is a rapid method of collecting samples.

scaling techniques

Scaling technique is a method of placing respondents in continuation of gradual change in the pre-assigned values, symbols or numbers based on the features of a particular object as per the defined rules. All the scaling techniques are based on four pillars, i.e., **order, description, distance and origin.**
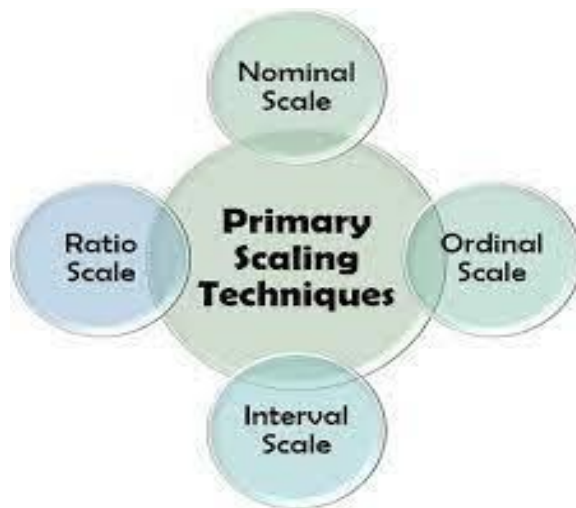
Types of Scaling Techniques

The researchers have identified many scaling techniques; today, we will discuss some of the most common scales used by business organisations, researchers, economists, experts, etc.

These techniques can be classified as **primary scaling techniques and other scaling techniques.**

Primary Scaling Techniques

The major four scales used in statistics for market research consist of the following:

Nominal Scale

Nominal scales are adopted for non-quantitative labelling variables which are unique and different from one another.

Types of Nominal Scales:

- **Dichotomous:** A nominal scale that has only two labels is called 'dichotomous'; for example, Yes/No.
- **Nominal with Order:** The labels on a nominal scale arranged in an ascending or descending order is termed as 'nominal with order'; for example, Excellent, Good, Average, Poor, Worst.
- **Nominal without Order**: Such nominal scale which has no sequence, is called 'nominal without order'; for example, Black, White.

Ordinal Scale

The ordinal scale functions on the concept of the relative position of the objects or labels based on the individual's choice or preference.

For example, At Amazon.in, every product has a customer review section where the buyers rate the listed product according to their buying experience, product features, quality, usage, etc.
The ratings so provided are as follows:

5 Star – Excellent

4 Star – Good

3 Star – Average

2 Star – Poor

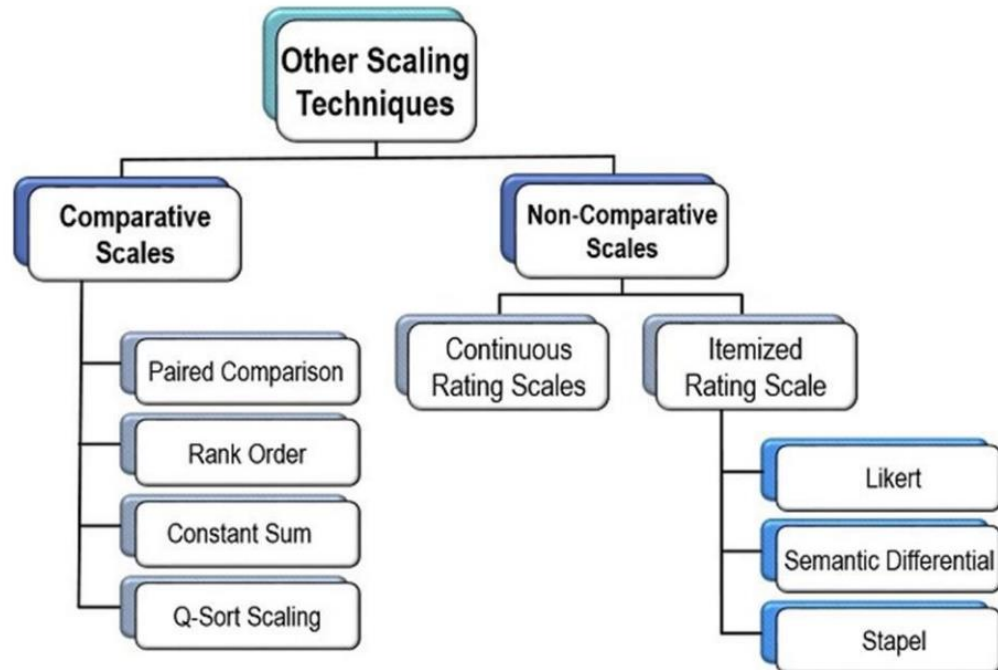**1 Star – Worst**

Interval Scale

An interval scale is also called a cardinal scale which is the numerical labelling with the same difference among the consecutive measurement units. With the help of this scaling technique, researchers can obtain a better comparison between the objects.

