

Types of Research Methodology

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1 What is Research?

Research takes place with the purpose of acquiring knowledge to contribute to further investigation or process to inform action, to prove a theory, or to reach a result. To produce fruitful experience, the Research must be of high quality. And types of Research Methodology support to get the best-suited outcome. We can understand the significance of Research with some fundamental points:

- Research is a way to build knowledge.
- It is an essential requirement to start analyzing, writing, reading, and distributing information.
- It nourishes and opens up the minds.
- With Research, different understanding issues seem easy.
- Research helps to build confidence and positivity to try on opportunities.

The importance of Research in any field can't be ignored. But many skip researching before

starting anything. Lazy students and disinterested academics do not realize the need for doing research, but it is an imperative procedure to ensure the safety or positive result of their work.

The research covers not only the education field, but it covers both professionals and non-professionals. Even for non-professionals, it is meant to acquire knowledge which helps them to sharpen their skills to survive around intelligence and improve their confidence.

1.1 DEFINITION

In Research, the word 'research' signifies frequency and intensity, while the 'search' syllable is synonymous with discovery. This way, 'research' means – the repetitive and in-depth findings of the objects. In other words, searching for the core of the items, making some conclusions, discovering new theories, and clarifying those contributions fall under the process of "research".

Research is a well-planned and scientific method of finding solutions to a wide variety of problems. Under the meaning of Research, there is an attempt made to obtain a solution to the problem by collecting various types of data and systematic analysis of the multiple aspects of the issues related.

Research is a systematic method by which new facts are discovered, or ancient facts are confirmed, and they study the sequences, interactions, causal interpretations, and natural laws that determine the points obtained. Research, an attempt is made to solve a theoretical or practical problem.

Research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. Research involves inductive and deductive methods.

Earl Robert Babbie – American sociologist

2 What is the research methodology?

The techniques or the specific procedure which helps the students to identify, choose, process, and analyze information about a subject is called Research Methodology.

It allows the readers to evaluate the validity and reliability of the study in the research paper. In simple words, it describes what you did and what made you reach this obtained result.

It is practical to know 'how' the given Research or any specific piece of Research was done. How a researcher designs a comprehensive study to get a reliable outcome which justifies the objectives of the course can be figured out by research methodology.

For instance: Research Methodology allows us to know:

- How did the Researcher reach to decide: What data should be collected or what data should be avoided.
- How to collect it: The data collection methods of the Research.
- How to analyze it: The data analysis methods of the Research.

In any formal research or a piece of Research (dissertation, thesis, academic journal, or article), there will be a research methodology section that describes what, by whom, how to collect, and how to analyze the data are given. Specifically, in any dissertation, the methodology chapter explains both what methodological choices were made and why they were made.

The methodology section should confirm that the selected methods are the best methods to get reliable and valid results to justify the aims and objectives of the Research. It is of utmost importance to choose the right way so that the work of the Research must be accurate.

Briefly, the systematic way to find out the solution to a problem is Research Methodology. The procedure carried out by researchers to go about their work of explaining and predicting occurrences. Providing the work plan to Research is the aim of Research Methodology.

3 Importance of Research Methodology in Research

To solve the difficulties coming in the way of Research is the main work of designing a methodology. It is necessary not just to identify the problem for Research but to determine the best method to solve that problem as well.

For instance to understand: the person who is researching need not just to know how to calculate mean etc. for a set of data, or how to find a solution of a physical system, or how to find the roots of algebraic equations but also need to know-

1. a suitable method for the decision problem.
2. the order of accuracy of the outcome of a way for the problem.
3. the efficiency of the way.

The role of Methodology in solving the problems in the way of Research are:

- It helps in deciding the best method to resolve the difficulties for Research.
- Research describes how efficient the method is in solving the problem
- It aids to know the accuracy of the way decided to apply in Research for a suitable outcome.

The detailed study of Methodology of Research teaches to select the best method, data or information, scientific ways and teaches the techniques to solve the problem.

4 How research methodology is different from research methods?

Research Methodology is confused with Research Methods, and often beginners use both the terminology interchangeably and sometimes consider them one. However, both are different from each other and having noticeable differences between them. In one place, the method by which you research a topic or subject is termed as Research Method. On the other hand, research methodology shows the way by which researchers can proceed with their Research.

Technically, Research methods include experiments, tests, surveys, and so on on the topics. On the contrary, research methodology teaches the various techniques which help in Research

and teaches how to perform tests, experiments, surveys, and critical studies of the subject or a topic.

