BUSINESS RESEARCH METHODS

INTRODUCTION

The word 'Research' is derived from the French word, 'Researcher' meaning 'to search back". A man in his social, economic, educational, political and business life faces many problems.

The term 'Research' consists of two words:

Research = Re + Search

'Re' means again and again and 'Search' means to find out something.

Therefore, research means to observe the phenomena again and again from different dimensions. For example there are many theories of learning due to the observation from different dimensions. The research is a process of which a person observes the phenomena again and again and collects the data and on the basis of data he draws some conclusions.

Research is oriented towards the discovery of relationship that exists among phenomena of the world in which we live. The fundamental assumption is that invariant relationship exists between certain antecedents and certain consequents so that under a specific set of conditions a certain consequents can be expected to follow the introduction of a given antecedent. Research refers to a search for knowledge. Research is an art of scientific investigation. Research is a systematic and objective process of gathering, recording and analyzing data for aid in making business decisions. Business research is a systematic and organized effort to investigate a specific problem encountered in the work setting that needs a solution.

DEFINITION OF RESEARCH

In the Encyclopedia of Social Sciences, D. Slesinger and M. Stephension (1930) defined research as "the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in the construction of theory or in the practice of an art".

Fred Kerlinger: "Research is an organised enquiry designed and carried out to provide information for solving a problem."

Francis Rummel: “Research is a careful inquiry or examination to discover new information or relationships and to expand and to verify existing knowledge."

Robert Ross: “Research is essentially an investigation, a recording and analysis of evidence for the purpose of gaining knowledge."

The Advanced Learner‟s Dictionary of Current English lays down the meaning of research as, “a careful investigation or inquiry specially through search for new facts in any branch of knowledge”.

Redman and Mory define research as a,” Systematized effort to gain new knowledge”. Some people consider research as a movement, a movement from the known to the unknown.

According to Clifford woody, research comprises “defining and redefining problems, formulating hypothesis or suggested solutions collecting, organising and evaluating data, making deductions and reaching conclusions; to determine whether they fit the formulating hypothesis”.

Thus, research is an original addition to the available knowledge, which contributes to its further advancement. It is an attempt to pursue truth through the methods of study, observation, comparison and experiment. In sum, research is the search for knowledge, using objective and systematic methods to find solution to a problem.

OBJECTIVES OF RESEARCH

The objective of research is to find answers to the questions by applying scientific procedures. In other words, the main aim of research is to find out the truth which is hidden and has not yet been discovered. Although every research study has its own specific objectives, the research objectives may be broadly grouped as follows:

1. To gain familiarity with a phenomenon or to achieve new insights into it (studies with this
object in view are termed as *exploratory* or *formulative* research studies);

2. To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as *descriptive* research studies);
3. To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as *diagnostic* research studies);
4. To test a hypothesis of a causal relationship between variables (such studies are known as
hypothesis-testing research studies).

MOTIVATION IN RESEARCH

The possible motives for doing research may be either one or more of the following:

1. Desire to get a research degree along with its consequential benefits;
2. Desire to face the challenge in solving the unsolved problems, i.e., concern over practical
problems initiates research;
3. Desire to get intellectual joy of doing some creative work;
4. Desire to be of service to society;
5. Desire to get respectability.

However, this is not an exhaustive list of factors motivating people to undertake research studies. Many more factors such as directives of government, employment conditions, curiosity about new things, desire to understand causal relationships, social thinking and awakening, and the like may as well motivate (or at times compel) people to perform research operations.

SIGNIFICANCE OF RESEARCH

"All progress is born of inquiry. Doubt is often better than overconfidence, for it leads to inquiry, and inquiry leads to invention" is a famous Hudson Maxim in context of which the significance of research can well be understood. Increased amounts of research make progress possible.

Research inculcates scientific and inductive thinking and it promotes the development of logical habits of thinking and organisation. *The role of research in*

several fields of applied economics, whether related to business or to the economy as a whole, has greatly increased in modern times. The increasingly complex nature of business and government has focused attention on the use of research in solving operational problems. Research, as an aid to economic policy, has gained added importance, both for government and business.

Research provides the basis for nearly all government policies in our economic system. For instance, government's budgets rest in part on an analysis of the needs and desires of the people and on the availability of revenues to meet these needs. The cost of needs has to be equated to probable revenues and this is a field where research is most needed. Through research we can devise alternative policies and can as well examine the consequences of each of these alternatives. Decision-making may not be a part of research, but research certainly facilitates the decisions of the policy maker. Government has also to chalk out programmes for dealing with all facets of the country's existence and most of these will be related directly or indirectly to economic conditions. The plight of cultivators, the problems of big and small business and industry, working conditions, trade union activities, the problems of distribution, even the size and nature of defence services are matters requiring research. Thus, research is considered necessary with regard to the allocation of nation's resources. Another area in government, where research is necessary, is collecting information on the economic and social structure of the nation. Such information indicates what is happening in the economy and what changes are taking place. Collecting such statistical information is by no means a routine task, but it involves a variety of research problems. These days nearly all governments maintain large staff of research technicians or experts to carry on this work. Thus, in the context of government, research as a tool to economic policy has three distinct phases of operation, viz.,

(i) Investigation of economic structure through continual compilation of facts;

(ii) Diagnosis of events that are taking place and the analysis of the forces underlying them; and (iii) the prognosis, i.e., the prediction of future developments.

Research has its special significance in solving various operational and planning problems of business and industry. Operations research and market

research, along with motivational research, are considered crucial and their results assist, in more than one way, in taking business decisions. Market research is the investigation of the structure and development of a market for the purpose of formulating efficient policies for purchasing, production and sales. Operations research refers to the application of mathematical, logical and analytical techniques to the solution of business problems of cost minimisation or of profit maximisation or what can be termed as optimisation problems. Motivational research of determining why people behave as they do is mainly concerned with market characteristics. In other words, it is concerned with the determination of motivations underlying the consumer (market) behaviour. All these are of great help to people in business and industry who are responsible for taking business decisions. Research with regard to demand and market factors has great utility in business. Given knowledge of future demand, it is generally not difficult for a firm, or for an industry to adjust its supply schedule within the limits of its projected capacity. Market analysis has become an integral tool of business policy these days. Business budgeting, which ultimately results in a projected profit and loss account, is based mainly on sales estimates which in turn depends on business research. Once sales forecasting is done, efficient production and investment programmes can be set up around which are grouped the purchasing and financing plans. Research, thus, replaces intuitive business decisions by more logical and scientific decisions.