Ratio Scale

One of the most superior measurement techniques is the ratio scale. Similar to an interval scale, a ratio scale is an abstract number system. It allows measurement at proper intervals, order, categorization and distance, with an added property of originating from a fixed zero point. Here, the comparison can be made in terms of the acquired ratio.

Other Scaling Techniques

Scaling of objects can be used for a comparative study between more than one object (products, services, brands, events, etc.). Or can be individually carried out to understand the consumer's behaviour and response towards a particular object

Likert scale

Likert scales are one of the most commonly used scales in social science research. They offer a simple rating system that is common to surveys of all kinds. The scale is named for the psychologist who created it, Rensis Likert. One common use of the Likert scale is a survey that asks respondents to offer their opinion on something by stating the level to which they agree or disagree. It often looks like this:

- ➢ **Strongly agree**
- ➢ **Agree**
- ➢ **Neither agree nor disagree**
- ➢ **Disagree**

➢ **Strongly disagree**

Within the scale, the individual items that compose it are called Likert items. To create the scale, each answer choice is assigned a score (for instance, 0-4), and the answers for several Likert items (that measure the same concept) can be added together for each individual to obtain an overall Likert score.

For example, let's say that we're interested in measuring prejudice against women. One method would be to create a series of statements reflecting prejudiced ideas, each with the Likert response categories listed above. For example, some of the statements might be,

The summative models assume that the individual items in the scale are monotonically related to the underlying attributes and a summation of the item scoresis related linearly to the attitude. In a summative model, one obtains the total score by adding scores on individual items. For the statements that imply negative attitudes, the scoring is reversed. The scales allow an expression of the intensity of feeling.

These scales are also called Likert scales. Here, instead of having just "agree" and" disagree" in the scale, we can have intensities varying from "strongly agree" to "strongly disagree".

The scale construction consists of the following steps:

- Write a large number of statements that-concern the particular attitudinal object being investigated. For instance, one may be looking at the role of voluntary agencies in providing health services. in rural areas. Most of these statements should either be moderately positive or moderately negative. Neutral items are generally avoided in these scales. The items should be evenly divided between positive and negative statements.

- Administer the pool of statements on a group of respondents who are similar to the population on whom the scale will be used. For example, if we want to study the attitude of housewives the pool should be administered on a group of housewives with similar backgrounds to our final population.

- Assign scale values to the degrees of agreement or disagreement with each item. The particular values may differ from one researcher to another. Sometimes one may adopt the values 1, 2, 3, 4, 5 and sometimes +2, +1, 0, -1, -2. For negative items the directions should be reversed.

- Calculate a total attitude score for each respondent using the same scaling procedure. The distribution of total scores is then used to refine the list of items. This step is called item analysis.

- **Item analysis:** Analyse the responses and select for the scale those items which most clearly differentiate between the highest and lowest scores. This can be done by dividing the respondents into the high and the low scoring categories. The high scorers can be assumed to be with favourable attitudes and the low scorers can be taken as having the least favourable attitudes.

- Attitude Measurement and quartiles and compute the median score for each item for the highest twenty-five per cent States and the lowest twenty-five percent of scale scores.

- The statements remaining in the pruned fast are randomly_ ordered on the scale form. The positive and negative ones are mixed.

- The scale is now administered on the respondents who are asked to indicate their degree of agreement with the items. A respondent's total score is generated as the sum of his scores on each statement.

Qualitative Research Methods

Qualitative research can be defined as a type of scientific research that tries to bridge the gap of incomplete information, systematically collect evidence, produce findings and thereby seek answers to a problem or question**.**

Characteristics of Qualitative Research

The following are the characteristics of qualitative research:

1) Data leads to formation of theory: In a qualitative research, the researcher collects data by going to the participants, interacting with them and interviewing them at an in-depth level. The data therefore collected is rich in information and becomes a basis for the formation of theories. It can be said that qualitative research has a primacy of data.

2) Context bound research: The qualitative research involves specific studies with reference to context, culture or society. Therefore, the research is more context sensitive. The researchers study the events or day to day life actions on a daily basis and they need to take into account all the happenings taking place in the particular situation. They have to exclude their personal biases and deeply involve themselves as participants of the event or situation. Thus, qualitative research is context specific.