The science to learn how Research of a particular case or matter is to be carried out to get the outcome is Research Methodology. It describes the process used by researchers to describe, explain, and predict the occurrence. By research methodology, one can learn the methods to gain knowledge. In short, it is the work plan for any research.

All the methods which help the Researcher to carry out research, and this involves different steps, schemes, and algorithms are termed as research methods.

Anonymous

4.1 MEANING OF RESEARCH METHODS

With research methods, data, samples, and information are collected to find the result of a problem. These methods are value-neutral, well-planned, and scientific, which also include collecting data, carrying out theoretical procedures, experimental studies, numerical schemes, statistical approaches on Research.

Research Methods stress on only those explanations which a researcher can verify by conducting experiments. The reasons which are involved in the investigation must be based on collected facts, measurements and observations.

In simple words, finding a solution to a problem is the main target of research methods. While research methodology is the employment of adopting the correct procedures to reach out to the answers. Research methodology shows the right way to research methods to be applied correctly for the best result. In any scientific or non-scientific research, Research methodology is the beginning, whereas research methods are the end. To obtain a perfect outcome of the Research, the Researcher should be good at both research methods and research methodology.

5 What are the types of Research Methodology?

Any research uses many different types of research methodologies which include a collection of data, designing research structure, analysis of data etc. The term is used for the structured process of conducting Research. The primary purpose of conducting Research through research methodology is to find answers of:

- Why is Research started?
- What are the reasons behind the formulation of the Hypothesis?
- How can research problems be known?
- What and from what sources data have been gathered?
- What specific method will be best worked?

There are different types of Research Methodology used in conducting research. Research methodology professors have concluded these methods, and according to them, Qualitative re-

search methodology and Quantitative research methodology are two main types of research methodology.

5.1 QUALITATIVE RESEARCH METHODOLOGY

The qualitative research methodology is descriptive and subjective irrespective of facts. Observation and description are more important in this type of Methodology. The main aim of this type of Methodology is to evaluate knowledge, attitudes, behaviours, and opinions of people about the Research's topic. The method works using grounded Research, case study, action research, disclosure analysis, ethnography, etc. The qualitative research methodology is based on the quality of the phenomenon.

In qualitative methods, intensity, amount or frequency of Data is immaterial. It focuses on non-rigorous examination or measurement of data. For qualitative Research, size doesn't matter. It understands feelings, viewpoints, and impressions. The useful qualitative method encompasses highly focused, flexible, and provides quick results. However, there is a scope of misunderstanding and misuse of qualitative methods.

5.1.1 Critical Characteristics of Qualitative Research

When an event is viewed in context, it would be understood adequately. Therefore, a qualitative researcher immerses himself in the setting.

- The contexts of inquiry are natural and not predefined.
- Qualitative Research is an interactive process in which researchers wish to have people who can speak for themselves and give their perspective.
- The aim of qualitative research is to understand the experience of one as nearly as possible.

5.1.2 Strengths of Qualitative Research

Researchers closely study data which provides them insight views of the problem, which is ignored by the researchers who focus on scientific measurements. It focuses more on suggesting causes, effects, possible relationships etc. Irrespective of the fact that it doesn't use statistics, it is more descriptive in nature. It is way soulful for social analysis.

5.1.3 Limitations of Qualitative Research

Data collection, analysis of data, and interpretation of Data is a lengthy process. Subjects of study of Research can be affected by a researcher's presence. While choosing a finding, anonymity and confidentiality of issues can create hurdles. Reliability and validity of the study can be significant concerns.

5.2 QUANTITATIVE RESEARCH METHODOLOGY

This type of research methodology tests the importance of the Hypothesis of Research. This is a systematic research methodology and is in numbers. The quantitative research methodology includes laboratory experiments, econometric, mathematical calculations, surveys, simulation etc.

The measurement, quantity or amount is the critical factor in Quantitative research methodology.

In quantitative research methodology, the analysis and measurement of data and relationship between variables are essential. It involves number based Research which measures attitude, behaviour, and performance in numbers. This method makes data easier to interpret. It requires those techniques which can apply to a larger view. The data received for the purpose to use in quantitative research methodology can effectively convert into graphs or charts. So, there will be a difficulty for an interpreter to influence it.