***Research is equally important for social scientists in studying social relationships and in seeking answers to various social problems*.** It provides the intellectual satisfaction of knowing a few things just for the sake of knowledge and also has practical utility for the social scientist to know for the sake of being able to do something better or in a more efficient manner. Research in social sciences is concerned both with knowledge for its own sake and with knowledge for what it can contribute to practical concerns. “This double emphasis is perhaps especially appropriate in the case of social science. On the one hand, its responsibility as a science is to develop a body of principles that make possible the understanding and prediction of the whole range of human interactions. On the other hand, because of its social orientation, it is increasingly being looked to for practical guidance in solving

immediate problems of human relations." In addition to what has been stated above, the significance of research can also be understood keeping in view the following points:

(a) To those students who are to write a master's or Ph.D. thesis, research may mean careerism or a way to attain a high position in the social structure;

(b) To professionals in research methodology, research may mean a source of livelihood;

(c) To philosophers and thinkers, research may mean the outlet for new ideas and insights;

(d) To literary men and women, research may mean the development of new styles and creative work;

(e) To analysts and intellectuals, research may mean the generalisations of new theories.

Thus, research is the fountain of knowledge for the sake of knowledge and an important source of providing guidelines for solving different business, governmental and social problems. It is a sort of formal training which enables one to understand the new developments in one's field in a better way.

Criteria of Good Research

Whatever may be the types of research works and studies, one expects scientific research to satisfy the following criteria:

1. The purpose of the research should be clearly defined and common concepts be used.

2. The research procedure used should be described in sufficient detail to permit another researcher to repeat the research for further advancement, keeping the continuity of what has already been attained.

3. The procedural design of the research should be carefully planned to yield results that are as objective as possible.

4. The researcher should report with complete frankness, flaws in procedural design and estimate their effects upon the findings.

5. The analysis of data should be sufficiently adequate to reveal its significance and the methods of analysis used should be appropriate. The validity and reliability of the data should be checked carefully.

6. Conclusions should be confined to those justified by the data of the research and limited to those for which the data provide an adequate basis.

7. Greater confidence in research is warranted if the researcher is experienced, has a good reputation in research and is a person of integrity.

1. *Good research is systematic:* It means that research is structured with specified steps to be taken in a specified sequence in accordance with the well defined set of rules. Systematic characteristic of the research does not rule out creative thinking but it certainly does reject the use of guessing and intuition in arriving at conclusions.

2. *Good research is logical:* This implies that research is guided by the rules of logical reasoning and the logical process of induction and deduction are of great value in carrying out research. Induction is the process of reasoning from a part to the whole whereas deduction is the process of reasoning from some premise to a conclusion which follows from that very premise. In fact, logical reasoning makes research more meaningful in the context of decision making.

3. *Good research is empirical:* It implies that research is related basically to one or more aspects of a real situation and deals with concrete data that provides a basis for external validity to research results.

4. *Good research is replicable:* This characteristic allows research results to be verified by replicating the study and thereby building a sound basis for decisions.

TYPES OF RESEARCH

The basic types of research are as follows:

(i) Descriptive vs. Analytical Research

Descriptive research includes surveys and fact-finding enquiries of different kinds. The major purpose of descriptive research is description of the state of affairs as it exists at present. In social science and business research we quite often use the term ***Ex post facto research*** for descriptive research studies. The main characteristic

of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening. Most ex post facto research projects are used for descriptive studies in which the researcher seeks to measure such items as, for example, frequency of shopping, preferences of people, or similar data. Ex post facto studies also include attempts by researchers to discover causes even when they cannot control the variables. The methods of research utilized in descriptive research are survey methods of all kinds, including comparative and correlational methods. **In *analytical research***, the researcher has to use facts or information already available, and analyze these to make a critical evaluation of the material.

(ii) Applied vs. Fundamental Research

Research can either be applied (or action) research or fundamental (to basic or pure) research. **Applied research** aims at finding a solution for an immediate problem facing a society or an industrial/business organisation, whereas **fundamental research** is mainly concerned with generalisations and with the formulation of a theory. "Gathering knowledge for knowledge's sake is termed 'pure' or 'basic' research." Research concerning some natural phenomenon or relating to pure mathematics are examples of fundamental research. Similarly, research studies, concerning human behaviour carried on with a view to make generalisations about human behaviour, are also examples of fundamental research, but research aimed at certain conclusions (say, a solution) facing a concrete social or business problem is an example of applied research. Research to identify social, economic or political trends that may affect a particular institution or the copy research (research to find out whether certain communications will be read and understood) or the marketing research or evaluation research are examples of applied research. Thus, the central aim of applied research is to discover a solution for some pressing practical problem, whereas basic research is directed towards finding information that has a broad base of applications and thus, adds to the already existing organized body of scientific knowledge.

(iii) *Quantitative vs. Qualitative:*

Quantitative research is based on the measurement of quantity or amount. It is applicable to phenomena that can be expressed in terms of quantity. **Qualitative research**, is concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind. For instance, when we are interested in investigating the reasons for human behaviour (i.e., why people think or do certain things), we quite often talk of 'Motivation Research', an important type of qualitative research. This type of research aims at discovering the underlying motives and desires, using in depth interviews for the purpose. Other techniques of such research are word association tests, sentence completion tests, story completion tests and similar other projective techniques. Attitude or opinion research i.e., research designed to find out how people feel or what they think about a particular subject or institution is also qualitative research. Qualitative research is especially important in the behavioural sciences where the aim is to discover the underlying motives of human behaviour. Through such research we can analyse the various factors which motivate people to behave in a particular manner or which make people like or dislike a particular thing. It may be stated, however, that to apply qualitative research in practice is relatively a difficult job and therefore, while doing such research, one should seek guidance from experimental psychologists.

(iv) ***Conceptual vs. Empirical:***

Conceptual research is that related to some abstract idea(s) or theory. It is generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones. On the other hand, **empirical research** relies on experience or observation alone, often without due regard for system and theory. It is data-based research, coming up with conclusions which are capable of being verified by observation or experiment.

