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MOUNT KENYA UNIVERSITY

DISTANCE LEARNING MODULE

FOR

BBM/SBC 323

BUSINESS RESEARCH METHODS

Course Content

Introduction to research; basic research methods, meaning of research, purpose of research, types of research, identification of a research problem, abstract, statement of research problem, Literature review;

Field research, desk research, data collection and tabulation, tools of statistical analysis
Sampling data; rationale for sampling, applicability of sampling, types of sampling, limitations of sampling

Data collection and techniques; introduction to data collection techniques, data collection techniques, critique of data collection techniques, Source of data, introduction to sources of data, primary sources, secondary sources, critique of the primary and secondary sources of data

Data analysis; data handling, data processing, data analysis, reporting, use of research results
Writing research reports, dissertations and thesis, information dissemination

Teaching / Learning Methodologies:
Lectures and tutorials; group discussion; demonstration; Individual assignment; Case studies

Instructional Materials and Equipment:
Projector; test books; design catalogues; computer laboratory; design software; simulators

Course Assessment
Examination - 70%; Continuous Assessment Test (CATS) - 20%; Assignments - 10%; Total - 100%

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TOPIC ONE

INTRODUCTION TO RESEARCH:

OBJECTIVES

At the end of the chapter, a student should be able to:

- Understand why research is studied
- Appreciate the value of acquiring research skills
- Define the terms – research and business research
- State and explain the purpose of research
- Explain the nature of scientific research
- Explain what is good research
- Describe the various classes of research
- Describe the various types of research

1.0 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. Interesting information about consumers, employers or competitors might be pleasant to have but its value is limited if the information cannot be applied to a critical decision. If a study does not help the management to select more efficient, less risky, or more profitable alternatives than otherwise would be the case, its use should be questioned. The important point is that research in a business environment finds its justification in the contribution it makes to the decision maker's task and to the bottom line.

At the minimum, one objective of this study material is to make you a more intelligent consumer of research products prepared by others, as well as be able to do quality research for your own decisions and those of others to whom you report.

1.1 Why Study Research

The study of research methods 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 organizations in all functional areas – need training in a disciplined process for conducting an inquiry related to a management dilemma. These factors stimulate an interest in a scientific approach to decision making:

- The Manager's increased need for more and better information
- The availability of improved techniques and tools to meet this need, and
- The resulting information overload if disciplined is not employed in the process

During the last two decades, we have witnessed dramatic changes in the business environment. Emerging from a historically economic role, 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. Other knowledgeable demands have arisen from problems with mergers, trade policies, protected markets, technology transfers, and macroeconomic savings – investment issues.

The trend toward complexity has increased the risk associated with business decisions, making it more important to have a sound information base. Each of the factors listed below, which characterize the complex business decision-making environment, demands that managers have more and better information on which to base decisions:

- There are more variables to consider in every decision.
- More knowledge exists in every field of management
- Global and domestic competition is more vigorous, with many businesses downsizing to re-focus on primary competencies, reduce costs and make competitive gains.
- The quality of theories and models to explain tactical and strategic results is improving.
- Government continues to show concern with all aspects of society, becoming increasingly aggressive in protecting these various publics.
- 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.
- Organizations are increasingly practicing **data mining,** learning to extract meaningful knowledge from volumes of data contained within **internal databases**.
- 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.
- 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.
- Techniques of quantitative analysis take advantage of increasingly powerful computing capabilities.
- The number and power of the tools used to conduct research have increased, commensurate with the growing complexity of business decisions.

To do well in such an environment, you will need to understand how to identify quality information and to recognize the solid, reliable research on which your high-risk decisions as a Manager can be based. You also will need to know how to conduct such research. Developing these skills requires understanding of scientific method as it applies to the managerial decision making environment. This study material addresses your needs as an information processor.

The value of Acquiring Skills

You can profit by having research skills in at least seven situations:

a. As a decision maker (Manager) you will often feel the need for more information before selecting a course of action. Your options are limited if there is no one to whom you can delegate this task. You either make an initiative judgment without gathering additional information, or you gather the data yourself with some reasonable level of skill. Gathering information may involve data mining existing databases and information sources or collecting new information. At the early levels of your career in management, when your experience is limited and your initiative judgment less reliable, it should be obvious which option is better.

b. In a second instance, you could be called to do a research study for a higher-level executive. Such a task often coming early in your career can be seen as a career-boosting opportunity, it can be the chance to make a favorable impression on that Executive.

c. The third scenario has you buying research services from others or evaluating proposals for research prepared by others. If you understand the research design proposed and adequately judge the quality of the planned activities and the likelihood that such activities will assist you in making a decision you can save your Organization both time and money.

d. Because much decision making relies on using information collected during prior research projects, with research skills you will be able to become a more discriminating consumer of the information given by research consultants or information contained in research journals.

e. Research can also enable you to sense, spot and deal with problems before they become serious. It will enable you to identify the specific factors that are behind an existing problem.

f. Knowledge in research methods enhances the sensitivity of a manager to the multidimensional nature of issues affecting the organization. This enables him/her to avoid inappropriate simplistic notions of one variable causing another. Eg. Motivation involves much more just raising the salaries for employees.

g. Another reason to study research methods is so that you may establish a career as a research specialist. As a specialized function, research offers attractive career opportunities especially in financial analysis, marketing research, operations research, public relations and human resource management. Job opportunities for research specialists exist in all fields of management and in all industries.

1.2 Meaning 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 technique of thinking, employing specialized tools, instruments and procedures in order to obtain a more adequate solution to a problem.

Generally speaking, 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 broadcast 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 encampus 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.

How scientific is Business Research?
The development of scientific method in business research lags behind similar developments in the physical sciences. Physical scientists have been more vigorous in their concepts and research procedures. They are much more advanced in their theory development than business scientists. The public domain has sponsored much physical research, some of it for hundreds of years.

Governments have allocated billions of dollars to support such research, driven by motivation to overcome disease or to improve the human condition. Nations driven by threat of war and national pride have also played a major role in the advance of physical science. Much of the findings of their research are in the public domain.

Business research is of much more recent origin and is largely supported by business organizations that hope to achieve a competitive advantage. Research methods and findings cannot be patented, and sharing findings often results in a loss of competitive advantage; "The more valuable the research result is, the greater the value in keeping it secret." Under such conditions, access to findings is obviously restricted. Even though there is a growing amount of academic business research it receives meager support when compared to research in the physical sciences.