In this method, the data concerned can be analyzed in numbers. The results obtained from this research method are analyzed and interpreted easily. As the term suggests, the quantitative way is the collection and analysis of data which can be found in numeric form. Large-scale and representative sets of data are required for adopting this type of Research Methodology. This method is comparatively expensive.

5.2.1 Critical Characteristics of Quantitative Research Methodology

Control It helps the Researcher to identify the cause of his/her observation. Experiments are meant to get the outcome of problems. They try to find why certain things happen and what causes that thing. Control provides unambiguous answers to the questions mentioned above.

Operational Definition To eliminate any ambiguity in the meaning of any term and establish communication. There should be some steps or operations to measure the terms. E.g., 'Anxiety is the reason behind student failure in the test.'

Now, the question will arise 'What is meant by anxiety?' If someone answers, anxiety means being tense. Then it adds to the confusion to the meaning only. On the contrary, one defines stress as a score over a criterion level on an anxiety scale that helps others to understand what anxiety is!

Replication Replication of data requires reliable obtained data. It means if the process is repeated, it generates the same result. If something happens differently, then explanations and descriptions are considered unreliable.

Hypothesis Testing The systematic construction of a hypothesis which subjects to an empirical test.

5.2.2 Strengths of Quantitative Research Methodology

- Quantitative methods provide precision as it uses reliable measurement.
- It controls through design and sampling of data.
- It can generate causal statements by controlled experiments.
- Quantitative methods use statistical techniques that help in sophisticated analyses.

5.2.3 Limitations of Quantitative Research Methodology

- The human experience is absent in this Methodology, so it loses control over all variables.

- Quantification sees no beginning in itself.
- It does not take people's unique ability into consideration; constructs their meanings and applies it.
- It creates an assumption for facts to be accurate, and it remains the same for all people.
- Due to controlled variables, Quantitative Research produces trivial findings of little situations.

The Researcher takes involvement in choosing the problem significant for investigation subjectively. So, it is not objective.

6 Types of Research in Research Methodology

The systematic and logical search for useful information or result is Research of a particular topic. To find a solution to the problem by performing systematic analysis, researchers initiate any research on the subject of their interest. They use different methods of Research which comes under research methodology.

Following are the types of Research in research methodology:

Basic Research Non-commercial Research is basic Research whose motive is to collect data to enhance knowledge. It doesn't focus on creating or inventing anything during the process. This type of Research is like an investigation carried on basic principles, and it is also termed as theoretical Research. Examination on principles of basic science or natural events which may not allow for an immediate purpose or application.

Basic Research is quite essential in character and not suitable to find solutions to any practical problems which require quick results. The primary research method provides in-depth and systematic insight into a subject to make scientific and logical explanations easier. With the approach of primary research methods, a researcher draws new boundaries of knowledge. The outcome of basic Research forms a primary platform for applied research methods. The results of basic Research proves useful for a researcher who uses techniques of applied Research.

For instance: Basic research methods apply on experiments to find simple facts.

Applied Research To solve real-life problems, the applied research method is best suited. Unlike basic research methods, used research methods solve practical problems which require scientific methods to incorporate.

A researcher solves problems with already known and proved theories when they apply applied research methods. The Research which provides immediate outcomes and helps basic Research as well is involved Research. Case studies, experimental Research, and interdisciplinary Research are applied Research. This type of Research is of practical use such as Research on pollution control, inventing vaccines for a new disease, increasing efficiency and production of machinery.

For instance: To find a specific cure for a disease. The study of medical science teaches students to take care of humans.

Problem-Oriented Research This type of research methods aims to understand what the exact problem is and what would be the best solution to this problem. The problem-oriented Research justifies its name as it focuses on the issue to find out relevant outcomes. The word ‘problem’ doesn’t mean only one problem arising in the Research, but the number of problems may vary.

For instance: If the revenue of a mobile company shows decrements of 12%. In this case, the problem-oriented method of Research will be applied to figure out the exact problem behind the loss, which would be low quality, non-catchable ads, the economic condition of the company etc.

Problem-Solving Research After application of the Problem-oriented research method, there comes a Problem-solving research method. In this type of research method, the Researcher tries to understand the exact problem, and he starts working on different measures to solve that problem. Applied research methods are the best suited to solve the existing issues as these are real-life problems.

Qualitative Research Qualitative Research focuses on the phenomenon related to quality which has no connection with numeric values, descriptive, applies to reason etc. It aims to understand the feeling, meaning, and to explain the situation. The process to initiate inquiry and create an in-depth understanding of issues in their natural environment falls under Qualitative research method, which is a non-statistical method. For instance, If a researcher wants to know why specific data are random, then he will use the Qualitative research method.

