

RESEARCH METHODS;

Introduction

The managers of tomorrow will need to know more than any managers in history. Research will be a major contributor to that knowledge.

Managers will find knowledge of research methods to be of value in many situations.

Business research has an inherent value to the extent that it helps the management make better decisions.

Why Study Research

- It provides you with knowledge and skills you need to solve problems and meet the challenges of a fast-paced decision-making environment.
- Business research courses are recognition that students preparing to manage businesses, not-for-profit and public organization in all functional areas
- These factors stimulate an interest in a scientific approach to decision making.
- The business organization has evolved in response to the social and political mandates of natural public policy, explosive technology growth, and continuing innovations in global communications.
- These changes have created new knowledge needs for the Manager and new publics to consider when evaluating any decision.

Each of the factors listed below, which characterize the complex businesses decision-making environment, demands that managers have more and better information on which to base decisions.

- (i) There are more variables to consider in every decision
- (ii) More knowledge exists in every field of management.
- (iii) Global and domestic competition is more vigorous with many businesses downsizing to re-focus on primary competencies, reduce costs and make competitive gains.
- (iv) The quality of theories and models to explain tactical and strategic results is improving.
- (v) Government continues to show concern with all aspects of society, becoming increasingly aggressive protecting these various publics.
- (vi) Workers, shareholders, customers, and the general public are demanding to be included in company decision-making; they are better informed and more sensitive to their own self-interest than ever before.

- (vii) Organizations are increasingly practicing data mining, learning to extract meaningful knowledge from volumes of data contained within internal databases.
- (viii) Computer advances have allowed businesses to create the architecture for data warehousing, electronic storehouses where vast arrays of collected, integrated data are ready for mining.
- (ix) The power and ease of use of today's computer have given us the capability to analyze data to deal with today's complex managerial problems.
- (x) Techniques of quantitative analysis take advantage of increasingly powerful computing capabilities.
- (xi) The numbers and power of the tools used to conduct research have increased, commensurate with the growing complexity of business decisions.

Definition of Research and Business Research.

Kerlinger Fred N. has defined scientific research as a systematic, controlled, empirical and critical investigation of natural phenomena guided by theory and hypothesis about the presumed relations among such phenomena.

The terms systematic and controlled in this definition refer to the degree to which the observations are controlled and alternative explanations of the outcome are ruled out.

The terms empirical and critical permit to the requirements for the researcher to test subjective beliefs against objective reality and have the findings open to further scrutiny and testing. These qualities are what the author means by scientific.

C.C. Crawford defines research as a systematic and refined technology of thinking, employing specialized tools, instruments and procedures in order to obtain a more adequate solution to a problem.

Research can be defined as a careful and systematic means of solving a problem. It is a careful and systematic attempt to provide answers to questions and these answers may be abstract or general or highly concrete and specific.

Research is directed towards a specific area for the purpose of discovering, interpreting or applying facts, principles or theories.

As a scientific study, research calls for careful observations of phenomenon, recording and analyzing of data in order to reach sound and tenable conclusion on the basis of available evidence.

The systematic and scholarly application of scientific methods interpreted in its broadest sense to the solutions of business enterprises can be considered as business research.

Therefore business research can be defined as a systematic, scientific enquiry that provides information to guide business decisions. Business research could involve the study of human resource management, marketing research, entrepreneurship etc. for example, in

marketing research we could address issues pertaining to product image, advertising, sales promotions, packaging and branding , pricing, new product development.

Purposes of Research

- (i) Discover New Knowledge-It is the discovery of new facts, their correct interpretation and practical application. It remains the most efficient and reliable source of knowledge. It is the most accurate system of securing useful knowledge.
- (ii) Exploration-Much of social research is conducted to explore, to provide a beginning familiarity with that topic. This purpose is typically when a researcher is examining a new interest or when the subject of study is itself relatively new and unstudied.
- (iii) Description -it is to describe situations and events. Or to answer who, what, when, where and sometimes how. The researcher observes and then describes what was observed.
- (iv) Explanation- purpose is to know why events happen as opposed to simply describing what happened.
- (v) Prediction -is the ability to estimate phenomena A given B. if we can provide a plausible explanation of an event after it has occurred, it is desirable to be able to predict when and in what situations the event will occur.
- (vi) Involuntary Research-The researcher undertakes it as a result of external pressure to do so. e.g. Junior faculty members whose professional security or advancement may depend, in part, on scientific publications or College students who must undertake research to satisfy the requirement of a course in research method