Business research operates in a less favorable environment in other ways too. Physical research is normally conducted under controlled laboratory conditions, business research seldom is. Business research normally deals with topics such as human attitudes behavior, and performance. People think they already know a lot about these topics and do not really accept research findings that differ from their opinions.

Even with these hindrances, business researchers are making great strides in the scientific arena. New techniques are being developed, and vigorous research procedures are advancing rapidly. Computers and powerful analytical methods have contributed to this movement but a greater understanding of the basic principles of sound research is more important.
One outcome of these trends is that research-based decision making will be more widely used in the future than it has been in the past. Managers who are not prepared for this change will be at a severe disadvantage.

1.3 Purposes of Research

a) Discover new Knowledge

The main purpose of research is to discover new knowledge. This involves the discovery of new facts, their correct interpretation and practical application. Although there are other sources of knowledge, research remains the most efficient and reliable source of knowledge. It is the most accurate system of securing useful knowledge. Quite often, a scientist will take an interest in a topic without having any other clear ideas about what to expect in the way of relationship among variables. Initially, the relevant variables are not even clear. The initial research, infact may have the identification of important variables on its primary purpose.

b) **Exploration**

Much of social research is conducted to explore a topic, 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.

Example, let's suppose that widespread taxpayer dissatisfaction with the Government erupts into a tax payer's revolt. People begin refusing to pay their taxes and they organize themselves around that issue. You might want to learn more about the movement. How widespread is it? What levels and degrees of support are there within the community? How is the movement organized? What kinds of people are active in it? You might undertake an exploratory study to obtain at least appropriate answers to some these questions.

Exploratory studies are also appropriate in the case of more persistent phenomena. Perhaps a college student is unhappy with the college's dormitory regulations and wants to work towards changing them. Exploratory studies are more typically done for three purposes:

1. To satisfy the researcher's curiosity and desire for better understanding
2. To test the feasibility of undertaking a more careful study; and
3. To develop the methods to be employed in a more careful study.

c) Description

A major purpose of many studies is to describe situations and events. Descriptive studies try to discover answers to the questions; *who, what, when, where and sometimes how*. The researcher observes and then describes what was observed. A census is an excellent example of descriptive social research. The goal of the census is to describe accurately and precisely a wide variety of characteristics of a population, as well as the population of smaller areas such as towns and rural councils. Other examples of descriptive studies are the computation of age-sex profiles of population done by demographers and the computation of crime rates for different towns. A poll conducted during a political election campaign has the purpose of describing the voting intentions of the electorate.

d) Explanation

Reporting the voting intentions of an electorate is a descriptive activity, but reporting why some people plan to vote for candidate A and others for candidate B is an explanatory activity, as reporting why some towns have higher crime rates that others.

A researcher has an explanatory purpose is if he/she wishes to know why a student's demonstration ended in a violent confrontation with police, as opposed to simply describing what happened.

e) Prediction

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. For example, the aviation industry may be interested in explaining the radiation risks for flight crews and passengers from the sun and stars. The variables might include attitude, proximity or air routes to the poles, time of year and aircraft shielding. Perhaps the relations among the four variables explain the radiation risk variable. This type of study often calls for a high order of inference making. Why, for example would a flight at a specified attitude at one time of the year not produce so great a radiation risk to the airliner's occupants as the same flight in another season? The answer to such a question would be valuable in planning air routes.

f) Involuntary research

The researcher undertakes it as a result of external pressure to do so. There are two major categories:

- Junior faculty members whose professional security or advancement may depend, in part, on scientific publications; and
- College students who must undertake research to satisfy the requirements of a course in research methods.

Characteristics (hallmarks of scientific research)

The main distinguishing characteristics of scientific research include:

i) Purposiveness

Any good scientific research must have a definite aim or purpose, ie, it must be focused; otherwise it will fail to be systematic and directed. A statement of the purpose of study guides in the achievement of the research objectives, a practical research design and valid reliable results. Without such a focus it will be difficult for the research to achieve its objectives or test hypothesis.

ii) Rigor

A good theoretical base and a sound methodology would add rigor to a purposive study, Conclusions drawn from an investigation that lacks a good theoretical foundation would be unscientific. Therefore, rigorous research 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

Scientific research blends itself to testing logically developed hypothesis to see whether or not the data supports the proposed hypothesis.

This means that the hypothesis must be developed after a careful study of the problem.

Hypothesis is tested by applying certain statistical tests to the data collected for that purpose. If the hypothesis developed is not quite testable, it weakens a scientific investigation. This happens

when the variables developed are too abstract and difficult to measure or observe ie personality, obedience, understanding, job interest, commitment, tempremence etc.

iv) Replicability

Replicability in scientific research cohorts that the results of the research or the tests of the hypothesis should be supported again and again when the research is repeated in other similar circumstances, the Replicability gives confidence in our research design and hence makes it scientific.

v) Precision and confidence

Precision refers to how close the findings based on a sample are to the reality. Precision reflects the degree of exatitude 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.

Confidence refers to the probability that our estimates are correct. It is not merely enough to be precise but that it 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. This is also known as the confidence level that given perfection we would like to be 100% correct, imaging that if you have too much error for someone who has to take a rocket to the moon, then your research leaves a lot to be desired.

The narrower the gap within which we can estimate the range of our predictions, and the greater the confidence we have in our research results, the more useful and scientific the findings become. Precision and confidence can therefore be obtained by only appropriate scientific sampling designs.

vi) Objectivity

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. The more objective the interpretation of the data, the more scientific the research investigation

vii) Generalisability

This 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. Generalisability will depend on how elaborate the sampling design was. The kind of instruments used in data collection and objectivity shown in the interpretation of data.

viii) Parsimony

This refers to the simplicity of explaining the phenomena or problems that occur and in the applications of solutions to the problems. Being simple in explaining the outcomes of the research is always preferred to complex research frameworks that consider an imaginable number of factors. Being scientific does not mean that we have to be complicated, we come up with too many variables that cannot be analyzed and thus end up making the whole research invalid.