3) Involvement or immersion of researchers: As mentioned earlier, qualitative research leads to complete involvement of the researchers in the natural settings. They need to engage actively in the activities to understand the phenomena or processes. Even before the process of data collection, they need to become familiar with the culture/ society/ situation which they are going to study. They should not be influenced by their perceptions, biases and thoughts and need to involve deeply into the research settings. Thus, the researchers deeply immerse themselves in the cultural settings in the qualitative method of research.

4) Researcher participant relationship:

The researcher in a qualitative research needs to be non judgemental and he/ she should not make any presumptions, since they need to collect the original responses from the participants. The relationship between the researcher and participants of the research should lead to gain of relevant information which is free from biases.

5) Thick description: immersion of the researchers in the (research) setting will help the researchers to use thick descriptions. Since the data collected from the participants involve the responses, experiences, interpretations, phenomena and rituals they follow; the description of the events, processes, phenomena etc., the interview and discussion with the participants should be thoroughly mentioned by the researcher. The thick description includes the information about facts, and theoretical as well as analytical description. Thus, qualitative research involves thick description, which includes the clear description of the culture, context, process and steps of research which helps in construction of reality and analysis of research.

6) Data collection and data analysis occur simultaneously: The researcher immerses himself in the research settings to collect data through various ways like observation and interview and he/she keeps on analysing and interpreting the data simultaneously.

Types of observation

1.Participant Observation:

The participant observation means watching the events or situation or activities from inside by taking part in the group to be observed. He freely interacts with the other group members, participates in

various activities of the group, acquires the way of life of the observed group or his own, and studies their behaviour or other activities not as an outsider but by becoming a member of that group.

Goode and Hatt define participant observation as "**the procedure used when the investigator can disguise himself as to be accepted as a member of the group". So in this kind of observation the observer has to stay as a member in the group he wants to study.**

Advantages of Participant Observation
Observation in natural setting:
The chief advantage of participant observation is that it enables the researcher to study the respondents in their natural habitat or setting. It means that the respondents do not come to the researcher's office to give an interview or information; rather it is the researcher who goes to the respondents and tries to befriend them over the time period of her research. This saves the respondents from the discomfort, uneasiness or consciousness of having to deal with a stranger. As a result, the data that is collected is most likely to be more neutral and authentic.

Closeness with the respondents: A good rapport with the respondents enables the researcher to gain access to the important events of the respondents' lives. This further helps her to interpret the significance of those events in a more sensitive way as she herself is a part of it and therefore can obtain a first hand knowledge of the activities in the event, apart from listening to the significance in the respondents' own words, which otherwise might not be open for observation by outsiders.

Validity and insight: Participant observation provides rich qualitative data which gives the researcher a first-hand picture of the reality that is at work in society. The researcher gets to know how the people really live, how they behave in a particular situation and what their take on the world is, in general and in particular, thus resulting in the production of valid empirical data. Personal experiences with the respondents allow the researcher to be more empathetic and reflexive towards her own research. The meanings and viewpoints that get formed through one-on-one interactions enrich the data collected.

Flexibility: By virtue of being unstructured and intuitive, participant observation allows the researcher to go beyond a fixed set of field rules and experiment with different ideas or take up different directions in order to gain data. Further, the spontaneous nature of the field provides the researcher with the flexibility to sometimes go with the flow, which might get her answers to the questions which she probably wouldn't have asked in a normal situation.

Disadvantages of Participant Observation

Despite the advantages that it has as a qualitative research method, there are certain disadvantages that limit participant observation: m

Time-consuming exercise: The most common and widely acknowledged disadvantage of participant observation is that it is tediously time-consuming. Spending quality time with the respondents with the motive of collecting data and at the same time constantly being careful of gaining and not breaking their trust can become a hard task. Patience can be an issue, and repetition of data in conversation can appear irritating over a period of time. m Lack of objectivity: Most of the time it becomes difficult for the researcher to maintain an objective mind while building close relationships with

the respondents and participating in their activities. T. Prolonged familiarity is likely to make him ignore certain events as regular which he/she probably should notice as issues.

Difficulty in documenting data: By virtue of being a physically and psychologically engaging exercise, documenting data during participant observation can become an issue. The researcher might find it hard to write down or record the data when a respondent is providing important information through a casual conversation. Confidentiality and ethical concerns also become an issue, as many respondents do not want the information to be shared anywhere else. In such situations, the researcher has to heavily rely on her memory to remember importants points of conversations, and also has to stay true to her research ethics on what to add to her notes as data and what to let go.