The experience of a researcher works in favour when he is applying the Qualitative research method. Below mentioned are the methods used for Qualitative Research:

- One-to-one interview
- Focus groups
- Ethnographic Research
- Content/Text Analysis
- Case study research

Quantitative Research This type of research method is particular and uses a structured way to collect data and analyze it to get the results. Quantitative method research is not similar to Qualitative method of Research as in Quantitative approach, computational and statistical process is involved to gather and analyze data. It is all about numbers. This method of Research is dependent on the measurement of quantity or amount, not the quality of a product. The process involved in the Quantitative research method process is expressed in terms of one or more portions or numbers. For instance, If a researcher wants to study how random the Data is, what is the mean, variance, then it is quantitative.

In the Quantitative research method, to collect more data, the inclusion of the larger population is done, which helps in drawing accurate results. In this method, the sources of data collection for Research are online surveys, questionnaires, and public polls. With the online surveys, the surveyor reaches a large number of people and hence can collect more data. Surveys on mobile phones, through emails or texts, are the standard means these

days.

Other Types of research methods in Research Methodology are action research, explanatory Research, exploratory Research, and comparative Research.

The action research helps in finding facts that can improve the quality of things. The explanatory Research helps in finding explanations for events. In exploratory Research, a researcher tries to find more information on a topic. While, in comparative Research, the Researcher works on drawing similarities and dissimilarities between methods, techniques etc.

7 Types of Report in Research Methodology

Reports from the analysis differ vastly in duration and form. That the concerns at hand essentially determine both time and the shape in each particular case. Business organizations, for example, prefer reports in letter format, in range of only one or two sheets.

For their financial statements to their clients and investors, banks, insurance organizations, and banking firms are usually fascinated by the short income statement style tabulation. Mathematicians prefer to write the findings of their observations by algebraic expressions. Through symbols and equations, pharmacists publish their outcomes.

The above narrative sheds highlighting the fact that the findings of a research study can be interpreted in a variety of ways, i.e., a technical report, a famous report, an essay, a manuscript or sometimes even in the form of verbal presentation. The presenting method(s) to be utilized in a specific study relies on the situation under which Research occurred and the quality of the findings.

A technical report shall be used if a complete written study report, whether for bookkeeping purposes or for publishing information, is needed. A popular account can be used when the findings of the analysis have consequences for the plan.

7.1 TYPES OF REPORT

Let's look at six different types of reports.

- 1. Formal or Informal Submissions** They emphasize impartiality and coordination, include a lot more detail, and are published in a format that seeks to avoid aspects such as pronouns. Formal reports are highly organized. Informal words are typically brief messages that have regular, everyday language usage. In particular, internal documentation can be defined as a casual paper.
- 2. Quick Reports or Long Reports** It is a classification that is complicated. A one-page summary is short, and a twenty-page report indeed is lengthy. And where's the boundary which separates? Keep in mind that it requires more features of formal reports as a paper gets long (or what you decide as long as).
- 3. Analytical or Informative Reports** Information reports (audit report, monthly financial statements, and staff absences reports) bring reliable information from one part of an organization to the next. Technical info (scientific studies, project reports, and real-estate assess-

ments) represent efforts at solving the problem.

- 4. Report on a Proposal** The suggestion is a difference in papers relating to solving problems. A request is a memorandum which is planned to explain how one company should satisfy the other's needs.

Many government departments highlight their demands by submitting "Proposal requests" or expense reports. The Document defines a requirement, and a proposal report is prepared by different suppliers explaining how they can fulfill the necessity.

- 5. Vertical Reports or Lateral Reports** This identification points to the path a report is going in. Documents that the structure is alluded to as hierarchical reports more upwards than downwards; those reports tend to the regulation of the management. On the other hand, lateral reports help organize in the organization.

- 6. Internal Reports or Outside Reports** Internal reports circulate throughout the business. Outside reports, like annual business reports, are designed for dissemination outside the organization.

Reports play a significant role in business development in the modern business world. Documents are the pillar of the establishment's thought process and are primarily liable for the evolution of a productive or ineffective work setting.

8 Types of Hypothesis in Research Methodology

A hypothesis is a statement produced on the assumption of some proof. This is the starting step of any research that converts a forecast into qualitative Research.