Characteristics of good research

Good research generates dependable data, being derived by practices that are conducted professionally that can be used reliably for management decision making. Good research differs from poor research that is carelessly planned and conducted resulting in data that a manager can't use to reduce his or her decision-making risks. Good research follows the standards of the scientific methods. These include:

i) Purpose clearly defined

The purpose of the research the problem involved or the decision to be made should be clearly defined and sharply delineated in terms as unambiguous as possible. The statement of the decision problem should include its scope, limitations and precise specifications of the meanings of all words and terms significant to the research. Failure of the researcher to do this adequately may raise legitimate doubts in the minds of research report readers as to whether the researcher has sufficient understanding of the problem to make a sound proposal to attack it. This characteristic is comparable to developing a strategic plan before developing a tactical plan or an action map for achieving an objective.

ii) Research process detailed

The research procedures used should be described in sufficient detail to permit another researcher to repeat the research. Except when secrecy is imposed, research reports should reveal with candor the sources of data and the means by which they were obtained. Omissions of significant procedural details make it difficult or impossible to estimate the validity and reliability of the data and justifiably weaken the confidence of the reader in the research and any recommendations based on the research. This characteristic is comparable to developing a tactical plan.

iii) Research design thoroughly planned

The procedural design of the research should be carefully planned to yield results that are as objective as possible. When a sampling of the population is involved the report should include evidence concerning the degree of representatives of the sample. A survey of opinions or recollections ought not to be used when more reliable evidence is available from documentary sources or by direct observation.

Bibliographic searches should be as thorough and complete as possible. Experiments should have satisfactory controls. Direct observations should be recorded in writing as soon as possible after the event. Efforts should be made to minimize the influence of personal bias in selecting and recording data. This characteristic is comparable to developing detailed action plans for each tactic.

iv) High ethical standards applied

Researchers often work independently and have significant latitude in designing and executing research projects. A research design that includes safeguards against causing mental or physical harm to participants and makes data integrity a first priority should be highly valued. Ethical issues in research reflect important moral concerns about the practice of responsible behavior in society. Researchers frequently find themselves precariously balancing the rights of their subjects against the scientific dictates of their chosen method. When this occurs, they have a responsibility to guard the welfare of the participants in the studies, and also the organizations to which they belong, their clients, colleagues and themselves.

Careful consideration must be given to research situations when there is a possibility for physical or psychological harm, exploitation, invasion of privacy, and loss of dignity. The research need must be weighed against the potential for adverse effects. Typically you can redesign a study, but sometimes you cannot. The researcher should be prepared for this dilemma.

v) Limitations frankly revealed

The researcher should report, with complete frankness, flaws in procedural design and estimate their effect on the findings. There are very few perfect research designs. Some of the imperfections may have little effect on the validity and reliability of the data. Others may invalidate them entirely. A competent researcher should be sensitive to the effects of imperfect design and his or her experience in analyzing the data should provide a basis for estimating their influence. As a decision maker, you should question the value of research where no limitations are reported.

vi) Adequate analysis for decision makers need

Analysis of the data should be sufficiently adequate to reveal its significance and the methods of analysis is used should be appropriate. The extent to which this criterion is met is frequently a good measure of the competence of the researcher. Adequate analysis of the data is the most difficult phase of research for the novice. The validity and reliability of data should be checked carefully. The data should be classified in ways that assist the researcher to reach pertinent conclusions and clearly reveal the findings that lead to those conclusions. When statistical

methods are used the probability of error should be estimated and the criteria of statistical significance applied.

vii) Findings presented unambiguously

Language that is restrained clear and precise; assertions that are carefully drawn and hedged with appropriate reservations and an apparent effort to achieve maximum objectivity tend to leave a favorable impression of the researcher with the decision maker. Generalizations that outrun the evidence on which they are based, exaggerations and unnecessary verbiage tend to leave an unfavorable impression. Such reports are not valuable to managers wading through the minefields of business decision making. Presentation of data should be comprehensive easily understood by the decision maker, and organized so that the decision maker can readily locate critical findings.

viii) Conclusions justified

Conclusions should be confined to those justified by the data of the research and limited to those of which the data provided an adequate basis. Researchers are often tempted to broaden the basis of induction by including personal experiences and their interpretations- data not subject to the controls under which the research data were gathered.

Equally undesirable is all too frequent practice of drawing conclusions from a study of a limited populations and applying them universally. Researchers may also be tempted to rely too heavily on data collected in a prior study and use it in the interpretation of a new study. Such a practice is sometimes prevalent among research specialists who confine their work to clients in a small industry. These actions tend to decrease the objectivity of research and weaken confidence in the findings. Good researchers always specify the conditions under which their conclusions seem to be valid.

ix) Researcher's experience reflected

Greater confidence in the research is warranted if the researcher is experienced, has a good reputation in research, and is a person of integrity. Were it possible for the reader of a research report to obtain sufficient information about the researcher, this criteria perhaps would be one of the best bases for judging the degree of confidence a piece of research warrants and the value of any decision on which it rests. For this reason, the research report should contain information about the qualifications of the researcher.

Table 1 SUMMARY

CHARACTERISTICS OF A GOOD RESEARCH	WHAT ONE SHOULD LOOK FOR IN RESEARCH DONE BY OTHERS OR INCLUDE IN SELF-DIRECTED RESEARCH
Purpose clearly defined	Research problem clearly stated
Research process detailed	Researcher provides complete research proposal
Research design thoroughly planned	Exploratory procedures are outlined with constructs defined. Sample unit is clearly described along with sampling methodology Data collection procedures are selected and designed.
Limitations frankly revealed	Desired procedure is compared with actual procedure in report Desired sample is compared with actual sample in report Impact in findings and conclusions are detailed.
High ethical standards applied	Safeguards are in place to protect study participants, organizations, clients and researchers. Recommendations do not exceed the scope of the study The study's methodology and limitations sections reflect researcher restraint and concern for accuracy.
Adequate analysis for decision maker's needs	Sufficient detailed findings are tied to collection instruments
Findings presented unambiguously	Findings are clearly presented in words, tables and graphs Findings are logically organized to facilitate reaching a decision about the manager's problem Executive summary of conclusions is outlined Detailed table of contents is tied to the conclusions and findings presentation.
Conclusions justified	Decision-based conclusions are matched with detailed findings
Researcher's experience reflected	Researcher provides experience/credentials with report

The Manager – Researcher relationship

Information gathering is an integral part of any manager's job. So it is not surprising that many managers do their own research at least part of the time. The lower a manager is in the decision-making hierarchy the more likely he/she is to do most of her or his own research. When managers lack either research time or talent, they may delegate the task to a staff assistant or a research specialist. This delegation of responsibility can result in greater synergy especially if the research decision driven and each party make a full contribution to the joint venture. However, the separation of research user from research conductor can pose problems in data analysis, interpretation, conclusion finding and recommendations. This is why businesses that regularly use outside research specialists often use the same firm repeatedly: knowledge of the

company, its people and its processes is as critical on knowledge of the decision-making dilemma.