 Issue of representation:

By its very nature, participant observation has to be carried out among a small, closed group or community in order to gain an in-depth and thick data in which researcher is able to reach out to maximum number of respondents and build rapport with most of them. However, the issue of representation comes up here, as the values, viewpoints, opinions, events and social life in general of the community which is studied might not be representative of a greater or universal culture**.**

 Participant observation thus validates the fact that all forms of knowledge are situated knowledge, and have to be understood in their own unique contexts.

2.Non-Participant Observation:

When the observer observes the group passively from a distance without participating in the group activities, it is known as non-

participant observation. Here he does not try to influence them or take part in the group activities.

However, purely non-participant observation is extremely difficult. One cannot penetrate into the heart of a matter without proper participation in it. One really cannot imagine a kind of relationship, when the researcher is always present but never participates. This situation is hardly conducive for both the observer and the group. A combination of both participant and non-participant method is sometimes selected**.**

Advantages of Non-Participant Observation

Objectivity and neutrality : Not actively participating in a situation helps the researcher to observe it with a neutral understanding. It also helps her to gather an objective understanding of what is happening, without being influenced by biases that might occur in active participation. She is also able to notice the occurring which otherwise were likely to get skipped in the hustle of active participation.

Accuracy in analysis: Non-participant observation enables the researcher to be somewhat more careful in his observation, resulting in more accuracy of research findings. The researcher is able to judge or interpret from a certain distance and understand the importance and significance of events more accurately, as she is not distracted by pressure of performance due to participation. The resultant data is potentially free from getting coloured by sympathy or sentiments.

Distance from unnecessary situations: non-participant observation is likely to save the researcher from any potential danger situations as well as from falling a victim to unnecessary groupism. Not having to choose a side and just being able to be a

neutral observer enables the researcher to gather data which is less biased and more neutral, gaining her perspectives from both sides.

Freedom from issues of ethics: Not having to be bothered about ethical concerns is an advantage of non-participant observation. Since the group being observed is often aware of the researcher's position as an observer, the researcher is often free from the burden of concealing and revealing. This potentially helps her to focus on her data.

Disadvantages of Non-Participant Observation

Lack of subjectivity: It is likely that a non-participant observation of any social context will provide a limited insight to the meanings that may be formed out of it. Lack of interaction with the respondents or the group studied prevents the researcher from getting a subjective and empathetic understanding of a social situation. This might also result in misinterpretation of data, and also misrepresentation of the people being studied.

Inadequacy or lacuna in observation: In a non-participant observation, the observation often takes place at the surface level, i.e., the researcher observes only what is happening right in front of her eyes. The respondents may consciously or unconsciously conceal certain information which may then go unnoticed by the researcher, making her lose potentially important data.

Inconvenience in terms of access: non-participant observation can be inconvenient for both the researcher and the researched in terms of being uncomfortably aware of each other's presence. The formal nature of presence often creates disturbance in the natural flow of research as some respondents or communities might not be comfortable with their activities being observed by an outsider (the researcher), leading to inconvenience in collecting information/ data by the researcher. Further, knowledge of being observed might

also lead some groups to behave in a certain way to please the researcher. Manipulation of facts and information by respondents in a formal setting affects research in a negative way.

METHODS OF QUALITATIVE RESEARCH

Case study

With the help of this method a case of an individual, group, event, institution or society is studied. It helps in providing an in-depth knowledge of the nature, process or phenomena of a specific case under study. Multiple methods of data collection are often used in case study research (example, interviews, observation, documents, and questionnaires). The final report of the case study provides a rich and holistic description of the case and its context. A case study method can be used to study a peculiar event or a person suffering from a rare disorder or disease, for example. It can also be used to study certain institutions. Since case study is in depth it requires not only time but apt attention as well from the researcher. With the help of case study a lot of information can be gathered. Certain case studies are also longitudinal in nature where the study is carried out over a period of time. Some of the drawbacks of case study include, only few events/ individuals can be studied and as an outcome of this the results obtained cannot be generalised. Further, it is also a time-consuming method that requires certain expertise on the part of the researcher.