That involves elements such as variables, population and the relationship between the variables. A study hypothesis is a hypothesis used to assess the correlation between two or more factors.

The focus of the Research is relevant to this theoretical relationship. This rational relation is called a hypothesis between different anomalies. And this sensible relationship or provable inference gives the research direction, determines the research emphasis and allows to frame methodological approaches.

8.1 HYPOTHESIS FEATURES

Hypothesis features are as follows:

- The theory for it to be accurate should be transparent and specific.
- If the Hypothesis is a quantitative assumption, then the interaction between variables should be specified.
- The theory must be precise and should have the potential for carrying out further experiments.

8.2 HYPOTHESIS ORIGINS

Hypothesis origins are as follows:

- The correlation of phenomena.
- Assumptions from previous Research, insights from today, and rivals.
- Theoretical Research.
- Common trends that affect the thought process of individuals.

8.3 FORMS OF HYPOTHESIS

Six conditions of Hypothesis exist, and these are:

Simple Hypothesis	It shows a relationship between one dependent variable and a single independent variable. For example, – If you eat more vegetables, you will lose weight faster. Here, eating more vegetables is an independent variable, while losing weight is the dependent variable.
Complicated Hypothesis	It illustrates the connection of two or more dependent variables with two or more independent variables. Consuming more fruits and vegetables contributes to weight loss, perfect skin, reducing the risk of many illnesses, such as heart disease, high blood pressure, and certain cancers.
Directional Hypothesis	This illustrates how an investigator is analytical and dedicated to a specific result. Even the relationship between the variables may forecast their existence. For example, children aged four years who eat proper food over five years have higher IQ levels than children who do not wear appropriate food. It indicates the influence and direction of the impact.
Non-directional Hypothesis	It has been used when it does not require any explanation. It is a hypothesis that there is an interaction between two variables, without forecasting the relationship's precise nature (position).
Null Hypothesis	It offers a declaration contradictory to the Hypothesis. It's a negative assumption, and the connection between independent and dependent variables is not present. A symbol is labelled with "HO."
Associative and Causal Hypothesis	An associative hypothesis arises when one variable shift, contributing to a change in the other variable. The causal theory, however, suggests an association of impact and consequence between two or more variables.

8.4 HYPOTHESIS EXAMPLES

Here are the examples of their forms of Hypothesis:

1. An example of a simple hypothesis is the consumption of sugary drinks every day that contributes to obesity.
2. An example of a null hypothesis is that all the lilies have the same number of petals.
3. If a person gets 7 hours of sleep, then less exhaustion will be felt than if he sleeps little.

A research hypothesis is a real, simple, and testable idea or predictive assumption on the

potential outcome of a population-based scientific research study, such as supposed variations between groups on a specific variable or interactions between variables.

9 Types of Scaling in Research Methodology

The complete info about the different scales that are utilized in data analysis is given under this section. There are four types of scaling methods. All factors fall in one of these scales. Understanding the numerical properties and doling out the legitimate scale to the elements is significant because they figure out which numerical activities are permitted. That decides measurable tasks we can utilize.

The above mentioned four scales are Nominal, Ordinal, Interval and Ratio scale respectively with Nominal having least mathematical properties, trailed by Ordinal and Interval, though Ratio having most mathematical properties.

Nominal Scale Keeping in mind the Statistical perspective, it is the most minimal estimation level. The minor scale is appointed to things that are isolated into classes without having any request or structure, for example, Colors don't have an allocated order, We can have five hues like Blue, red, green, yellow, and orange.

Here the numbers are assigned to shading only with the end goal of ID and requesting them Ascending or Descending which doesn't imply that Colors have an Order. The number gives us the character of the classification doled out. The main numerical activity we can perform with nominal information is to check. Another model from research exercises is based on a Yes or No scale, which is insignificant. It has no structure, and there is no separation among NO and Yes.

Ordinal Scale Ordinal Scale factors have the property of Identity and Magnitude. The numbers speak to a quality being estimated. They can reveal to us whether a case has a more significant amount of the quality calculated or less of the quality assessed than another point. The separation between Scale focuses isn't equivalent. Positioned inclinations are introduced to act as an illustration of ordinal scales experienced in regular daily existence. Subsequently, an ordinal scale lets the specialist decipher net request and not the general positional separations.