In an organizational setting, the researcher should look on the manager as a client. An effective working relationship between researcher and manager is not achieved unless both fulfill their respective obligations and several critical barriers are overcome.

a) Manager-Researcher Contribution

The obligations of mangers are to specify their problems and provide researchers with adequate background information and access to company information gatekeepers. It is usually more effective if managers state their problems in terms of the decision choices they must make rather than specify the information they think they need. If this is done, both manager and researcher can jointly decide what information is needed.

Meru manufacturer's customer affairs manager Beldina Juma as a staff rather than a line manager may need assistance from managers with line responsibilities to define those plausible actions that could affect post purchase service. She has clearly been charged with the responsibility to execute the customer satisfaction study, but she does not have authority to implement conclusions affecting for example, product engineering, product manufacture or distributor relationships. Thus she needs to clarify with those line managers what courses of action might be taken to correct identified problems. If, however, dissatisfaction is arising because of how customers with questions are treated when interacting with the customer affair staff, Beldina has direct line authority to determine plausible actions to correct such problems within her own domain.

Researchers also have obligations. Organizations expect them to develop a creative research design that will provide answers to important business questions. Not only should researchers provide data analyzed in terms of the problems specified, but they also should point out the implications that flow from the results. In the process, conflict may arise between what the decision maker wants and what the researcher can provide or thinks should be provided. The decision maker wants certainity and simple explicit recommendations, while the researcher often can offer only probabilities and hedged interpretations. This conflict is inherent in their respective roles and has no simple resolution. However, a workable balance can usually be found in each person is sensitive to the demands and restrictions imposed on the other.

b) Manager-Researcher conflicts

Some conflicts between decision makers and researchers are traced to management's limited exposure to research. Managers' seldon have either formal training in research methodology or research expertise gained through experience. And, due to the explosive growth of research technology in recent years, a knowledge gap is developed between managers and research specialists as model building and more sophisticated investigative techniques have come into

use. Thus the research specialist removes the manager from his or her comfort zone. The manager must now put his or her faith and sometimes career in the hands of research specialists and hope for the best.

In addition, managers often see research people on threats to their personal status. Managers will view management on the domain of the 'intuitive artist' who is the master of this area. They may believe a request for research assistance implies they are inadequate to the task. These fears are often justified. The researcher's function is to test old ideas as well as new ones. To the insecure manager, the researcher is a potential rival.

The researcher will inevitable have to consider the corporate culture and political situations that develop in any Organization. Members strive to maintain their niches and may seek ascendancy over their colleagues. Coalitions form and people engage in various self-serving activities, both overt and covert. As a result, research is blocked or the findings or objectives of the research are distorted for an individual's self-serving purpose. To allow one's operations to be probed with a critical eye maybe to invite trouble from others competing for promotion, resources or other forms of organizational power.

A fourth source of stress for researchers is their frequent isolations from managers. Researchers draw back into their speciality and talk among themselves. Management's lack of understanding of research techniques compounds this problem. The research department can become isolated; reducing the effectiveness of conclusions a researcher may draw from research findings.

These problems have caused some people to advocate the use of a research generalist: such a person would head the research activity, help managers detail their research needs, and translate these needs into research problems. S/he also would facilitate the flow of information between manager and researcher that is so important for bringing the researcher into the decision-making process.

Decision-driven Research

Business research has an inherent value to the extent that it helps management make better decisions. Interesting information about consumers, employees or competitors might be pleasant to have, but its value is limited if the information cannot be applied to a critical decision. If a study does not help management select more efficient, less risky, or more profitable alternatives than otherwise would be the case, its use should be questioned. The important point is that applied research in a business environment finds its justification in the contribution it makes to the decision maker's task and to the bottom line.

1.4 Types of research

Classification of Research

In the fields of general education, health education, physical education, recreation, etc there exists 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:

- The field of study in which the research is conducted. i.e. discipline; for example educational research, sociological research, marketing research etc
- The place where the research is conducted. Hence we talk in forms of field research, laboratory research, community research etc.
- Application of the research – the way/mode in which the findings of the research will be used eg, Action research, service research etc
- Purpose of the research ie basic research, action research, applied research and evaluation research.
- By methods of analysis, ie, descriptive research and empirical research
- Character of data collected ie qualitative research and quantitive research.
- 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 is characterized by a 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 applications of the findings to actual problems or situations. Such research does however often lead to further research of the practical nature and may infact provide the very basis of this further research.

Applied Research

The type of research which is conducted for purpose of improving present practice, normally applied research is conducted for the purposes of applying or testing theory and evaluating its usefulness in solving problems. Applied research provides data to support theory or suggest the

development of new theories. It is the research done with the intention of applying the results of its findings to solve specific problems, currently being experienced in an Organization.

Action Research

This is a small scale intervention in the functioning of the real world and a close examination 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.

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. Eg 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.

Correlational 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 exists between two or more quantifiable variables. The main purpose of correlation research is to describe the nature of the relationship between the two variables. Correlational research helps in identifying the magnitude if the relationship.

Many techniques have been deviced to provide us with numerical representations of such relationships and these are known as <u>measures of association</u>. The most commonly used measures of association are two:

- Pearson's product moment of coefficients.
- Spearman's rank order correlation.

Correlational techniques are generally intended to answer 3 questions:

1. Is there a relationship between the two variables?
2. If the answer is Yes, what is the direction of the relationship (nature of relationship) (- or +)
3. What is the magnitude of the relationship?

Casual Research

A casual study is one which is done to establish a definative 'cause' 'effect' 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's 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 a multiple cases of a problem which are linked to many factors ie Does a payrise cause higher productivity?