Focus group

In this method of qualitative research, certain questions or issues are discussed by a group of participants. Focus groups can be structured or unstructured and the group could be heterogeneous or homogeneous in nature. It may involve experts who discuss certain important issues or could be individuals from certain communities/ areas discussing certain issues (like women empowerment). The size of the group will depend on the objective(s) of the research (though an ideal size would be twelve and for Delphi groups it could be around four participants) and the participants may or may not know each other. One of the main advantages of this method is that a lot of information is gathered. Though, there are disadvantages as well, as there could be issues related to encouraging the participants to contribute equally and actively. And though this method in a way gives more control to the participants, ethical issues of confidentiality cannot be maintained. Besides, there is also the problem of social desirability on part of the participants that can impact the outcome of the study. The researcher needs to play a role of coordinator in order to facilitate and promote effective discussion and also to avoid any conflict between the participants. He/ she also needs to develop suitable rapport with the participants and provide proper information and instructions. Audio and visual aids can also be used to record the whole discussion that can later be analysed.

Content Analysis

As the name suggests here, the content is analysed. Krippendorf defined content analysis as "a systematic reading of texts and symbolic matter not necessarily from an author's or user's perspective". It can also be termed as technique that involves description of manifested content communication that is

carried out in an objective, systematic and quantitative manner Content analysis thus can be used in order to examine the varied issues ranging from social to cultural, values and events and so on from text, news,advertisements and other such sources. It can also be used in order to study and gain meaningful insights from various texts and documents. It involves a systematic evaluation of the texts and documents where the qualitative data is converted into quantitative data with the help of coding and thus valid interpretations can be made.

Participatory research

Participatory research is both a range of methods and an ideological perspective. Its fundamental principles are that the subjects of the research become involved as partners in the process of the inquiry, and that their knowledge and capabilities are respected and valued.

Participatory research is ultimately about relationships and power. The key relationships are between the researcher and the researcher, and between local people and those actors they see as powerful and who affect their lives. Participatory researchers act as facilitators and work towards attaining equality in these two relationships.

Local people involved in participatory research processes are often subordinate in their own social context, while outside researchers are often perceived as experts who impose their views. Transforming these dynamics is achieved by enabling local people to articulate their views and express their knowledge through describing and analysing their own situation and problems.

Many participatory research processes also have an action component, which involve the participants in successive cycles of analysis, reflection and action.

Interviews:

There are three types of interviews which are used to gather data in qualitative research such as **structured interviews, semi-structured interviews, and unstructured interviews.**

i) Structured Interviews:

Structured interviews are a kind of verbally presented questionnaire. In structured interviews, a list of pre-determined questions is asked to the respondent. The questions are not altered during the interview and no follow-up questions are asked to get an explanation on a given answer. These interviews can be conducted fast because there is almost no chance for both interviewer and respondent to get deviated from the topic. The responses can be compared and analysed easily because of the uniformity of the questions asked.

However, a little bit of explanation can be provided to the respondents in case they require your help to answer a question better. You need to prepare questions in such a way so that they will get you maximum information. Therefore, preparing questions for structured interviews is a long and difficult process. Only a limited number of respondents can be interviewed by the use of structured interview methods.

ii) Unstructured Interviews :

On the other hand, unstructured interviews are conducted with a little or no preparation. Unstructured interviews are a kind of regular

conversation between two people. Unstructured interviews can begin with an opening question like "Can you tell me about your experience visiting a retail store?" and then the interview will progress by asking questions on the basis of the response of the first question.

These interviews also require your skills to form questions in such a way so that they will get you a detailed response. Let us understand this with the help of our first example "Can you tell me about your experience visiting the retail store?". This question is formed in such a way that it will stimulate the respondent to answer it in deep detail. However, the same question formed in "How was your experience of visiting the retail store?".

The respondent will answer this question by simply saying "good or bad". Though you will get your answer, you will not learn anything from it. Hence, you will miss the purpose of your interview. Therefore, a person who conducts unstructured interviews must know how to ask questions so that they will get him a detailed response. In addition to this, you should have a good presence of mind to form questions on the spot.

Unstructured interviews are very time-consuming and they usually last for long hours and they are difficult to participate in and manage, because of the lack of predetermined questions list. Unstructured interviews are suitable for those researches where the interviewer has little or almost no-knowledge about the research topic or researcher wants to get information about a topic from a different perspective.

iii) Semi-Structured Interviews :

Semi-structured interviews are a combination of both structured and unstructured interviews such as, a researcher will come up with a list of questions to be asked in the interview, but he can also ask follow-up questions to get deeper detail or explanation from the respondent on the basis of his response. This type of interview is mostly used for research in the healthcare industry, where interviewers provide guidance to participants on what they should talk about. This helps the participant to provide accurate information.

The flexibility of unstructured interviews and preparation of structured interviews make this interview type a suitable option for qualitative research purposes.