Interval Scale This scale is a stretch scale, for example when requested to rate fulfilment with a preparation on a 5-point scale, in which there are options like Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree. A span scale is being utilized. It is a span scale since it is expected to have an equivalent separation between every one of the scale components, for example, the Magnitude between Strongly Agree and Agree is thought to be identical to Agree and Strongly Agree.

This implies we can decipher contrasts somewhere out there along the scale. We contrast this to an ordinal scale where we can discuss differences all together, not contrasts in the level of request I-e the separation between reactions. Properties of Interval Scale are

- Magnitude
- Identity

- Equal Separation

Ratio Scale This one is at a high degree of the scale. The factor which characterizes a proportion scale is that it has a real zero point. The most straightforward case of a proportion scale is the estimation of length, which ignores any philosophical focuses about characterizing how we can distinguish zero-length or cash. Having zero length or zero money implies that there is no length and no cash except for zero temperature isn't an outright zero, as it indeed has its impact. Proportion sizes of estimation have the entirety of the properties of the theoretical number framework. Properties of Ratio Scale

- Magnitude
- Identity
- Complete zero
- Equal Separation

10 Types of Variables in Research Methodology

10.1 VARIABLE

A variable in polynomial math truly represents one thing that is an absolute value whose value is unknown. Nonetheless, in measurements, you'll go over many sorts of factors. Most of the time, the word implies that you're managing something obscure.

Still, it is dissimilar to variable based mathematics that obscure isn't generally a number. Some types of variables are utilized more than usual. For instance, you'll be significantly more prone to go over ceaseless factors than you would dummy factors.

10.2 VARIABLES IN RESEARCH METHODOLOGY

In research methodology, A variable is any property, a trademark, a number, or an amount that increments or diminishes after some time or can take on various qualities (rather than constants, for example, n, that don't change) in multiple circumstances.

For this situation, the variable is the kind of manures. A social researcher may look at the potential impact of early marriage on separate. Here first marriage is the variable. A business specialist may think that it's helpful to remember the profit for deciding the offer costs. Here profit is the variable.

10.3 TYPES OF VARIABLES

Qualitative Variables Qualitative factors are those that express a personal property, for example, religion, sexual orientation, race, nationality, caste, societal position, strategy for installment, etc. The estimations of a subjective variable don't infer a significant mathematical requesting

Quantitative Variables Quantitative factors, likewise called numeric factors, are those factors that are estimated regarding numbers. A primary cause of a quantitative variable is an

individual's age.

Discrete and Continuous Variables Quantitative factors are of two kinds that are continuous and discrete. Factors, for example, a few youngsters in a family unit or several bad things in a container are discrete factors since the potential scores are discrete on the scale. And other than this, if you have something which value may come in decimal is known as continuous variables.

Independent and Dependent Variables The variable that is utilized to depict or gauge the factor that is accepted to cause or possibly to impact the issue or result is called an independent variable. The variable that is utilized to portray or quantify the problem or result under examination is known as a dependent variable.

In a causal relationship, the reason is the independent, and the impact is the reliant variable. On the off chance that we theorize that smoking causes a cellular breakdown in the lungs, smoking is the free factor and malignancy the needy variable.

Background Variable In pretty much every investigation, we gather data, for example, gender, age, instructive fulfilment, financial status, conjugal status, religion, the spot of the birth, and so forth. These factors are alluded to as background variable.

Background Variable In so many experiments, it remains a point to concern the recognizable proof of a solitary autonomous variable and the estimation of its impact on the needy variable. Yet at the same time, a few factors may influence our speculated relationship, accordingly contorting the study. These factors are alluded to as Extraneous factors.

Suppressor Variable As a rule, we have valid justifications for accepting that the factors of interest encapsulate a relationship, however our information neglect to build up any such relationship. Some shrouded components might be smothering the genuine connection between the two unique factors. Such an element is alluded to as a suppressor variable since it stifles the real relationship between the other two parts.

11 Types of Data in Research Methodology

Raw and unorganized facts or a set of values of subjects that need to be processed is called Data. Without a proper organization, the Data is of no use and just some random things. After the collection of data, there will be a need to process it, organize it, make the structure of it and then finally present it in a useful way which is termed as information. In short, after the process, data becomes information. Not data but processed data, i.e., the story is essential to conduct Research. That Data can be acquired in various forms and from multiple means. Research papers, journal articles, web sites, books and blogs are used to collect data. A qualitative research methodology is the best Methodology to analyze the data contained in textual form.