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 research involves the identification and limitation of a problem of an area of study which is based on past events. The researcher aims to:

- Locate as many pertinent sources of information as possible concerning the specific problem.
- 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 is exceptionally useful for all types of scholarly study and research.

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 a stimulus ie, 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.

Longitudinal Studies

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

i) **Trend Studies:** are those that study changes within some general population over time. Ie a series of opinion polls during the course of an election campaign, showing trends in the relative strengths and standing of different candidates.

ii) **Cohorot Studies:** examine more specific subpopulations (cohorts) as they change overtime. Typically a cohort is an age group, such as those people born 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 30-35 years of age in 1980, and another sample 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 everymonth during an election campaign and asked for whom they intended to vote for. Such a study would not only make it possible to analyse 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.

1.5 Review Questions

1. You have received a research report done by a consultant for your firm, a life insurance company. The study is a survey of morale in the home office and covers the opinions of about 500 secretaries and clerks plus about 100 executives and actuaries. You are asked to comment on its quality. What will you look for?
2. As the Area Sales Manager for a diary industry you have been assigned the responsibility of conducting a research study to estimate the sales potential of your products in the domestic market or the East African region. Discuss key issues and concerns arising from the fact you, the Manager are also the researcher.
3. Citing examples from the business world, describe the following types of research:

i) Basic Research
ii) Applied Research
iii) Descriptive Research
iv) Experimental Research
v) Historical Research

References

1. A.D. Jankowicz (2005) Business Research Projects 4TH Edition,Luton Business School, UK

2. Margaret Peil (1995) social science research methods. East African Educational Publishers.

TOPIC TWO

THE RESEARCH PROPOSAL

OBJECTIVES

At the end of this lecture, you should be able to:

1. State the purpose of a research proposal.
2. Identify and describe various types of proposals.
3. Describe the structure of the research proposal.
4. Explain how a proposal is evaluated.

2.0 INTRODUCTION

After the identification of the research topic, the next step is the development of the research proposal. *It is a statement in writing, spelling out one's intentions of carrying out a research in a specified area*. The proposal outlines the approach, strategy, as well as the techniques to be followed in conducting a study. *The proposal is a kind of 'blue print' or a guide to the systematic study of a topic.* It is a written summary of what a researcher intends to do. A proposal is also known as a work plan, prospectus, outline, statement of intent, or draft plan that tells us what, why, how, where, and to whom it will be done. It must also show the benefit of doing it. For the student or researcher, it provides a plan of action for the approval by supervisors or funding agency.

Many students and beginning researchers view the proposal on unnecessary work. In actuality, the more inexperienced a researcher is, the more important it is to have a well planned and adequately documented proposal. The research proposal is essentially a road map, showing clearly the location from which a journey begins the destination to be reached and the method of getting there. Well-prepared proposals include potential problems that may be encountered along the way and methods for avoiding or working around them, much as a road map indicates alternative routes for a detour.

2.1 Purpose/Importance of a Research Proposal

<u>Definition:</u>

A research proposal is a comprehensive plan for a research project. It is a written description of a research plan that has to be undertaken. It determines the specific areas of research, states the purpose, scope, methodology, overall organization and limitations of the study. It also estimates its requirements for equipment (if necessary), finance and possible personnel.

The research proposal is of great significance both to the researcher and the readers.

1. *It makes known one's intentions of getting involved with research work and this is done through the researcher spelling out the objectives of his/her study.*
2. *The process of writing a proposal allows the researcher to plan and review the steps that will be undertaken in the project. It gives the researcher an opportunity to spot flows in the logic, errors in assumptions and even problems that are not adequately addressed by the objectives and design of the study.*
3. *In general, it provides justification for funding, if one is out in the business/consultancy world. One has to justify the use of resources. If one is in an academic setting, the proposal must provide justification for acceptance as contributing to either existing knowledge or adding to it (that is either extending the current field of work or providing additional knowledge to the existing field).*
4. *After the proposal is done and approved, the document serves as guide for the researcher throughout the investigations, ie, progress can be monitored.*
5. *The proposal provides a basis for the evaluation of the document; it gives the research advisor a basis for assisting the researcher.*
6. *A well-designed research proposal helps the researcher to avoid the tiring and time consuming alterations once the research project takes off.*
7. *The proposal forces time management and budget estimate. These estimates allow researchers to plan the project in such a way that the work progresses steadily towards the deadline. Since many people tend to follow the work, having a schedule helps researchers work towards the completion of the project.*
8. *A proposal also provides an opportunity for the researcher to discuss the research efforts of others who have worked on related areas.*
9. *A proposal is also able to suggest the data necessary for solving the problem and how the data will be gathered, treated, and interpreted.*
10. *In addition, the proposal of a contact researcher must present its plan, services and credentials in the best possible way to encourage its selection over competitors. In contract research, the survival of companies depends on their ability to develop wining proposals.*