Ethnography

This approach mainly focuses on the study of a particular community. It is more of a kind of close field observation and basically tries to study socio-cultural phenomena. This method mainly involves study of participants in their naturalistic environment. Observation is widely used in ethnography and it is also less structured in nature. The researcher also plays an active role and more often than not participant observation is used. Various other methods like interview, using documentary sources are also employed in ethnography besides observation. One of the main advantages of ethnography is that primary data is collected first hand and thus its validity is higher. Though its disadvantages

include, lack of generalisation, inability to study cause and effect relationship, ineffective description of what is observed and some ethical issues may also crop up while using this method.

Further, employing ethnography is also complex, as the researcher may find it difficult to decide what to study and why to study it. Further, when the problem and objectives of the study have been decided, the researcher may find it difficult to get a smooth entry in to that particular community/ group and form a positive rapport with the members of that community group. Exiting the community/group can again pose a challenge due to the deep relationship and bond that the researcher may develop with members of the community/group. Ethnography does demand expertise on part of the researcher and is a time-consuming method.

Projective Techniques

Projective techniques, originally developed for use in psychology, can be used in an evaluation to provide a prompt for interviews. Photo language is a particular type of projective technique where participants select one or two pictures from a set and use them to illustrate their comments about something. For example, participants in a workshop might be asked to select two pictures - one that represents you at the beginning of this course and one at the end - and then to discuss the pictures and their hopes and fears about the course and its impacts.

Projective techniques are typically divided into five groups (Linzey, 1959):

- **Associative techniques** in which a particular stimulus is used to elicit the first thing that occurs in the subject's mind.
- **Completion techniques** in which the subject is required to complete sentences or drawings (sentence completion or captions in comic-strip callouts).
- **Constructive techniques** in which the subject is required to create a drawing, sculpture, or story.
- **Choice/ordering techniques** in which the subject is required to choose from a group, or to order a group (of pictures, sentences, etc.).
- **Expressive techniques** in which the subject is required to organise and incorporate a particular stimulus into a self-expressive process, such as role playing, psychodrama, dance, etc. In my view, some of the narrative interviews commonly used in qualitative research nowadays also fall into this category

Sociome-try

It is concerned with charting out the attractions and repulsions among the members of a group, among groups (miniature social systems) or sub groups or between the subgroup and individuals. Sociometry involves a set of operations that depart fundamentally from the method employed by Emory Board Gus for the measurement of social distance.

Helen Jennings, one of the pioneers in the field of sociometric studies, **described sociometry as a device for a graphic and straight-forward portrayal of the total configuration of relations among the members of a group at some given point in time**. Such a picture affords at a glance, the main lines of communications and

the whole kaleidoscope of attractions and repulsions among members of the group.

TECHNIQUES OF SOCIOMETRY:-

There are two types of techniques of sociometry.

Guess Who Technique:
 The questions are asked to each pupil in the group e.g., With whom do you enjoy most in gatherings. Whom would you like to
sit next to you in the class?

Nominating Technique:
The questions are asked to the Pupil in the group e.g Name the star of the Class. Name the leader of your group.

First the Sociometric technique is selected, test is administered, data is collected, data is tabulated and interpretation is drawn on analysing the collected data. We may represent the data in graphical from.

ADVANTAGES OF SOCIOMETRY: -

- Sociometry helps in discovering the patterns of choice, rejection, attraction and repulsion among
- the individuals making up the group.
- It facilitates the appraisal of the social adjustment

of the individuals.

- It helps in counselling in the area of social skills
  E.g. If the pupil is maladjusted in the group, then counselling is done to improve adjustment.
- It helps in identifying leaders, isolates, mutual-choice, representatives etc.
- It is useful to have an idea of a group at a glance.

- It helps us to form appropriate groups of students
  for carrying out various activities and projects.
- Sociometry helps us to understand the characteristics
  of an individual who is liked or disliked by the group
  It also assists us in knowing the qualities of leadership as being
  appreciated by a particular group.

**Statistics and computer applications – use of statistics in social research – advantages
and disadvantages. Use of computers in social research – S.P.S.S. Use of internet**

Statistics and computer applications in research

Social statistics is the use of statistical measurement systems to study human behaviour in a social environment.
This can be accomplished through polling a group of people, evaluating a subset of data obtained about a group of people, or by

observation and statistical analysis of a set of data that relates to people and their behaviours.

Statistics is a mathematical science involving the collection, interpretation, measurement, enumerations or estimation analysis, and presentation of natural or social phenomena, through application of various tools and techniques the raw data becomes meaningful and generates the information for decision making purpose.