The Researcher assigns a specific value to every Data, and each Data describes things of unique quality. Organization, process, and presentation of these values are essential for analysis to get the best result of Research.

The different types of data in research methodology are described below:

Qualitative data Qualitative data are those data which contains words and description and are

in textual form. This type of Data is not easy to analyze in Research as it is of the subjective kind, especially when it comes to comparing it with other information.

For example, Researcher collects quality data from personal interviews, open-ended questions, and focus groups. This type of data describes taste, experience, texture, or opinion.

Quantitative data Quantitative data are those data which are expressed in numbers or numerical figures. This type of data can be measured, ranked, calculated or grouped.

Example: This type of data contains questions like age, scores, rank, cost, length, weight, etc. In short, every Data which is in the form of numbers. Also, such numerical data can be presented in graphical format, charts, or can be applied in statistical analysis methods.

Categorical data When Data is available in groups but does not belong to more than the belonged group is called Categorical data. The data grouped into a category is Categorical data.

Example: If there were a survey which asks people to tell their marital status, age, smoking habit, and drinking habit, this information collected from people are categorical data. In simple words, the data of categorical type represents discrete numbers which belong to a specific category or class.

Based on the methods of data collection, data can be divided into four types: observational, experimental, Simulation, and derived.

Observational Data A researcher observes things or people and their behaviour or activity to collect data which comes under observational data. Methods used to collect observational data are human observation, open-ended surveys, or interviews. The collection of this type of data depends on real-time. The re-creation of observational Data is not accessible if lost.

Experimental Data The data collected by tests, experiments, measurements, and quasi-experimental designs is called Experimental data. When a researcher intervenes to produce, alter or measure any change in the investigation to collect data, he collects Experimental data. This method of collecting data can be applied based on the need of researchers where it is qualitative or quantitative. Experimental Data is comparatively easier to analyze and interpret.

Simulation Data To imitate the operation of a system or a process which describes the procedure over time is Simulation. And by using computer test models to imitate the operation of a real-world system or method generates simulation data. Simulation data helps to find what could or what would take place under a specific condition. Experimenting through the computer are often used to collect simulation data.

Example: weather conditions are predicted by simulating data.

Derived / Compiled Data This type of data use other base data, and it involves the process of creating new data from existing data through some transformation. It is entirely new data constructed from one or more existing data. Derived data are new data or information, and it provides new ways of presenting old or raw attributes.

Example: Population density data can be obtained by a combination of data of area and population. If lost, researchers can replace this type of data. However, it will be expensive and time-consuming.

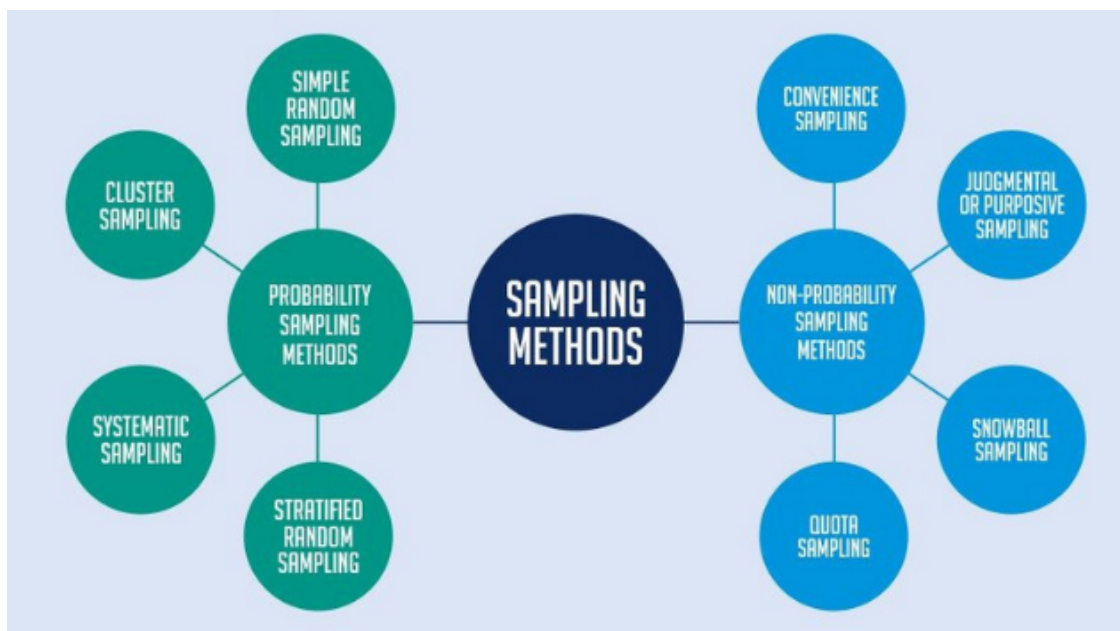
12 Types of Sampling in Research Methodology