A note on Sponsor Uses

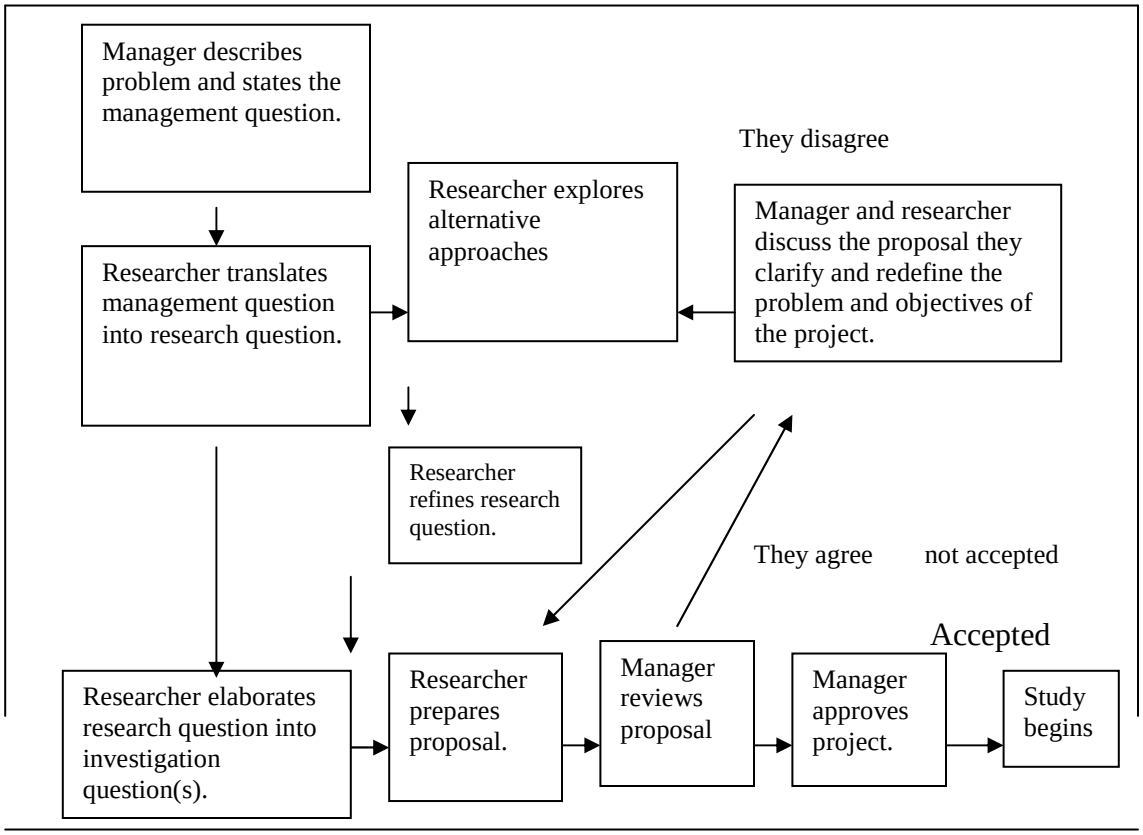
All research has a sponsor in one form or another. The student researcher is responsible to the class instructor. In a corporate setting, whether the research is being done in-house by a research department or under contract to an external research firm, management sponsors the research. University, government, or corporate sponsored (grant) research uses grant committees to evaluate the work.

- A research proposal allows the sponsor to assess the sincerity of your purpose, the clarity of your design, the extent of your background material, and your fitness for undertaking the project.
- The proposal displays your discipline, organisation, and logic. A poorly planned, poorly written, or poorly organised proposal damages your reputation more than the decision not to submit one.
- Depending on the type of research and sponsor you have, various aspects of a standard proposal design are emphasised.

- The proposal, then, provides a document the sponsor can evaluate based on current organisational, scholastic, or scientific needs. It allows the research sponsor to assess both the researcher and the proposed design, to compare them against competing proposals, and to make the best selection for the project.

- Comparison of the results with the proposal is the first step in the evaluation process. It provides a basis for the sponsor to evaluate the results of a project. By comparing the final product with the stated objectives, it is easy for the sponsor to decide if the research goals have been achieved.
- Another benefit of the proposal is the discipline it brings to the sponsor. Many managers, requesting an in-house, departmental research project, do not adequately define the problem they are addressing. The research propsoal acts as a catalyst for discussion between the person conducting the research and the manager. The researcher translates the management question, as described by the manager, into the research questions and outlines the objectives of the study. Upon review, the manager may discover that the interpretation of the problem does not encompass all the original symptoms. The proposal, then, serves as the basis for additional discussion between the manager and the researcher untill all aspects of the management question are understood

Figure 4.1 reveals proposal development can work in an interative fashion.



Source: Cooper Schindler (1998). P.87

2.2 Types of Research Proposals

There are two main types of research proposals:

- ❖ Academic research proposals
- ❖ Project research proposals (business proposals)

In general, business proposals can be divided between those generated internally and externally.

- An internal proposal is done for the corporation by staff specialists or the research department of the firm.
- External proposals are either solicited or unsolicited. Sponsors can be university grant committees, government agencies, corporations, and so forth. With few exceptions, the larger the project, the more complex is the proposal.

Academic Research Proposals

These are proposals in which the researcher proposes to undertake a piece of research on some patinent issue leading to a definite academic qualification ie, diploma, degree, masters, doctorate etc. These are certain specific components that must go into such a proposal although the format may vary from institution to institution. The accepted format should be known to the student before embarking on writing of the proposal.

2.3 The Structure of the Research Proposal

The proposal can be structured in 3 sections:

a) Preliminary Information:

The title page should have the following information:

(i) A clear title: This should have title of the study eg, Nakumat Supermarkets: A study of the Factors that Enhance the Organisational Commitment of Employees.

(ii) Name of the student registration no/department/faculty registered in.

(iii) Required fulfillment eg, proposal submitted in partial fulfilment of the degree in Business Administration, Mount Kenya University; May 2002.

Other preliminary information should then follow, ie,

(iv) Table of contents

(v) Authority from supervisors ie, this proposal has been submitted with the approval of the university supervisor(s).

1. ……..
2. …….

(vi) Declaration page: This declares the research to be one's original work and not a duplicate from elsewhere.

(vii) List of abbreviations.

(viii) List of figures (if any)

b) CHAPTER ONE

1.0 Introduction

- 1.1 Background to the problem
- 1.2 The statement of the problem
- 1.3 The purpose of the study
- 1.4 The objectives of the study
- 1.5 Research questions
- 1.6 Research hypothesis (these can be substituted with assumptions of the study. In other words, it is not necessary or a must for the student to have research hypothesis especially if the study is of descriptive nature).
- 1.7 Theoretical background / conceptual framework.
- 1.8 Rationale or justification / conceptual framework

1.9 Limitations and delimitations of the study.
1.10 Assumptions of the study.
1.11 Definition of terms.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction
2.1 Theoretical literature review
2.2 Empirical literature review
2.3 Summary of literature.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.0 Introduction (not always necessary)
3.1 Research design.
3.2 Target population.
3.3 Sampling procedures.
3.4 Methods of data collection
3.5 Procedures of data collection
3.6 Data analysis

c) References or Bibliography

Names of authors of the books reviewed, ie,

Name of author	Name of book	Published by	Year	Place
John Peters	Research Methods	Kenya Ltd	1997	Nairobi Kenya

Appendices

- Time schedule
- Budget
- Data collection instruments and any other document that the researcher may consider important for the readers.