We can also call it as experimental type of research. In such a research it is necessary to get at facts firsthand, at their source, and actively to go about doing certain things to stimulate the production of desired information. In such a research, the researcher must first provide himself with a working hypothesis or guess as to the probable results. He then works to get enough facts (data) to prove or disprove his hypothesis. He then sets up experimental designs which he thinks will manipulate the

persons or the materials concerned so as to bring forth the desired information. Such research is thus characterised by the experimenter's control over the variables under study and his deliberate manipulation of one of them to study its effects. Empirical research is appropriate when proof is sought that certain variables affect other variables in some way. Evidence gathered through experiments or empirical studies is today considered to be the most powerful support possible for a given hypothesis.

(v) ***Some Other Types of Research:***

All other types of research are variations of one or more of the above stated approaches, based on either the **purpose of research, or the time required** to accomplish research, **on the environment** in which research is done, or on the basis of some other similar factor. Form the point of view of time, the research either as ***one-time research or longitudinal research*****.** In the former case the research is confined to a single time-period, whereas in the latter case the research is carried on over several time-periods. Research can be ***field-setting research or laboratory research or simulation research,*** depending upon the environment in which it is to be carried out. Research can as well be understood as ***clinical or diagnostic research*****.** Such research follow case-study methods or in depth approaches to reach the basic causal relations. Such studies usually go deep into the causes of things or events that interest us, using very small samples and very deep probing data gathering devices. The research may be *exploratory* or it may be formalized. The objective of exploratory research is the development of hypotheses rather than their testing, whereas formalized research studies are those with substantial structure and with specific hypotheses to be tested. ***Historical research*** is that which utilizes historical sources like documents, remains, etc. to study events or ideas of the past, including the philosophy of persons and groups at any remote point of time. Research can also be classified as ***conclusion-oriented*** and ***decision-oriented.*** While doing **conclusion oriented research**, a researcher is free to pick up a problem, redesign the enquiry as he proceeds and is prepared to conceptualize as he wishes. ***Decision-oriented research*** is always for the need of a decision maker and the researcher in this case is not free to embark upon research according to his own inclination. Operations research is an example of decision oriented research since it is a scientific method of

providing executive departments with a quantitative basis for decisions regarding operations under their control.

RESEARCH DESIGN

A research design is the plan or framework used to conduct a research study. It involves outlining the overall approach and methods that will be used to collect and analyze data in order to answer research questions or test hypotheses.

According to Kerlinger :

"Research design is the plan, structure, and strategy of investigation conceived so as to obtain answers to research questions and to control variance".

Features of a Good Research Design

Objectivity :

Objectivity refers to the ability of the research instruments to give conclusions that are free from observer's personal biases. A good research design should be able select those instruments only that provide objective conclusions. Usually, it is believed that maintaining objectivity is pretty easy, but it proves to be difficult during execution of research and data analysis.

Reliability :

Another essential feature of a good research design is the reliability of responses. The instruments used in research should be able to provide similar responses to a question asked from a respondent. If the response varies, the instrument is considered unreliable. In other words, reliability of research design is measured in terms of consistency in responses.

Validity :

An important characteristic of a good research design is its ability to answer the questions in the way it was intended to. It should focus on the objective of the research and make specific arrangements or plan for achieving that objective.

Generalisability :

A research design is said to be generalisable if the outcome of the research is applicable on a bigger population from which the sample is selected. A research design can be made generalisable by properly defining the population properly, selecting the sample carefully, analyzing the statistical data appropriately, and by preparing it methodologically.

Therefore, the more the outcomes are generalisable, more efficient is the research design.

Sufficient Information:

Any research is conducted to gain insight of the hidden facts, figures and information. The research design should be able to provide sufficient information to the researcher so that he can analyse the research problem in a broad perspective. The research design should be able to identify the research problem and research objective.

Importance of Research Design

Reduces Cost :

Research design is needed to reduce the excessive costs in terms of time, money and effort by planning the research work in advance.

Facilitate the Smooth Scaling :

In order to perform the process of scaling smoothly, an efficient research design is of utmost importance. It makes the research process effective enough to give maximum relevant outcome in an easy way.

Helps in Relevant Data Collection and Analysis :

Research design helps the researchers in planning the methods of data collection and analysis as per the objective of research. It is also responsible for the reliable research work as it is the foundation for entire research. Lack of proper attention in preparation of research design can harm the entire research work.

Assists in Smooth Flow of Research Operations :

Research design is necessary to give better and effective structure to the research. Since all the decisions are made in advance, therefore, research design facilitates the smooth flow of research operations and reduces the possible problems of researchers.

Helps in Getting Reviews from Experts :

Research design helps in developing an overview about the whole research process and thus assists in getting responses and reviews from different experts in that field.

Provides a Direction to Executives :

Research design directs the researcher as well as the executives involved in the research for giving their relevant assistance.

Factors Affecting Research Design

Various factors that affect research design are as follows :

Research Questions :

Research questions perform an important role in selecting the method to carry-out research. There are various forms of research designs which include their own methods for collecting data.

Time and Budget Limits :

Researchers are bound with restricted amount of time and budget to complete the research study. The researcher can select experimental or descriptive research when the time and budget constraints we favorable to him for the detailed study. otherwise exploratory research design can be adopted when the time is limited.

Research Objective :

Every research is carried out to obtain the results which help to achieve some objectives. This research objective influences the selection of research design. Researcher should adopt the research design which is suitable for research objective and also provides best solution to the problem along with the valuable result.

Research Problem :

Selection of the research design is greatly affected by the type of research problems. **For example,** the researcher selects experimental research design to find out cause and-effect relationship of the research problem. Similarly, if the research problem includes in depth study, then the researcher generally adopts experimental research design method.

Personal Experiences :

Selection of research design also depends upon the personal experience of researchers. **For example,** the researcher who has expertise in statistical analysis would be liable to select the quantitative research designs. While, those researchers who are specialists in theoretical facets of research will be forced to select qualitative research design.

Target Audience :

The type of target audience plays very important role in selection of research design. Researcher must consider the target audience for which the research is carried-out. Audiences may either be general public, business professionals or government. **For example,** if the research is proposed for general public, then the researcher should select qualitative research design. Similarly, quantitative research design would be appropriate for the researcher to introduce the report in front of the business experts.

HYPOTHESIS

INTRODUCTION

A hypothesis is a formal tentative statement of the expected relationship between two or more variables under study. A hypothesis helps to translate the research problem & objectives into a clear explanation or prediction of the expected results or outcomes of the research study.

A clearly stated hypothesis includes the variables to be manipulated or measured, identifies the population to be examined, & indicates the proposed outcome for the study.