12.1 SAMPLING

It is a strategy of choosing singular individuals or a subset of the population to build factual inferences from them and gauge attributes of the entire territory. Analysts in statistical surveying broadly utilize diverse inspecting techniques, so they don't have to investigate the whole population to gather significant experiences. It is additionally a period advantageous and a practical approach and subsequently shapes the premise of any exploration plan. Inspecting strategies can be utilized in an exploration overview programming for the ideal deduction.

12.2 TYPES OF SAMPLING

Before we examine the various types of inspecting, let us talk about what the term sampling means. In the research field, this term is considered to be an example for the gathering of individuals, articles, or things that are taken from a vast populace for estimation. Along these lines, to get the precise outcomes, testing is finished.



For instance, if we need to check all the chips in a manufacturing plant made are acceptable or not, it is tough to check each chip, so to check, we will be taking an arbitrary fragment and check for its exact taste, size, and shape.

12.2.1 Types of sampling

Probability Sampling	This sampling technique is an inspecting strategy where a specialist sets a determination of a couple of rules and picks individuals from a populace arbitrarily. All the individuals have an equal chance to be an aspect of the example with this choice boundary.
Non-Probability Sampling	In the non-probability technique for sampling, the scientist picks individuals for Research aimlessly. This inspecting technique is not a fixed or pre-defined choice cycle. This makes it hard for all components of a populace to have equivalent chances to be remembered for an example.
Simple random sampling	Outstanding amongst other sampling and testing strategies that help in sparing time and assets, is the Simple Random Sampling strategy. It is a dependable technique for getting data where every individual from a populace is picked haphazardly, just by some coincidence. Every individual has a similar likelihood of being selected to be an aspect of an example.
Systematic sampling	Scientists generally utilize the systematic sampling strategy to pick the example of individuals from a populace at familiar stretches. It requires more of the choice of a beginning stage for the model and test size that can be re-hashed at regular intervals. This kind of testing technique has a predefined range, and subsequently, this examining procedure takes significantly less time than other strategies.
Cluster sampling	This sampling strategy is where the analysts separate the whole populace into areas or bunches that speak to a crowd. Groups are recognized and remembered for example dependent on segment boundaries like sexual orientation, age, location, and so forth. This makes it necessary for an overview maker to get robust derivation from the responses.
Stratified random sampling	Stratified random sampling is a technique where scientist separates the populace into littler gatherings to make analyzing more accessible that don't cover but shows the whole public. While inspecting, these gatherings can be composed and afterward draw an example from each group independently. This sampling technique is majorly used in the real world.

13 Conclusion

After a detailed study of what Research is, what research methodology is, and what are types of research methodology, it is clear that for any research there are specific methods to be followed for good or say accurate results. To know the answer of all 'how' of any given Research or subject of Research, application Research Methodology and types of Research Methodology is essential.

Through using any of the types of Research Methodology, a researcher can systematically design the study to get reliable results. Also, Research Methodology should justify that the selected type of research methodology is the fittest for the best outcome. A sound research methodology results in scientifically sound effects, but flawed research methodology fails to do so. So, the Researcher should invest in the sound and reliable type of research methodology to apply in

Research to get an accurate result.

14 FAQs

What are different types of Research Methodology?

Qualitative Research Methodology and Quantitative Research Methodology are mainly two types of Research Methodology which cover all the aspects of methodologies of any Research.

What is the difference between Research Methodology and Research Methods?

The way by which researchers can proceed with their Research is Research Methodology while the method by which a research is conducted on a topic or subject is termed as Research Method.

Why Research Methodology is important for a Research?

The reason behind designing the methodology for a Research is to solve the difficulties coming in the way to conduct Research.

What is problem oriented research?

Problem oriented research is one of the types of Research which targets to determine the the exact problem and then to find the best solution to that problem. The aim to apply this research type is to focus on the problem to find out relevant outcomes. Infact, the word 'problem' means not only one problem but the number of problems may vary.