Characteristics (Hallmarks of Scientific Research)

- (i) **Purpose** - a definite aim or purpose, i.e., it must be focused; otherwise it will fail to be systematic and directed. This statement of the purpose guides in the achievement of the research objectives.
- (ii) **Rigor**- it concerns carefulness and the degree of exactitude in research. A good theoretical base and a sound methodology would add such rigor to a purposive study. It involves a good theory base and a carefully thought out methodology, factors which enable the researcher to collect the right kind of information for an appropriate data analysis, arriving at valid conclusions.
- (iii) **Testability**-it is testing logically developed hypothesis to see whether or not the data supports the proposed hypothesis
- (iv) **Replicability** -the results of the research or the tests of the hypothesis should be supported again and again when the research is repeated in other similarly circumstances. It gives confidence in research design and hence makes it scientific.
- (v) **Precision** and -it refers to how close the findings on a sample are to the reality. It reflects the degree of exactitude of the results based on the sample to the phenomena studies on they exist in the universe or the actual population. The closer your results are to the expected or predicted phenomena the higher the precision.

- (vi) **Confidence**-it refers to the probability that our estimates are correct. It is not merely enough to be precise but that is important to be 95% sure or confident that our estimates are correct and that there is only a 5% chance of our being wrong.
- (vii) **Interpretation**-The conclusions drawn through the interpretation of the results of our data analysis should be objective and based on facts resulting from the actual data and not from our own subjective or emotional values.
- (viii) **Generalizability** -it refers to the (scope) of applicability of the research findings. The kind of instruments used in data collection and objectivity shown in the interpretation of data.
- (ix) **Parsimony** –it refers to the (scope) of applicability of the research findings. The wider the range of applicability of the solutions generated by research the more useful the research is.

TYPES OF RESEARCH

Classification of Research

In the fields of general education, health, education, physical education, recreation etc there exist different kinds of problems; consequently, different types of research are used to solve these problems. Research in general can be classified or categorized in many ways. The following are the basic modes of classification.

- (i) The field of study in which the research is conducted. I.e. discipline; for example educational research, sociological research, marketing research etc.
- (ii) The place where the research is conducted, hence we talk in forms of field research, laboratory research, community research etc.
- (iii) Application of the research – the way/mode in which the findings of the research will be used e.g., Action research, service research etc.
- (iv) Purpose of the research i.e. basic research, action research, applied research and evaluation research.
- (v) By methods of analysis, i.e., descriptive research and empirical research
- (vi) Character of data collected i.e. qualitative research and quantitative research.
- (vii) Procedure/Design used – experimental research, survey research etc.

Types of Research

1. Basic research

It is also referred to as pure or **fundamental research**. It is a type of research which characterized by desire to know or to expound the frontiers of knowledge. It is research based on the creation of new knowledge. It is mainly theoretical and for advancement of knowledge. Basic researchers are interested in deriving scientific knowledge which will be a broad base for further research. The main purpose for conducting this research is to

generate more information and understanding the phenomena that operate in a situation. The aim is not usually to apply findings, to solve an immediate problem but rather to understand more about a certain phenomena and expound that knowledge.

Another focus of basic research is to generate new knowledge in order to refine or expand existing theories. However, there is no consideration of the practical application of the findings to actual problems or situations. Such research does however often lead to further research of the practical nature and may in fact provide the very basis of this further research.

2. Applied Research

The type of research is conducted for the purpose of improving present practice. Normally applied research is conducted for the purpose of applying or testing theory and evaluating its usefulness in solving problems. Applied research provided data to support theory or suggested the development of new theories. It is the research conducted with the intention of applying the result of its finding to solve specific problems currently being experienced in an organization.

3. Action Research

This is a small scale intervention in the functioning of the real world and close examinations of the effects of such interventions. Action research is normally situational and it is concerned with diagnosing a problem in a specific context and attempting to solve it in that context.

Normally action research is conducted with the primary intention of solving a specific, immediate and concrete problem in a local setting. Action research is not concerned with whether the results of the study are generalized to other settings, since its major goal is to seek a solution to a given problem. Action research is limited in its contribution to theory, but it is useful because it provides answers to problems that cannot wait for theoretical solutions.