DEFINITION

"Hypothesis is a tentative prediction or explanation of the relationship between two variables. It implies that there is a systematic relationship between an independent & a dependent variable".

Good & Hatt defined "Hypothesis as a shrewd guess or inference that is formulated & provisionally adopted to explain observed facts or conditions & to guide in further investigation".

IMPORTANCE OF HYPOTHESIS IN RESEARCH

- Hypotheses enables the researcher to objectively investigate new areas of discovery. Thus, it provides a powerful tool for the advancement of knowledge.
- Hypotheses provides objectivity to the research activity. It also provides directions to conduct research such as defining the sources & relevance of data.
- Hypotheses provides clear & specific goals to the researchers. These clear & specific goals provide the investigator with a basis for selecting sample & research procedures to meet these goals.
- Hypotheses provides link between theories & actual practical research.
- It provides a bridge between theory & reality.
- A hypothesis suggests which type of research is likely to be most appropriate. As it is a tentative statement of anticipated results, it guides the researcher towards the direction in which the research should proceed.
- It stimulates the thinking process of researcher as the researcher forms the hypothesis by anticipating the outcome.
- It also determines the most appropriate research designs & techniques of data analysis.
- Hypotheses provides understanding to the researchers about what expect from the results of the research study.

- It serves as framework for drawing, conclusions of a research study. Without hypotheses, research would be like aimless wandering.

CHARACTERISTICS OF GOOD HYPOTHESIS

Conceptual clarity:

Hypothesis should consist of clearly defined & understandable concepts. It should be stated in very terms, the meaning & implication of which cannot be doubted. To facilitate the conceptual clarity, hypothesis can be stated in declarative statement, in present tense.

Empirical referents:

Research must have an ultimate empirical referent. No usable hypothesis can embody moral judgments. A good hypothesis must have empirical basis from the area of enquiry.

Objectivity:

Hypothesis must be objective, which facilitates objectivity in data collection & keeps the research activity free from researcher value - judgment.

Specificity:

It should be specific, not general, & should explain the expected relations between variables. For example, regular yoga reduces stress.

Relevant:

The hypothesis should be relevant to the problem being studied as well as the objectives of the study. Hypothesis must have relevance with theory under test in a research process.

Testability:

Hypothesis should be testable & should not be a moral judgment. It must be directly/indirectly observable & measurable. The researcher can set up a situation that permits one to assess if it is true or false. It must be verifiable. For example, a statement such as ‘bad partners produce bad children’. This sort of hypothesis cannot be tested.

Consistency:

A hypothesis should be consistent with an existing body of theories, research findings, & other hypotheses. It should correspond with existing knowledge.

Simplicity:

A hypothesis should be formulated in simple & understandable terms. It should require fewer conditions & assumptions.

Availability of techniques:

The researchers must make sure that methods are available for testing their proposed hypotheses

Purposiveness:

The researcher must formulate only purposeful hypotheses, which has relevance with research problem & objectives.

Verifiability:

A good hypothesis can be actually verified in practical terms.

Profundity of effect:

A good hypothesis should have profound effect upon a variety of research variables.

Economical:

The expenditure of money & the time can be controlled if the hypotheses underlying the research undertaken is good.

SOURCES OF HYPOTHESIS

Theoretical or conceptual frameworks

The most important sources of hypotheses are theoretical or conceptual frameworks developed for the study. Through a deductive approach these hypotheses are drawn from theoretical or conceptual frameworks for testing them. For example, Roy's adaptation Model is used in a research study, where a hypothesis can be drawn from a concept of the theoretical mode that 'patient's adaptation to a chronic illness depends on availability of social support for them.'

Previous Research

Findings of the previous studies may be used for framing the hypotheses for another study. For example, in a small sample descriptive study, a researcher found that a number of patients admitted with coronary artery disease had increased body mass index.

Real-Life Experiences

Real-life experiences also contribute in the formulation of hypotheses for research studies. For example, Newton had a life-changing experience of the falling of an apple & formulated a hypothesis that earth attracts all the mass towards its centre, through several researchers were conducted before generating a law of central gravity.

Academic Literature

Academic literature is based on formal theories, empirical evidences, experiences, observation, & conceptualizations of academicians. These literatures may serve as good sources for formulating hypotheses for research studies**.**

TYPES OF HYPOTHESIS

Simple & Complex Hypothesis

Simple Hypothesis:

- It is a statement which reflects the relationship between two variables.
- For example, 'the lower the level of hemoglobin, the higher is the risk of infection among postpartum women'.

Complex Hypothesis:

- It is a statement which reflects the relationship between more than two variables.
- For example, 'satisfaction is higher among patients who are older & dwelling in rural area than those who are younger & dwelling in urban area'.

Associative & Causal Hypothesis

Associative Hypothesis:

- It reflects a relationship between variables that occurs or exists in natural settings without manipulation.

Causal Hypothesis:

- It predicts the cause-and-effect relationship between two or more dependent & independent variables in experimental or interventional setting, where independent variable is manipulated by research to examine the effect on the dependent variable.
- The causal hypothesis reflects the measurement of dependent variable to examine the effect of dependent variable, which is manipulated by the researcher.

Directional & Non Directional Hypothesis

Directional Hypothesis:

- It specifies not only the existence, but also the expected direction of the relationship between variables.
- Directional hypothesis states the nature of the relationship between two or more variables such as positive, negative, or no relationship.
- To express the direction of relationship between variables, the directional terms are used to state the hypothesis such as positive, negative, less, more, increased, decreased, greater, higher, lower, etc.
- For examples, 'there is a positive relationship between years of nursing experience & job satisfaction among nurses.

Non-Directional Hypothesis:

- It reflects the relationship between two or more variables, but is does not specify the anticipated direction & nature of relationship such as positive or negative.
- It indicates the existence of relationship between the variables.

Null & Research Hypothesis:

Null Hypothesis :

- It is also known as statistical hypothesis & is used for statistical testing & interpretation of statistical outcomes.
- It states the existence of no relationship between theindependent & dependent variables.

Research Hypothesis :

- It states the existence of relationship between two or more variables.
- For examples, 'there is relationship between smoking & incidence of lung cancer.

METHODS OF DATA COLLECTION

INTRODUCTION:

There are various methods of collecting data are employed by social scientists. The task of data collection begins after a research problem has been defined and research design /plan chalked out.