It is the systematic arrangement of data and information that exhibits their inner relation between the things.

Statistics plays a vital role in every field of human activity and has an important role in determining the existing position of per capita income, unemployment, population growth rate, housing, schooling, medical facilities etc.

in a country, by which the decision making and development plans of the government becomes concentric. Now statistics holds a central position in almost every field of research like **Industry, Commerce, Trade, Physics, Chemistry, Economics, Mathematics, Biology, Botany, Psychology, Astronomy, management** of decision making etc. Through this research article, we have tries to discuss about the role and Importance of Statistics in various sociological and applied fields with their limitations also discusses the integration and coordination of statistical tools with the computer technology, which makes the calculation and interpretation data in very efficient and effective manner. Computer technology has become a lifeline of statistical tools/software's.

Usage and applications of statics

Social scientists use social statistics for many purposes, including:

- the evaluation of the quality of services available to a group or organisation,
- analysing behaviours of groups of people in their environment and special situations,
- determining the wants of people through statistical sampling
- evaluation of wage expenditures and savings
- preventing industrial diseases
- prevention of industrial accidents
- labour disputes, such as supporting the Anthracite Coal Strike Commission of 1902–1903
- supporting governments in times of peace and war

The important limitations of statistics are:

(1) Statistics laws are true on average. Statistics are aggregates of facts, so a single observation is not a statistic. Statistics deal with groups and aggregates only.

2) Statistical methods are best applicable to quantitative data.

(3) Statistics cannot be applied to heterogeneous data.

(4) If sufficient care is not exercised in collecting, analysing and interpreting the data, statistical results might be misleading.

(5) Only a person who has an expert knowledge of statistics can handle statistical data efficiently.

(6) Some errors are possible in statistical decisions. In particular, inferential statistics involve certain errors. We do not know whether an error has been committed or not.

Use of internet in research

Internet

Before you start research, you often want to quickly learn about possible issues or topics of study by searching available sources of information. Nearly all academic journals are available online, and many are organised into online databases. Government agencies often have demographic or economic information online you can use in your research.

Information Storage

Computers store vast amounts of information. You can quickly and efficiently organise and search information, making for easier retrieval than paper storage. You can store your raw data in multiple formats. Some researchers conduct their research online, often through the use of surveys.

Computational Tools

Computers began as powerful calculators, and that service is important to research today. Regardless of the amount of data you have, you can do more with it with a computer's help. Statistical programs, modelling programs and spatial mapping tools are all possible because of computers. Researchers can use information in new ways, such as layering different types of maps on one another to discover new patterns in how people use their environment.

Communication

Building knowledge through research requires communication between experts to identify new areas requiring research and debating results. Before computers, this was accomplished through papers and workshops. Now, the world's experts can communicate via email or webchats. Information can be spread by virtual conferences. Knowledge from marginalised groups, such as African scholars, is now more visible.

Mobility

Researchers can take computers anywhere, making it easier to conduct field research and collect data. New areas of research in remote areas or at a

community level are opened up by the mobility of computers. Social media sites have become a new medium for interaction and information.

Sociology and the Web. The Internet may be one of the largest and probably the most rapidly growing peaceful social movements in history. It is not just a technology, or a family of technologies, but a rapidly evolving socio-cultural phenomena often called "cyberspace" or "cyberculture." No matter how this phenomenon is defined, it is changing the way sociologists conduct their work.

Publications on Sociological Computing. The primary source for articles on social science computer applications is the Social Science Computer Review, a quarterly publication of Sage Publications, Inc., which also regularly offers book and software reviews.

Computer Applications in Sociology. The practice of computing in sociology has evolved rapidly. Computers have been applied to practically every research task, including such unlikely ones as field note-taking, interviewing, and hundreds of other tasks. The many diverse uses of computing technology in social research are difficult to categorise because applications overlap and evolve unpredictably. Nonetheless, it is necessary to discuss different categories of applications in order to describe the state of the art of computing in sociology. S

Writing and Publishing. Once equated with the secretarial pool, word processing now is an activity of nearly every graduate student and professional in sociology. It consists not only of writing but preparing tables, "typesetting" mathematical equations, and resizing objects, such as three-dimensional graphs embedded within text. Social researchers are

using such capabilities and moving rapidly toward workstation environments that obscure the transition between data analysis and manuscript preparation..

Communicating Electronically . Networks for computer-mediated communication (CMC) continue to expand internationally following the traditional logistic diffusion curve (Gurbaxani 1990). Electronic networks now supplement most other forms of social communication..