4. Descriptive Research

A descriptive study is undertaken in order to ascertain and be able to describe the characteristics of variables in a situation. Quite often descriptive studies are undertaken in organizations in order to learn about and describe characteristics of employees. E.g. Education level, job status, length of service etc. The most prevalent method of gathering information in a descriptive study is the questionnaire. Others include; interviews, job analysis, documentary analysis etc. descriptive statistics such as the mean, standard, deviation, frequencies, percentages are used in the analysis of descriptive research.

5. Correlation Research

Correlation research is descriptive in that it cannot presume a cause- and – effect relationship. It can only establish that there is an association between two or more traits

or performance. This involves collecting data to determine whether a relationship exist between two or more quantifiable variables. The main purpose of correlation research is to describe the nature of the relationship between the two variables. Correlation research helps in identifying the magnitude of the relationship. Many techniques have been devised to provide us with numerical representation of such relationship and these are known as measured of association. The most commonly used measures of association are two;

- (i) Pearson's product moment of coefficients
- (ii) Spearman's rank order correlation.

Correlation techniques are generally intended to answer 3 questions;

- (i) Is there a relationship between the two variables?
- (ii) If the answer is Yes, what is the direction of the relationship (nature of relationship) (+ or -)
- (iii) What is the magnitude of the relationship?

6. Casual Research

A casual study is one which is done to establish a definitive 'cause' relationship among variables. In this type of research, the researcher is keen to delineating one or more factors that are certainly causing the problem. The intention of the researcher conducting a casual study is to be able to state that variable X cause variable Y to change. A casual study is more effective in a situation where the researcher has already identified the cause of the problem. However, this type of a design is limiting in that quite often, especially in an organization, there are multiple cases of a problem which are linked to many factors i.e. Does a pay rise cause higher productivity.

7. Historical Research

This is the systematic and objective location and synthesis of evidence in order to establish facts and draw conclusions about past events. The act of historical involves the identification and limitation of a problem of an area of study which is based on past events. The researcher aims to:

- (i) Locate as many pertinent sources of information as possible concerning the specific problem.
- (ii) Then analyze the information to ascertain its authenticity and accuracy, and then be able to use it to generalize on future occurrences.

Historical research is important because:

- (i) It enables solutions to contemporary problems to be solved in the past.
- (ii) Historical research throws light on present and future trends.
- (iii) Historical research allows for the revelation of data in relation to select hypothesis, theories and generalizations that are presently held about the past.

Ability of history to employ the past, to predict the future and to use the present to explain the past gives historical research a dual and unique quality which makes exceptionally useful for all types of scholarly study and research.

8. Experimental Research

In experimental research, the investigator deliberately controls and manipulates the conditions which determine the events to which he is interested. It involves making a change in the value of one variable (the independent variable) and observing the effect of that change on another variable (the dependent variable). In experimental design, the independent variable is stimulus i.e., it is stimulated while the dependent variable is responsive

If all extraneous factors can be successfully controlled then the researcher can presume that changes in the dependent variable are due to the independent variable.

9. Longitudinal Studies

These are designed to permit observations over an extended period. For example, analyses of newspaper editorials overtime. Three special types of longitudinal studies should be noted here;

- (i) **Trend Studies:** are those that study changes within some general population over time. Three special types of longitudinal studies should be noted.
- (ii) **Cohort Studies;** examine more specific subpopulation (cohorts) as they change overtime. Typically, a cohort is an age group, such as those people during the 1920s, people who got married in 1964 and so forth. An example of cohort study would be a series of national surveys, conducted perhaps every ten years, to the study the economic attitudes of the cohort born during the early 1960s.

A sample of persons 20-25 years of age might be surveyed in 1970, another sample of those of those 30-35 years of age in 1970, and another sample of those 40-45 years of age in 1990. Although the specific set of people studied in each of these surveys would be different, each sample would represent the survivors of the cohort born between 1960 and 1964.

- (iii) **Panel Studies;** are similar to trend and cohort studies except that the same set of people is studied each time. One example would be a voting study in which the same sample of voters are interviewed every month during an election campaign and asked for whom they intended to vote for. Such a study would not only make it possible to analyze overall trends in voter preferences for different candidates, but would have the added advantage of showing the precise patterns of persistence and change in intentions.

Research problem

Criteria in selecting a research problem

The following factors should be considered while selecting a suitable research problem

1. Workability

- (i). Is your research study within the range of your resources and time constraining?

- (ii). Will you have access to the necessary data?
- (iii). Is there a reason to believe you can come up with an answer to the problem?
- (iv). Is the required methodology manageable and understandable?