TYPES OF DATA

1) PRIMARY DATA : Are those which are collected a fresh and for the first time and thus happen to be original in character and known as Primary data.

2) SECONDARY DATA : Are those which have been collected by someone else and which have already been passed through the statistical process are known as Secondary data.

COLLECTION OF PRIMARY DATA:

There are several methods of collecting primary data, particularly in surveys and descriptive researches. In descriptive research, we obtain primary data either through observation or through direct communication with respondents in one form or another or through personal interviews.

COLLECTION OF SECONDARY DATA:

These are already available i.e. they refer to the data which have already been collected and analyzed by someone else. Secondary data may either be published or unpublished data. Researcher must be very careful in using secondary data, because the data available may be sometimes unsuitable.

METHODS OF PRIMARY DATA COLLECTION :

OBSERVATION METHOD :

- Observation method is a method under which data from the field is collected with the help of observation by the observer or by personally going to the field.
- In the words of P.V. Young, "Observation may be defined as systematic viewing, coupled with consideration of seen phenomenon."

Advantages:

- Subjective bias eliminated (No bias information)
- Information researcher gets is Current information
- Independent to respondent's variable (as in interview and may be bias)

Disadvantages :

- It is expensive method (Time requires more)
- Limited information
- Unforeseen factors may interfere with observational task
- Respondents opinion cannot be recorded on certain subject

Types of Observation:

Structured and Unstructured Observation

- When observation is done by characterizing style of recording the observed information, standardized conditions of observation , definition of the units to be observed , selection of pertinent data of observation then it is structured observation
- When observation is done without any thought before observation then it is unstructured observation

Participant & Non Participant Observation

- When the Observer is member of the group which he is observing then it is Participant Observation
- In participant observation Researcher can record natural behavior of group , Researcher can verify the truth of statements given by informants in the context of questionnaire , Difficult to collect information can obtain through this method but in this researcher may lose objectivity of research due emotional feelings.
- When observer is observing people without giving any information to them then it is non participant observation

Controlled & Uncontrolled Observation:

- When the observation takes place in natural condition i.e. uncontrolled observation.
- It is done to get spontaneous picture of life and persons

- When observation takes place according to definite pre arranged plans, with experimental procedure then it is controlled observation generally done in laboratory under controlled condition.

INTERVIEW METHOD:

This method of collecting data involves presentation or oral-verbal stimuli and reply in terms of oral-verbal responses. This is Oral Verbal communication. Where interviewer asks questions (which are aimed to get information required for study) to respondents.

Personal Interview : The interviewer asks questions generally in a face to face contact to the other person or persons.

Merits of Personal Interview:

- Information at greater depth
- Flexibility of restructuring the Questionnaire
- Interviewer by his skill can come over resistance
- Non Response generally low
- Samples can controlled more effectively
- Personal information can be obtained by the Interviewer and can collect supplementary information about respondent's personal characteristics and environment which has value in interpreting results.

Demerits of Personal Interview:

- Supervisors have to do complex work of selecting, training and supervising the field staff.
- Systematic errors may be occurred
- Takes more time when samples are more
- Some Executive people are not approachable so data collected may be inadequate
- Respondent may give bias information
- It is an Expensive method as compared to telephone interview method.

TELEPHONIC INTERVIEWS:

- Contacting samples on telephone
- Uncommon method may be used in developed regions

Merits

- Flexible compare to mailing method
- Faster than other methods
- Cheaper than personal interview method
- Call-backs are simple and economical also
- High response than mailing method, when it is not possible to contact the respondent directly, then interview is conducted through telephone.
- Replies can be recorded without embarrassment to respondents
- Interviewer can explain requirements more easily
- No field staff is required
- Wider distribution of sample is possible

Demerits

- Little time is given to respondents
- Survey is restricted to respondents who have telephones
- Not suitable for intensive survey where comprehensive answers are required
- Bias information may be more
- It is very difficult to make questionnaire because it should short and to the point

QUESTIONNAIRE METHOD:

This method of data collection is quite popular, particularly in case of big enquiries. The questionnaire is mailed to respondents who are expected to read and understand the questions and write down the reply in the space meant for the purpose in the questionnaire itself. The respondents have to answer the questions on their own

Merits of Questionnaire

- Low cost even the geographical area is large to cover
- Answers are in respondents own word so, free from bias

- Adequate time to think for answers
- Non approachable respondents may be conveniently contacted
- Large samples can be used so results are more reliable

Demerits of Questionnaire

- Low rate of return of duly filled questionnaire
- It Can be used when respondent is educated and co operative
- It is inflexible ,omission of some questions by the respondents
- Difficult to know the expected respondent have filled the form or it is filled by someone else
- It is slowest method of data collection

Essentials of Good Questionnaire

- Questionnaire Should Short & simple
- Questions should arranged in logical sequence (From Easy to difficult one)
- Technical terms should avoided
- Some control questions which indicate reliability of the respondent (To Know consumption first expenditure and then weight or qty of that material)
- Questions affecting the sentiments of the respondents should be avoided
- Adequate space for answers should be provided in questionnaire

How to Construct a Questionnaire:

Researcher should note the following with regard to these three main aspects of a questionnaire:

- General form
- Question Sequence
- Determine the type the Questions
  - Direct Question
  - Indirect Question
  - Open Form Questionnaire
  - Closed Form Questionnaire
  - Dichotomous Questions

- Multiple Choice Questions (MCQ)

SCHEDULE METHOD:

- It is one of the important methods for the study of social problems.
- Schedules like Questionnaires but it filled by enumerator.
- Enumerators are specially appointed for filling questionnaire
- Enumerators explain the aim and objective to respondent and fill the answers in provided space

Other Methods of Data Collection

Warranty Cards:

- Post card size cards sent to customers and feedback collected through asking questions on that card.
- Distributor or Store Audits, Audits are done by distributor or manufacturer's salesperson. Observation or copying information about inventory in retail shops.
- Useful method for knowing market share, market size , effect of in store promotion.

Pantry Audits:

- From the observation of pantry of customer to know purchase habit of the people (which product, of what brand etc.)
- Questions may be asked at the time of audit

Consumer Panels:

- When pantry audit is done at regular basis, Daily record of consumption of certain customers, or repeatedly interviewed at the specific periods to know their consumption.
- Transitory consumer panels – for limited time Continuing Consumer panel for indefinite period

Use of Mechanical Device:

- **Eye Cameras:** To record eyes focus on certain sketch
- **Psycho Galvanometer:** To measure body excitement to visual stimulus
- **Motion Picture Camera:** To record movement of body at the time of purchase

SECONDARY SOURCES OF DATA:

- Publications of Central, State, Local Government, Technical and Trade journals.
- Books, Magazines, Newspaper• Reports & publications of industry, bank, stock exchange.
- Reports by research scholars, Universities and economists.