While e-mail messages are generally written in plain text, "attachments" to email now make it possible for formatted documents, even those including graphics and multimedia, to be shared with others around the world in a matter of minutes. This remarkable technology makes co-authoring, and other forms of collaboration, far more feasible due to reduced time and cost.
As e-mail systems continue to expand, they offer social researchers new opportunities for conducting studies using electronic networks.

Qualitative Computing.

This type of computing became much more common as researchers combined content analysis with other tasks associated with qualitative analysis. Several general-purpose programs for qualitative analysis have been widely distributed These tools make the analysis of large amounts of text more accurate and efficient, and potentially direct the focus of attention to analytic procedures. The general tasks of text entry, code assignment, counting, and data organisation have been extended to include special routines for improving the quality of coding and code management .

Computer-Assisted Data Collection. CATI (Computer-Assisted Telephone Interviewing) is a computing system with online questionnaires or entry screens for telephone interviewers. It has become very common in sociological research, although its impact is not fully understood. It is used on free-standing PCs, networked PCs, or larger computers.

Visualization and Graphics. Many social researchers have come to rely on computer graphic systems to produce maps, charts summarising statistical data, network diagrams, and to retrieve data from GIS (Geographic Information Systems) databases. GIS data contain coordinates to associate a specific spatial point or area with any attribute, e.g., social density, associated with that point or collection of points. Because of the complexities of these data structures, the integration of these techniques onto sociologists' desktops has been slow.

Teaching and Learning. During the 1970s long before the microcomputer, a small group of social science instructors began to explore how to utilize computer technology in teaching.

How SPSS Helps in Research & Data Analysis Programs:

SPSS is revolutionary software mainly used by research scientists which help them process critical data in simple steps. Working on data is a complex and time-consuming process, but this software can easily handle and operate information with the help of some techniques. These techniques are used to analyse, transform, and produce a characteristic pattern between different data variables. In addition to it, the output can be obtained through graphical representation so that a user can easily

understand the result. Read below to understand the factors that are responsible in the process of data handling and its execution.

1. Data Transformation: This technique is used to convert the format of the data. After changing the data type, it integrates the same type of data in one place and it becomes easy to manage it. You can insert the different kinds of data into SPSS and it will change its structure as per the system specification and requirement. It means that even if you change the operating system, SPSS can still work on old data.

2. Regression Analysis: It is used to understand the relation between dependent and interdependent variables that are stored in a data file. It also explains how a change in the value of an interdependent variable can affect the dependent data. The primary need of regression analysis is to understand the type of relationship between different variables.

3. ANOVA (Analysis of variance): It is a statistical approach to compare events, groups or processes, and find out the difference between them. It can help you understand which method is more suitable for executing a task. By looking at the result, you can find the feasibility and effectiveness of the particular method.

4. MANOVA (Multivariate analysis of variance): This method is used to compare data of random variables whose value is unknown. MANOVA technique can also be used to analyse different types of population and what factors can affect their choices.

5. T-tests: It is used to understand the difference between two sample types, and researchers apply this method to find out the difference in the

interest of two kinds of groups. This test can also understand if the produced output is meaningless or useful.

ISSUES AND CHALLENGES

The practice of computing in social research has evolved rapidly. Computers have been applied to practically every research task, including such unlikely ones as interviewing, and hundreds of other tasks.

This variety of computer applications will continue to evolve with the newer Internet-based technologies.

The application of computing to sociology is not without problems.

Errors in data and software abound yet rarely do social scientists check their results by running more than one program on the same data.

Data and software tend to be very costly, but there are many impediments to the sharing of these critical resources.

Better software is needed but graduate students often are discouraged from programming new software.

Nonetheless, new breakthroughs in computer technology will continue, and major new opportunities will emerge.

Many of the advances in sociological computing during the next few years undoubtedly will follow the lines of progress already described: hypertext networks; integrated, high performance, graphic data analysis stations; software for computer-supported cooperative work; and neural networks for complex models of social systems.

Perhaps the most exciting challenge for the future involves a **concert of these innovations directed at the problem of modelling and analysing vast amounts of social data**. One solution would incorporate three-dimensional, multicoloured, dynamic graphical representations of complex social data structures. But new techniques for analysing these

data will require new models of dynamic social structures as well as parallel social processes. Computer representations of these models tend to require extremely fast processing. Access to such models on the Web, supplemented with audio and video displays, may evolve into an important part of the sociologist's tool kit of the future.