2. Critical Mass

- (i). Is the problem with sufficient magnitude and scope to fulfill the requirements that motivate the study?
- (ii). Are there enough variables?

3. Interest

- (i). Are you interested in the problem area?
- (ii). Does it relate to your background? To your career? Interest?
- (iii). Will you learn useful skills from pursuing it?

4. Theoretical value

- (i). Does the problem fill a gap in the literature?
- (ii). Does it challenge previously held opinions?
- (iii). Will others recognize it's important?
- (iv). Will it contribute to the advancement of knowledge?
- (v). It is publishable?

5. Practical value

- (i). Will the solutions to the problem improve available knowledge?
- (ii). Are other researchers likely to be interested in the results?
- (iii). Will your own research skills be improved as results of the study?

4.3 Sources of Research Problems.

- (i). **Existing theory**- existing theory contains generalization and hypothesized principles which can be scientifically tested. Such tests can be done through the research process and this lead to the validation of such theories.
- (ii). **Existing literature**.-review of related literature such as textbook, articles, journals on the broad problem area can give the researcher a good background of basic information and an insight into various issues that can be studied.
- (iii). **Discussion with experts**- discussion on general topics in meetings, classes, seminars or conferences can be a good source of research problem. Such forums provide an opportunity to discuss critical issues on certain areas and the researcher can identify a researchable problem.
- (iv). **Previous research study** - previously research studies especially in the field of interest usually indicate areas of furthers research. A review of such studies provides the researchers with the opportunity to be able to build up on previously research.
- (v). **Replication** – this involves carrying out a research project that had been done previously. In this case, the problem and the procedure of the research are identical

to the study that was previously done. Replication therefore is done to find out whether findings hold.

- (vi). **The media**– issues which are frequently reported in the media can also from the basis of a research problem. Such issues are usually discussed in public forums and are important to the majority of the people.
- (vii). **Personal experience** – these can also be important sources of a research problem. Experiences usually lead to a clear conceptualization of the problem.

COMPONENTS OF RESEARCH PROBLEM

1. There must be an individual or group which has some difficulty or problem
2. There must be some objective (s) to be attained at.
3. There must be an alternative means or the course of action for obtaining the objectives that one wishes to attain.
4. There must remain some doubt in the mind of the researcher with regard to the selection of alternatives. This means the research must answer the question concerning the relative efficiency of the possible alternatives
5. There must be some environment(s) to which the difficulty pertains

RESEARCH PROCESS PROBLEMS

Some researchers are method-bound. They recast the research questions so it is amenable to their favorite methodology. Not all researchers are comfortable with experimental designs. The past reluctance of most social scientists to use experimental designs is believed to have retarded the development of scientific research in the social sciences. The availability of techniques is an important factor determining how research will be done or whether a given study can be done. Persons skilled in given techniques are too often blinded by their special competences.

Also, the existence of a pool of information or a database can distract a student or manager, seemingly reducing the need for other research. Modern management information systems are capable of providing massive volumes of data. One frequently hears, *'we should use the information we already have before collecting more'* Always remember that each field in a data base was originally created for a specific reason, a reason that may or may not be compatible with the question/problem facing the researcher. Our emphasis here is on information projects that tend to be non routine, non recurring and complex rather than on database management.

Again, not all questions are researchable, and not all research questions are answerable. To be researchable a question must be one for which observation or other data collection can provide the answer. Many questions cannot be answered on the basis of information alone. Even if a question can be answered by facts alone, it might not be researchable because procedures or techniques are inadequate.

Finally, in an organization setting, it is important to remember that a manager's motivations for seeking research are not always obvious. Managers might express a genuine need for specific information on which to base a decision. This is the ideal scenario for quality research. Sometimes however, a research study may not really be describable but is authorized anyway, chiefly because its presence may win approval for a certain manager's pet idea. At other times, research may be authorized as a measure of personal protection for a decision maker in case s/he is criticized later. In these less than ideal cases, the researcher may find it more difficult to win the manager's support for a sound research design.

Questions

- Clearly describe sources of research problems citing relevant examples
- Discuss the factors to consider while choosing a research problem.

Review of Relevant Literature

There is a need for the review of both theoretical and empirical literature. This is a necessary and indispensable part of the proposal. There are two schools of thought that have argued over literature review, which is basically about the detail or length this section should take.

One school of thought argues that one cannot write a comprehensive literature review if the proposal is required to be short- 10 to 20 pages. Therefore, the review should be short and focused on- highlighting key issues in the literature, what is the study for and what methodology will be used, how will it add to the existing literature (continuation of knowledge.)