Factors to be considered before using secondary data

- Reliability of data – Who, when, which methods, at what time etc.
- Suitability of data – Object ,scope, and nature of original inquiry should be studied, as if the study was with different objective then that data is not suitable for current study
- Adequacy of data– Level of accuracy, area differences then data is not adequate for study

Selection of proper Method for collection of Data:

- Nature ,Scope and object of inquiry
- Availability of Funds
- Time Factor
- Precision Required

RESEARCH PROBLEM

INTRODUCTION TO RESEARCH PROBLEM

- A research problem is a question that researcher wants to answer or a problem that a researcher wants to solve
- Identification & formulation of a research problem is the first step of the research process.
- It is like the identification of a destination before under taking a journey
- Without a problem , research cannot proceed because there is nothing to proceed to ward.

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- Research problem may take a number of forms , from the very simple to the very complex

Research Topic:

The broad general area expected to investigate. It is a broad idea or concept from which many problems may be delineated.

Research Problem:

A situation or circumstance that requires a solution to be described, explained, or predicted. It is an unsatisfactory situation that wants you to confront.

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DEFINITION

- According to *Kerlinger*, 'A problem is an interrogative sentence or statement that asks what relation exists between two or more variable. The answer to question will provide what is having sought in the research.
- Research problem is a "statement of the disparity between what is known and what needs to be known"

SELECTION OF RESEARCH PROBLEM

- Any research problem does exist if the following condition are in existence:-

1. There must be an individual or a group or an organization having different types of environment.
2. There must be at lest two course of action is defined by one or more values of the controlled variable.

FORMULATION OF RESEARCH PROBLEM

SELECTION OF A RESEARCH AREA:

- Formulation of a research problem begins with selection of a broad research topic from personal experience, literature, previous research, & theories in which researcher is interested & has significance for library profession.
- For example, a researcher gets an idea to conduct a study on the Impact of library internship on MLIS Student.
- Therefore, he or she initially begins with such broad research topic.

REVIEWING LITERATURE & THEORIES:

- After getting a broad idea for research, he or she needs to review the LISc. literature & theories.
- Literature is reviewed to know what has already been done in this selected areas of research.
- Review of library theories provides an opportunity for LISc researcher to plan a research problem to contribute towards.

DELIMITING THE RESEARCH TOPIC:

- In this step, researcher proceeds from a general area of interest to more specific topic of research to conduct a study.
- For example, initially a researcher decides to conduct a study 1.on Impact of library internship on MLIS Student; later in this stage researcher limits it to specific research topic '*a study on 2.perception of MLIS Students about impact on internship in Pondicherry university* '.
- In the 1st tropic specific area is not mentioned but in 2nd tropic specific area is mentioned Pondicherry University.

EVALUATING THE RESEARCH PROBLEM

- Once researcher is clear about the specific research problem, next the research problem must be carefully evaluated for its significance, researchability, & feasibility.
- Feasibility of the research problem should be evaluated for time, cost, availability of subjects & resources and researcher's interest.

FORMULATING FINAL STATEMENT OF RESEARCH PROBLEM

- After establishing the significance, researchability, & feasibility, then researcher finally formulates a final statement of a research problem.
- A statement of research problem could be in declarative or interrogative format

COUNT...

1.Declarative format:

In this format, a research problem is stated in declarative statement.

e.g.- impact of library internship on MLIS student of Pondicherry University.

2. ***Interrogative format:***

In interrogative format, a research problem is stated in question form.

e.g- "What is the Impact of library internship on MLIS Student of Pondicherry University ?"

BE KEPT IN MIND BY A RESEARCHER IN SELECTING A RESEARCH PROBLEM:

1. The subject on which research work has been overdue should not be chosen, because it will be a difficult task to throw any new light.
2. The problem should neither be too narrow nor too unclear.
3. The topic of the research should be familiar and feasible so that the researcher can easily access to related research materials or source.

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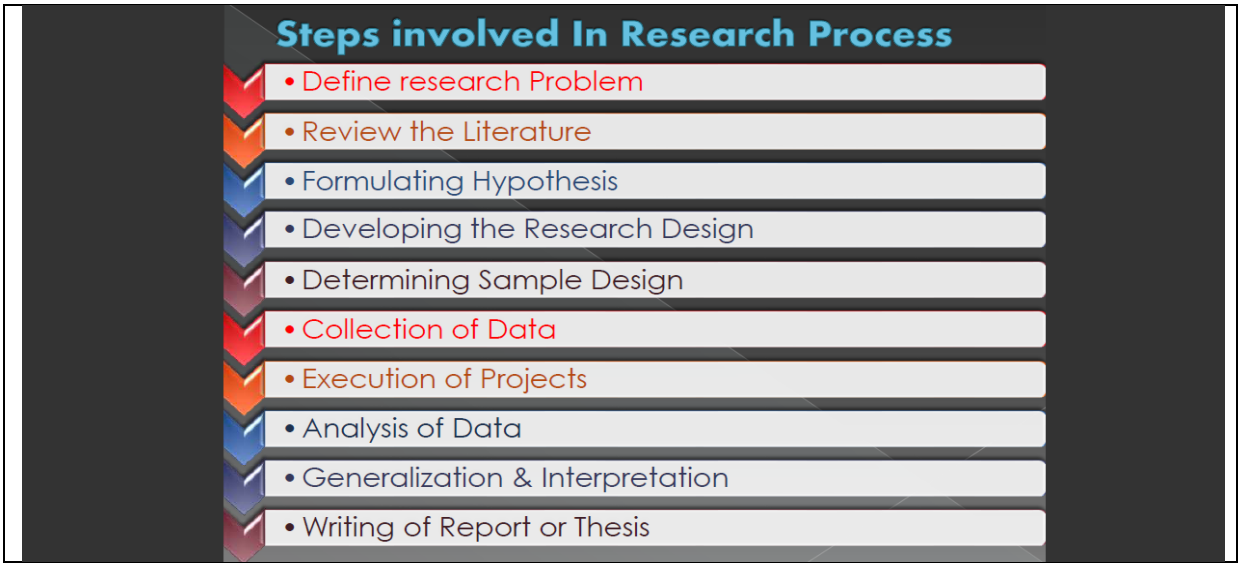
RESEARCH PROCESS



Define Research Problem - The 1st step in the Research Process is defined or redefining the study will be based. The research problem may be something the agency identifies as a problem, some knowledge or information that is needed by the agency. The researcher should understand the problem thoroughly & examine all available literature related to that problem.