Format

✓ **Executive Summary / Abstract**

This allows the reader to understand quickly the thrust of the proposal. It is essentially an informative abstract, giving the reader the chance to grasp the essentials of the proposal without having to read the details. As such, the abstract should include brief statements of the problem and research questions, the research objectives and the benefits of your approach (methodology). It should also have some preliminary information on the expected findings. Ideally, the executive summary should be kept to a single page.

Introduction/Background of the Study

This is meant to stimulate interest of the reader. It acquaints the reader with the problem, provides some background and necessary information about the study. A good introduction

shoud be brief and flow smoothly. A well written introduction should lead to the statement of the problem.

Statement of the Problem

This section needs to convince the reader / sponsor to continue reading the proposal. You should capture the reader's attention by stating the problem clearly, its background, and consequences, and the resulting research questions.

The problem statement should be brief and to the point. Problem statements too broadly defined cannot be addressed adequately in one study. Therefore, after reading this section, the reader should know the problem, its significance and why something should be done to change the status quo.

- *Remember, problem statement is the most critical part of the study, ie, without a proboem, there is no study*!

Purpose of the Study

A broad statement indicating what the researcher intends to do about the problem being investigated. Why have you undertaken to investigate this problem? Why now?

Objectives of the Study

This module addresses the purpose of the investigation. It is here that you lay out exactly what is being planned by the proposed research. The objectives module flows naturally from the problem statement, giving the reader concrete, and achievable goals. The objectives should be stated clearly and must be testable. Objectives should be specific be as possible. Objectives are important because:

- They determine the kind of research questions to be asked (posed).
- They determine the data collection and analysis procedures to be used.
- The research objectives section is the basis for judging the remainder of the proposal and ultimately, the final report. Verify the consistency of the proposal by checking to see that each objective is discussed in the research design, data analysis and results sections.

Research Questions

These refer to the questions which a researcher would like to be answered by undertaking the study. Research questions are more of objectives put in a question form, sometimes it is not necessary to have both. In a case where the objectives are general statements, then it may be necessary for the research questions to be concluded. The research questions should be very specific and guiding to the study.

Significance / Justification of the Study

Highlights the reasons for conducting the research, for instance what gaps in knowledge has the study addressed? Has it contributed to the solution of an immediate problem? Who will the research benefit?

Limitations and Delimitations of the Study

A limitation is an aspect of the study that the researcher knows may negatively affect the results or generalizability of the results but which s/he has no control over. In other words, it is a factor that will affect the study in an important way and it is not in the control of the researcher. For example, when one is administering a questionnaire, one may not be in a position to force people to answer certain questions which are personal. Again, people may constantly go on giving wrong replys to some questions and this affects the contents of the study.

Delimitation on the other hand is an aspect mainly been able to be controlled by the researcher. For example, the researcher is able to control the sampling size, location of the study, be able to know how many research assistants are required. These aspects may also affect the outcome of the study to a certain extent.

In summary the limitations surface as variables which cannot be controlled by the researcher but affect the study. As a researcher, one must be honest enough to admit and is possible outline these limitations. Not stating these limitations is morally and ethically wrong.

Hypothesis

In general, a hypothesis is a suggested solution to a problem. It is remains largely a guess until facts are found to confirm or discredit it. The word hypothesis is a Greek word meaning 'ground work' or 'bases – supposition, proposition. Hypothesis would generally be generated by the theory being used. In most cases, without clear hypothesis people have wasted time doing circular studies.

Review of the 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 focus 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 should be comprehensive and detailed. Such a detailed review will enable one to access if there is 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 have they defined the various concepts 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 analyse 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 – ie, 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 professionals 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 specialised in certain fields. 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 study. 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 / computerised information banks

In summary, such information centres 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-specialised 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.

Specification of the Research Methodology

This section gives a detailed procedure of the methods to be used for the study. The literature review section is used as the basis of methodology investigation. In other words literature review specifies the methods used and you can use the information to model your methodology.

This section should also provide information on the data one intends to use, sources of that data, the characteristics / attributes of that data, ie, the population. It will also indicate whether if there are any manipulations to be done on the data. How does one go about generating qualitative data?

In summary, this section outlines the research design to be used. It provides the model which the researcher is going to use. One can provide preliminary results depending on the kind of investigation been undertaken.

Research Design

The design describes what you are going to do in technical terms. This section should include as many subsections as needed to show the phases of the project. Provide information on your proposed design for tasks such as sample selection and size, data collection method, instrumentation, procedures, and ethical requirements. When more than one way exists to approach the design, disucss the methods you rejected and why your selected approach is superior.

Data Analysis
A brief section on the methods used for analysing the data is apropriate for large-scale contract research projects and doctoral theses. With smaller projects, the proposed data analysis would be included within the research design section. Describe your proposed treatment and the theoretical basis for using the selected techniques.

This is often an arduous section to write. By use of sample charts and dummy tables, you can make it easier to understand your data.

Appendices
Any detail that reinforces the body of the proposal can be included in an appendix. This includes researcher vitae, budget details, lengthy descriptions of special facilities, definition of terms etc.

Bibliography
For all projects that require literature review, a bibliography is necessary. Use the bibliographic format required by the sponsor / supervisor.

Example:
Author, year of publication, title of the book, publisher, place of publication:
Koutsoyiannus, A; 1973: **Theory of Econometrics**; 2nd edition, Mcmillan, London

Time Plan and Budget
Time plan is important for monitoring the development of the study. One should set out a time plan for literature review, a draft report and final report.

One should also estimate the resources that are going to be committed to the project. One should establish the main cost components.
Research personnel cost – main researcher, assitants.
Equipment requirements / office supplies
Travel costs
Publication costs
Miscellaneous costs / contingencies

Evaluating the Research Proposal
In practice, many items contribute to a proposal's acceptance and funding.

- First, the proposal must be neatly presented. Although a proposal produced on a word processor and bound with an expensive cover will not overcome design or analysis deficiencies, a poorly presented, unclear, or disorganised proposal will not get serious attention for the reviewing sponsors.