The second school of thought argues that literature review be compressive and detailed. Such a detailed review will enable one to access if there enough information to go on and if the study problem is of any interest to people. Secondly, literature review must be done because it fulfills a requirement for all study procedures and it also gauges the importance of the proposal.

There are certain advantages of detailed review.

1. One is able to gain a good background about the field of study- one is able to gain facts about the topic and most important learn about the authoritative

authors/writers in that field. What ideas do these writers consider important – what are their main hypothesis- how they have defined the various concept and terms.

2. A detailed literature review also provides valuable information on the methodology used in the study of certain phenomena. One is able to analyze the various methods used by various writers and from this consider which is best going to suit the topic chosen. Again all these methodologies have their requirements i.e. special skill or computer equipment) which one may not have and thus one is able to choose the methodology which is available given one's technical skills.
3. Detailed literature review will enable us ascertain whether the study is needed and timely. Is the area of any interest to require further research? Therefore, one is able to get valuable clues from literature review.
4. Detailed literature review enables one to pinpoint the critical issues – refine the problem statement.
5. Detailed literature review helps one to generate hypothesis and questions for further study.

Generally, recent studies published in recent journals are an important source of getting information about the current 'burning issues' in the subject. The journals also provide information about the current professional in the area and what they have said about the issue/subject. One is able to know about the most 'cited articles', because these are articles which are considered authoritative in their field of inquiry.

Not all journals are equally good. The quality of the journal is very important. The journal must contain articles that have been written by authoritative authors. Who have specialized in certain field? One should be able to know about the qualifications of the writers by checking through the editorial board.

Besides recent articles, one should be able to read books on the topic of stud. Some books do contain seminal work in certain topics. Four kinds of works should be scanned through for information.

- i) journals
- ii) dissertation abstract
- iii) Major books in the field
- iv) Electronic material/ computerized information banks

In summary, such information centers should provide information on the evolution and the present state of the study topic. They should provide justification for providing additional information to existing knowledge and also advance knowledge. One should

select only those studies that are related to the study topic. If nothing is related directly to your study topic, then select those that come close to it. Take time to review how they relate to the study and how do they differ significantly from the study.

Choose the most recent literature and method, and other works that are considered seminal.

Discuss the selected study in detail so that a non- specialized can understand the study. Briefly explain how the study relates to your problem and how yours differ from those you have reviewed. If you are aware of concurrent studies, cite them if possible.

Questions

Describe the various sources of literature review.

Discuss the importance of reviewing both empirical and theoretical literature

RESEARCH DESIGN

This is the design of the research project, also known as the “research design”. It is answering the questions what, where, when, how much, by what means a study will be conducted. A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.

It is the conceptual structure within which research is conducted; it is the blueprint for the collection, measurement and analysis of data. As such the design includes an outline of what the researcher will do from writing the hypothesis or formulating the research questions and its operational implications to the final analysis of data. In designing a study the following questions are important

- a) What is the study about?
- b) Why is the study being made?
- c) Where will the study be carried out?
- d) What type of data is required?
- e) Where can the required data are found?
- f) What periods of time will the study include?
- g) What will be the sample design?
- h) What techniques of data collection will be used?
- i) How will the data be analyzed?
- j) In what style will the report be prepared?

The need for a good design

- a) To facilitates the smooth sailing of the various research operations, to making research as efficient as possible yielding maximal information with minimal expenditure of resources.
- b) It is a blueprint or a map or a plan in advance of data collection and analysis for our research project.
- c) it is advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used in their analysis, keeping in consideration the objective of the research and the availability of staff, time and money.
- d) It is a firm foundation of the entire process of the research work.
- e) The design helps the researcher to organize his ideas in a form whereby it will be possible for him to look for flaws and inadequacies.
- f) It gives others for their comments and critical evaluation. In the absence of such a course of action, it will be difficult for the critic to provide a comprehensive review of the proposed study.

Features of a good design

A good design should be flexible, appropriate, efficient; economical among others .The design should minimize bias and maximize the reliability of the data collected and analyzed. The design which gives the smallest experimental error is supposed to be the best design in many investigations. Similarly, a design which yields maximal information and provides an opportunity for considering many different aspects of a problem is considered most appropriate and efficient design in respect of many research problems. Thus, the question of good design is related to the purpose or objective of the research problem and also with the nature of the problem to be studied. A design may be quite suitable in one case, but may be found wanting in one respect or the other in the context of some other research problem. One single design cannot serve the purpose of all types of research problems.