Review the literature - Now that the problem has been defined, the researcher must learn more about the topic under investigation. To do this, the researcher must review the literature related to the research problem. This step provides foundational knowledge about the problem area. The review of literature also educates the researcher about what studies have been conducted in the past, how these studies were conducted, and the conclusions in the problem area.

Formulating Hypothesis - After Literature survey , researcher should state the working hypothesis in clear terms. Hypothesis should be very specific & limited to the piece of research because is has to be tested. The role of Hypothesis is to guide the researcher & keep him on the right track.

Developing the Research design- The Research Problem having being formulated . The researcher will be required to prepare a research design i.e. he will have to state the structure within which research will be conducted .The function of research design is to provide for the collection of relevant data with minimum expenditure of time, efforts & money.

Determining Sample design - A sample can be defined as a small piece of group. The researcher must decide the way of selecting a sample which is known as SAMPLE DESIGN. Sample can be of various types such as:-

i) Simple/Random Sampling
ii) Systematic Sampling
iii) Quota Sampling

Collection of Data- The actual study begins with the collection of data. The collection of data is a critical step in providing the information needed to answer the research question. Every study includes the collection of some type of data—whether it is from the literature or from subjects—to answer the research question.

Execution of Projects - Execution of projects is very important step as it requires correct lines, adequate & dependable matter.

Analysis of data – After the data has been collected, the researcher has the task of analysing them. The analysis of data requires a number of related operations such as; creating raw data through tabulation pie-charts, coding & then drawing statistical inferences.

Generalization & Interpretation – In this stage, hypothesis is compared by testing various statistical tools such as Chi-square test, F test, T test. Any test may be applied depending upon the nature & object of the research hypothesis. Testing will result in either accepting or rejecting the hypothesis.

Report Writing or Thesis – Finally the research has to prepare the report of what has been done by him, writing of report must be done with great care keeping in view the following points:-

The layout of the report should be in a proper format starting from the introduction which includes Title, Acknowledgement, Introduction, Data Analysis, Finding & Conclusions at the end of the report a list of books, journals, magazines, websites, etc. consulted during research work should be given in the Bibliography.

Causal Research Design

These designs tends to specify the nature of relationship between two or more variables present in the problem environment. This research design attempts to explore cause and affect relationships where causes already exist and cannot be manipulated.

RESEARCH REPORT

Once the researcher has completed data collection, data processing, developing and testing hypotheses, and interpretation of responses, the next important phase in research is the preparation of project/research report. Research report is very essential for the communication of research findings to its potential users.

The purpose of a research report is to communicate the findings and results of a research study or investigation. It serves as a formal document that presents the research process, methodology, analysis, and conclusions to a specific audience, such as researchers, academics, professionals, or decision-makers.

According to Lancaster, "A report is a statement of collected and considered facts, so drawn-up as to give a clear and concise information to persons who are not already in possession of the full facts of the subject matter of the report".

Purpose of Research Report

The objective of a research report is to present the findings of a research study in a structured and comprehensive manner. It serves several important purposes, including:

Communicating Research Findings:

The primary objective of a research report is to communicate the results of a research study to a specific audience, such as researchers, academics, professionals, or policymakers. It provides a detailed account of the research methodology, data analysis, and key findings, ensuring that the information is disseminated to the intended audience.

Providing a Record of the Research:

A research report serves as a documented record of the research process. It includes information about the research design, data collection methods, data analysis techniques, and any challenges or limitations encountered during the study. This record ensures that the research can be replicated, verified, or built upon by other researchers in the future.

Validating research outcomes:

Research reports undergo a peer review process, which involves evaluation by experts in the field. This process ensures the quality and validity of the research outcomes. The objective is to receive constructive feedback, address any concerns or weaknesses, and improve the research study before its publication.

Supporting evidence-based decision-making:

Research reports provide evidence and insights that can inform decision-making processes. Policymakers, professionals, and other stakeholders rely on research findings to

make informed decisions, develop strategies, or implement practices. By presenting the research outcomes in a clear and concise manner, the objective is to facilitate evidence-based decision-making in various fields.

Contributing to the knowledge base:

Research reports contribute to the existing body of knowledge in a particular field. By sharing research findings, methodologies, and insights, they expand the understanding and awareness of a subject or problem. The objective is to add to the collective knowledge and provide a foundation for further research and innovation.

Influencing policy and practice:

Well-conducted and well-documented research reports have the potential to influence policy development, practices, and societal changes. Policymakers and practitioners often rely on research reports to understand the implications of certain actions, evaluate the effectiveness of interventions, or propose new approaches. The objective is to have a real-world impact by influencing policy decisions and improving practices.

Procedure of Research Report

Revising expectation:

Before starting report writing, researcher should revisit the purpose of research and expectation from the researcher. If the researcher is intended to submit academic reports, minimum steps and format are well designed. Hence, researcher should identify the answer of some questions as:

- What is the objective of research?
- Is there any format of reports?
- Is there word limit?
- Who will read the report?
- What is the process of report evaluation? etc.

Answers of such questions help to make a good report.

Preparing outline:

On the basis of nature of data, objective of research, and requirement of the evaluating agency, researcher need to prepare outline i.e. roadmap to the research report. This helps to decide in how many chapters, in how many topics, whether descriptive or analytical report is required to prepare. In simple words, outline helps to arrange the idea before starting write up. It is the planning phase for the content of report for making it more effective. During this

phase, researcher should also plan the time frame within which a report is to be completed and submitted.

Arranging data:

On the basis of objectives, population and sample for the research, researcher collects the data from different sources. Different types of data are collected for the purpose. Such different data from different sources need to be processed and tabulated. Only relevant data are sequentially arranged so that right information will be obtained at the right time for the right purpose. For this different tables of data need to be prepared and named properly.

Preparing the first draft:

The report completed with a single effort may not be excellent. Thus, researcher should update and upgrade the report with series of revisions. For this purpose, the first draft is to be prepared and revisit the whole draft carefully. Add or remove the necessary descriptions, interpretations, and analysis as and when required.

