Research Methodology

Research methodology is a collective term for the structured process of conducting research. There are many different methodologies used in various types of research and the term is usually considered to include research design, data gathering and data analysis. Research methodology seeks to inform: Why a research study has been undertaken, how the research problem has been defined, in what way and why the hypothesis has been formulated, what data have been collected and what particular method has been adopted, why particular technique of analysing data has been used and a host of similar other questions are usually answered when we talk of research methodology concerning a research problem or study.

Research methodologies can be quantitative (for example, measuring the number of times someone does something under certain conditions) or qualitative (for example, asking people how they feel about a certain situation). Ideally, comprehensive research should try to incorporate both qualitative and quantitative methodologies but this is not always possible, usually due to time and financial constraints. Research methodologies are generally used in academic research to test

hypotheses or theories. A good design should ensure the research is valid, i.e. it clearly tests the hypothesis and not extraneous variables, and that the research is reliable, i.e. it yields consistent results every time.

Part of the research methodology is concerned with the how the research is conducted. This is called the study design and typically involves research conducted using questionnaires, interviews, observation and/or experiments. The term research methodology, which prescribes the research method to use, usually encompasses the procedures followed to analyze and interpret the data gathered. These often use a range of sophisticated statistical analyses of the data to identify correlations or statistical significance in the results.

Objective, representative research can be difficult to conduct because tests can normally only be conducted on a small sample (e.g. you cannot test a drug on every person in the world so a sample needs to be used in research). This means that researchers need to have a very detailed understanding of the types and limitations of research methodologies which they are using.

In simple terms research methodology is used to give a clear cut idea on what the researcher is carrying out his or her research. In order to plan in a right point of time and to advance the research work, research methodology makes the right platform to the researcher to mapping out the research work in relevance to make solid plans. More over research methodology guides the researcher to involve and to be active in his or her particular field of enquiry. Most of the time, the aim of the research and the research topic won't be same at all time it varies from its objectives and flow of the research, but by adopting a suitable methodology this can be achieved.

Right from selecting the topic and carrying out the research, the research methodology drives the researcher in the right track. The entire research plan is based on the concept of right research methodology. More over through the research methodology the external environment constitutes the research by giving an in-depth idea on setting the right research objective, followed by literature point of view, based on that chosen analysis through interviews or questionnaires findings will be obtained and finally concluded message by this research.

The research methodology constitutes the internal environment by understanding and identifying the right type of research, strategy, philosophy, time horizon, approaches, followed by right procedures and techniques based on his or her research work. Additionally, the research

methodology acts as the nerve center because the entire research is bounded by it and to perform a good research work, the internal and external environment has to follow the right research methodology process.

The system of collecting data for research projects is known as research methodology. The data may be collected for either theoretical or practical research for example management research may be strategically conceptualized along with operational planning methods and change management. Some important factors in research methodology include validity of research data, ethics and the reliability of most of your work is finished by the time you finish the analysis of your data. This is followed by research design, which may be either experimental or quasi-experimental. The last two stages are data analysis and finally writing the research paper, which is organised carefully into graphs and tables so that only important relevant data is shown.

Importance of Research Methodology in Research

It is necessary for a researcher to design a research methodology for the problem chosen. One should note that even if the research method considered for two problems are same the research methodology may be different. It is important for the researcher to know not only the research methods necessary for the research under taken but also the methodology. For example, a researcher not only needs to know how to calculate mean, variance and distribution function for a set of data, how to find a solution of a physical system described by mathematical model, how to determine the roots of algebraic equations and how to apply a particular method but also need to know (i) which is a suitable method for the chosen problem?, (ii) what is the order of accuracy of the result of a method?, (iii) what is the efficiency of the method? And so on. Considerations of these aspects constitute a research methodology. More precisely, research methods help us get a solution to a problem. .

Research is a *structured enquiry that utilizes acceptable scientific methodology to solve problemsand create new knowledge that is generally applicable.*

Scientific methods consist of systematic observation, classification and interpretation of data.

Research is a process of collecting, analyzing and interpreting information to answer questions. But to qualify as research, the process must have certain characteristics: it must, as far as possible, be controlled, rigorous, systematic, valid and verifiable, empirical and critical.

- **Controlled** - in real life there are many factors that affect an outcome. The concept of control implies that, in exploring causality in relation to two variables (factors), you set up your studyin a way that minimizes the effects of other factors affecting the relationship.

- **Rigorous** - you must be scrupulous in ensuring that the procedures followed to find answers to questions are *relevant, appropriate and justified.* Again, the degree of rigor varies markedly between the physical and social sciences and within the social sciences.

- **Systematic** - this implies that the procedure adopted to undertake an investigation follow a certain logical sequence. The different steps cannot be taken in a haphazard way. Some procedures must follow others.

- **Valid and verifiable** - this concept implies that whatever you conclude on the basis of your findings is correct and can be verified by you and others.

- **Empirical** - this means that any conclusions drawn are based upon hard evidence gathered from information collected from real life experiences or observations.

- **Critical** - critical scrutiny of the procedures used and the methods employed is crucial to a research enquiry. The process of investigation must be foolproof and free from drawbacks. The process adopted and the procedures used must be able to withstand critical scrutiny.

For a process to be called research, it is imperative that it has the above characteristics.

Types of Research:

Research can be classified from three perspectives:

1. *application* of research study
2. *objectives in undertaking* the research
3. *inquiry mode* employed

Research Application:

From the point of view of application, there are two broad categories of research:

– *pure research* and
– *applied research.*

Pure research involves developing and testing theories and hypotheses that are intellectually challenging to the researcher but may or may not have practical application at the present time or in the future. *The knowledge produced through pure research is sought in order to add to the existing body of research methods.*

Applied research is done to solve specific, practical questions; for policy formulation, administration and understanding of a phenomenon. It can be *exploratory*, but is usually *descriptive*. It is almost always done on the basis of basic research. Applied research can be carried

out by academic or industrial institutions. Often, an academic institution such as a university will have a specific applied research program funded by an industrial partner interested in that program.

Research Objectives:

From the viewpoint of objectives, a research can be classified as:

- *descriptive*
- *correlational*
- *explanatory*
- *exploratory*

Descriptive research attempts to describe systematically a situation, problem, phenomenon, service or programme, or provides information about , say, living condition of a community, or describes attitudes towards an issue.

Correlational research attempts to discover or establish the existence of a relationship/ interdependence between two or more aspects of a situation.

Explanatory research attempts to clarify why and how there is a relationship between two or moreaspects of a situation or phenomenon.

Exploratory research is undertaken to explore an area where little is known or to investigate the possibilities of undertaking a particular research study (*feasibility study/pilot study).*