In designing a study the following should be considered:

- a) the means of obtaining information;
- b) the availability and skills of the researcher and his staff, if any;
- c) the objective of the problem to be studied;
- d) the nature of the problem to be studied; and
- e) The availability of time and money for the research work.

Classification of designs

Early in any research study one faces the task of selecting the specific design to use. A number of different approaches have been used but unfortunately there is no simple classification system that defines all the variations that must be considered. We are going to use eight descriptors that illustrate nature and contribution of designs to research.

Degree of research question crystallization

A study may be viewed as **formal or exploratory**. The essential distinction between the two options is the degree of structure and immediate objective of the study. Exploratory studies tend towards loose structures with objective of discovering future research tasks. The immediate purpose of exploration is usually to develop research questions or hypotheses for future research.

Formal study begins where exploration leaves off. It begins with a hypothesis or a research question and involves research procedures that are precise with data source specifications. The goal of a formal research design is to test the hypotheses or answer research questions. Exploratory- formal design dichotomy is less precise than other classifications. All studies have elements of exploratory on them and few studies are completely uncharted.

Method of data collection

This classification distinguishes between **monitoring and interrogative / communication processes**. The former includes studies in which the researcher inspects the activities of a subject or nature of some material without attempting to elicit responses from any one.

In the interrogative /communicative study the researcher questions the subjects and collects their responses by personal and impersonal means. The collected data may result from interview or telephone conversation, self administered or self reported instrument sent through mail left in convenient place or transmitted electronically or by other means. An instrument can be presented before and/or after a treatment or stimulus condition or an experiment.

Researcher control of variables

In term of researcher's ability to manipulate variables we differentiate between **experimental and ex post facto designs**. In an experiment the researcher attempts to control and/or manipulate the variables in a study. It is enough that we can cause variables to be changed or held constant in keeping with our research objectives. Experimental is appropriate when one wishes to discover whether certain variables produce effect on other variables. Experimental provides the most powerful support for hypothesis of causation.

With the ex post facto, investigators have no control over variables in the sense of being able to manipulate them. They can only report what has happened or what is happening. It is important that the researcher using this design not to influence the variables as to do so he introduces some bias. The researcher is limited to holding factors constant by judicious selection of subject according to strict sampling procedures and by statistical manipulation of findings.

The purpose of the study

The essential difference between the **descriptive and causal studies** lies in their objectives. If research is concerned with finding out who, what, when, or how much? Then the study is descriptive. If it is concerned with learning why that is how one variable produces changes in another it is causal. In a causal design we try to explain relationships among variables.

The time dimensions

Cross-sectional studies are carried out once and represent a snapshot of one point in time. **Longitudinal studies** are repeated over a period of time. The advantage of longitudinal study is that it tracks changes over time. It is a satisfaction measurement taken continuously over several months and reported monthly. In longitudinal studies of the panel variety, the researcher may study the same people over time.

While longitudinal study is important the constraint of budget and time impose the need for cross-sectional analysis.

The topical scope

The **statistical study** differs from **case study** in several ways. Statistical studies are designed for breadth rather than the depth. The attempt is to capture population characteristics by making inferences from sample's characteristics. Hypotheses are tested quantitatively. Generalizations about findings are presented based on the representativeness of the sample and validity of the design.

Case studies place more emphasis on full contextual analysis of fewer events or conditions and their interrelations. Although hypotheses are often used the reliance on qualitative data makes support or rejection more difficult. An emphasis in detail provides valuable insight for problem solving, evaluation and strategy. This detail is secured from multiple sources of information. It allows for evidence to be verified and avoids missing data. Although case studies have been maligned as scientifically worthless because they do not meet minimal design requirements for comparison they have significant scientific role. It is known as those important scientific propositions have the form of universals and universal can be falsified by a single counter instance. A well-designed case study can provide a major challenge to a theory and provide a source of new hypothesis and constructs simultaneously.

Research environment Designs also differ as to why they occur under actual environmental conditions (**field condition**) or under staged or manipulated conditions (**laboratory**)

To simulate is to replicate the essence of a system or process. Simulations are increasingly used in research, especially in operation research. The major characteristics of various conditions and relationships in actual situation are often represented in mathematical models. Role playing and other behavioral activities may be view as simulations