Review and rewrite:

Every report consists of scope of some improvement. It is true that in each reading, you can find something to rewrite or rearrange. This makes the report more interesting and excellent. Thus, researcher must read and reread the draft again and again. During this course of action, you need to compare the report with format (if any specific format is required), methodological conformation, values and data revisit as there may be some misprints, if possible, language expert need to be consulted. After rewriting the drafts, the final draft will be prepared which can be submitted to the concern authority.

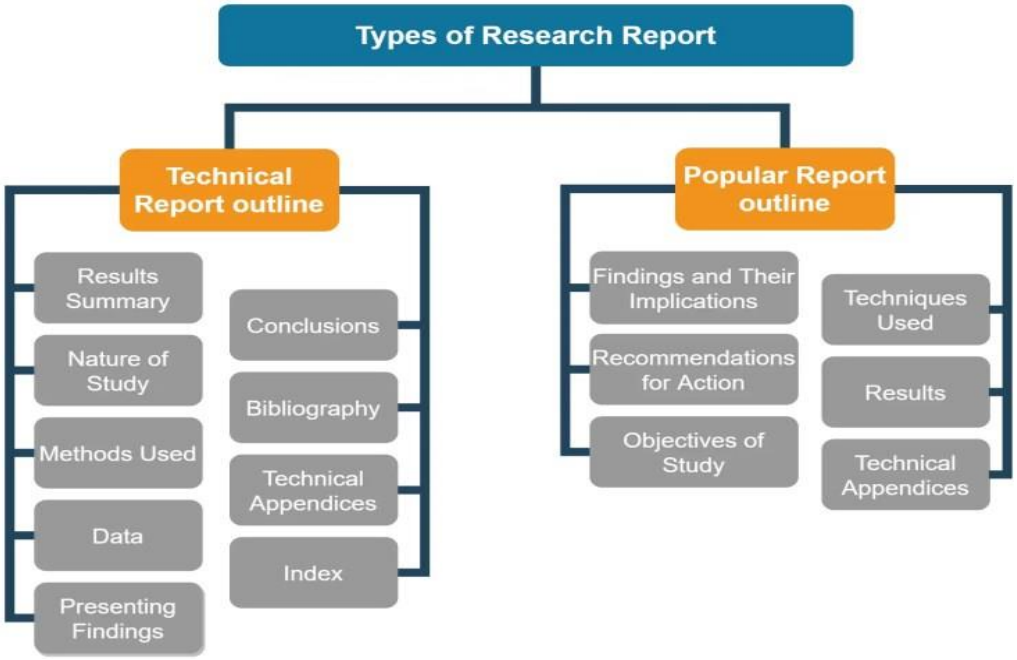
Points to be taken into consideration while writing a Research Report

Research report is a channel of communicating the research findings to the readers of the report. A good research report is one which does this task efficiently and effectively. As such it must be prepared keeping the following precautions in view:

- While determining the length of the report, one should keep in view the fact that it should be long enough to cover the subject but short enough to maintain interest.
- A research report should not be dull; it should be such as to sustain reader's interest.
- Abstract terminology and technical jargon should be avoided in a research report.

- Objective of the study, the nature of the problem, the methods employed and the analysis techniques adopted must all be clearly stated in the beginning of the report in the form of introduction.
- Readers are often interested in acquiring a quick knowledge of the main findings and as such the report must provide a ready availability of the findings. For this purpose, charts, graphs and the statistical tables may be used for the various results in the main report in addition to the summary of important findings.
- The layout of the report should be well thought out and must be appropriate and in accordance with the objective of the research problem.
- The reports should be free from grammatical mistakes and must be prepared strictly in accordance with the techniques of composition of report-writing such as the use of quotations, footnotes, documentation, proper punctuation and use of abbreviations in footnotes and the like.
- A research report should show originality and should necessarily be an attempt to solve some intellectual problem. It must contribute to the solution of a problem and must add to the store of knowledge.
- Appendices should be enlisted in respect of all the technical data in the report.
- Bibliography of sources consulted is a must for a good report and must necessarily be given.

Types of Research Report



Technical Report

Technical report is one that is needed where complete written report of research study is needed for the purpose of public dissemination or record-keeping. In this report, data is presented in a simple manner and key results are defined properly. Technical report emphasis on tools used in study, assumptions made and presentation of findings along with their limitation.

Outline of Technical report is: –

1. **Results Summary-** Description of key findings of the study conducted.
2. **Nature of Study-** Denotes objectives of study, formulating problem on operational basis, hypothesis used for working, type of data needed and kinds of analysis.
3. **Methods Used-** Tools and techniques used for carrying out the study along with their limitations is explained.
4. **Data-** Description of how the data was collected, what are their sources, their characteristics and limitations.
5. **Data Analysis and Presenting Findings-** It is the main body of report where data is analyzed and finding are presented along with supporting data. Distinct types of tables and charts are used for better explanation.
6. **Conclusions-** Findings are narrated in a detailed manner and implications of policies drawn from results is explained.
7. **Bibliography-** It provide details of distinct sources which were consulted while performing a research.
8. **Technical Appendices-** Technical appendices related to mathematical deviations, questionnaire and analysis technique elaboration.
9. **Index-** It is attached invariably at the report end.

Popular Report

Popular report is the one that focuses on attractiveness and simplification of data. It is used when its findings will have policy implications. Focus is laid on writing in a clear manner, minimization of technical aspects, using charts and diagrams in liberal and detailed manner. Other key characteristics of popular report are use of many subheadings, large prints and occasional cartoon. Practical emphasis is given more importance in these type of report.

General outline of Popular Report is as given below: –

1. **Findings and Their Implications-** Focus is given on practical aspects of findings of study conducted and how these findings are implied.
2. **Recommendations for Action-** This section of report on basis of findings provides recommendations for action.
3. **Objectives of Study-** A description of nature of problem and key objectives of conducting a study are explained here.
4. **Techniques Used-** Review of all tools and techniques employed along with data employed for concluding the study is given in this portion of study. All description is given in non-technical manner.
5. **Results-** It is the main portion of report where all finding are denoted in simplified and non-technical terms. All sorts of illustration like diagrams and charts are used liberally.
6. **Technical Appendices-** Technical appendices provides a detailed informed on different methods used, forms etc. In case, if report is meant for general public then technical appendices is kept precise.