- Second, the proposal's major topics should be easily found and logically organised. The reviewer should be able to page through the proposal to any section of interest.
- The proposal also must meet specific guidelines set by the sponsoring company or agency. These include budgetary restrictions and schedule deadlines.
- A fourth important aspect is the technical writing style of the proposal. The problem statement must be easily understood. The research design should be clearly outlined and methodology explained. The importance / benefits of the study must allow the sponsor to see why the research should be funded. The objectives and results sections should communciate exactly the goals and concrete results that will come from the study.
- Finally, budget and schedule considerations must be kept in mind. A schedule that does not meet the expected deadlines will disqualify the proposal. A budget that is too high for the allocated funds will be rejected. Conversely, low budgets compared to competing proposals suggest that something is missing or there is something wrong with the researcher.

4.4 Review Question

1. Describe the structure of a proposal (academic).

2. Select a research report from a management journal. Outline a proposal for the research as if it had not yet been performed. Make estimates of time and costs.

3. What modules would you suggest be included in a proposal for each of the following case?

   a) You are competing for a university sponsored student research grant, awarded to seniors and graduate students.
   b) A bank is interested in understanding the population trends by location so that it can plan its new branch locations for the next five years. They contracted you for a proposal.

References

3. A.D. Jankowicz (2005) Business Research Projects 4TH Edition,Luton Business School, UK

4. Margaret Peil (1995) social science research methods. East African Educational Publishers.

TOPIC THREE

THE RESEARCH PROCESS

Objectives

By the end of this lecture, you should be able to:

1. Define the term measurement
2. Describe various measurement scales
3. Describe the characteristics of sound measurement
4. Be able to distinguish between validity and reliability.
5. Distinguish between sample and census.
6. List the key steps in a systematic sampling procedure.
7. Distinguish between probability and non probability samples.

3.0 Introduction

Writers usually treat the research task on a sequential process involving several clearly defined steps. Variations are suggested for different situations, but there is much similarity among the sequences proposed. No one claims that research requires completion of each step before going to the next. Recycling, circumventing and skipping occur. Some steps are begun out of sequence, some are carried out simultaneously and some may be omitted. Despite these variations the idea of a sequence is useful for developing a project and for keeping the project orderly as it unfolds.

A research problem is any situation where a gap exists between the actual and the desired (ideal) state. It is an area or an issue where a researcher should know exactly what is the issue, for which he/she is trying to seek answers for.

Note that the research process starts with an area of interest an idea you would like to investigate or a theory you may be interested in proving. Then you may provide operational definition for concepts you are going to study. This is followed by a selection of the research method.

Observation is a stage where the researcher observes certain characteristics that are occuring or some new behaviour, attitudes that are beginning to surface in one's environment. This would involve seeking of information to know more about what one has observed. Data is then processed (ie through theory formulation, hypothesis formulation and testing). Data gathered are then statistically analysed to see if the hypothesis that were generated on being supported. The

statistical instrument for analysis must be selected carefully to suit the nature of data being analysed.

Analysis (deduction) is the process of arriving at conlusions by interpreting the meaning or results of data analysis. The conclusions must be drawn carefully based on the research questions raised and the hypothesis formulated. At this stage the researcher should be able to make recommendations on how the problem addressed can be solved.
Science is an enterprise dedicated to 'finding out'. The research design addresses the planning of scientific inquiry – designing a strategy of finding something. There are two major aspects of research design:

- ✓ You must specify precisely what you want to find out.
- ✓ You must determine the best way to do that.

Ultimately, scientific inquiry comes down to making observations and interpreting what you've observed. Before you can observe and analyze, however, you need to plan. You need to determine what you are going to observe and analyze. That is what research design is all about.

Suppose you are interested in studying *Corruption in government*

- What specifically are you interested in?
- What do you mean by corruption?
- What kinds of behaviour do you have in mind?
- What do you mean by government?
- Who do you want to study? The general public? Or civil servants? Or elected officials etc.
- Finally, what is your purpose? Do you want to find out *how much* corruption there is? Or do you want to learn *why* corruption exists?

These are the kinds of questions that need to be answered in the course of a research design.

3.1 What is Research Design?

There are many definitions of research design, but no definition imparts the full range of important aspects. Kerlinger N F (1986) defines a research design *as the plan and structure of investigation so conceived on to obtain answer to research questions*. The plan in the overall scheme or program of the research; It includes an outline of what the investigator will do from writing hypothesis and their operational implication to the final analysis of data. A structure is

the framework, organization, or configuration of….; the relations among variables of a study. A research design expresses both the structure of the research problem and the plan of investigation used to obtain empirical evidence on relations.

Phillips S B (1971) noted that the research design constitutes the blueprint for the collection, measurement, and analysis of data. It aids the scientist in the allocation of his limited resources by posing crucial choices. Is the blueprint to include experiments, interviews, observation, the analysis of records, simulation, or some combination of these? Are the methods of data collection and the research situation to be highly structured? Is an intensive study of a small sample more efficient that a less intensive study of a large sample? Should the analysis be primarily quantitative or qualitative?

The two definitions differ in detail, but together they give the essentials of research design

- First, the design is a plan for selecting the sources and types of information used to answer the research question(s).
- Second, it is a framework for specifying the relationships among the study's variables.
- Third, it is a blue print that outlines each procedure from the hypothesis to the analysis of data. The design provides answers for such questions as these.
    - What techniques will be used to gather data?
    - What kind of sampling will be used?
    - How will time and cost constraints be dealt with?

In a nutshell, the purpose of the research design is two fold:-

i) Provide answers to the research question(s)
ii) Introduce a kind of orderliness in the process of answering the question(s)

A good research design is therefore the one that enables one to answer the research question validly, objectively, accurately and economically. It is one that also enables one to provide empirical data to the research question(s).

There are many research designs as there are many approaches to hypothesis testing. One wants to have a design that provides dependable and valid answers.

3.2 Classification of Designs

Early in any research study, one faces the task of selecting the specific design to use. A number of different design approaches exist, but unfortunately no simple classification system defines all the variations that must be considered. Cooper and Schindler have classified research design using at least eight different descriptions.

1. *The degree to which the research question has been crystallized (the study may be either exploratory or formal).*
2. *The method of data collection (studies may be observational or communication based).*
3. *The power of the researcher to produce effects in the variables under study (the two major types of research are experimental and ex post facto).*
4. *The purpose of the study (research studies may be descriptive or casual)*
5. *The time dimension (research may be cross-sectional or longitudinal).*
6. *The topical scope – breadth and depth – of the study (a case or statistical study).*
7. *The research environment (most business research is conducted in a field setting, although laboratory research is not unusual; simulation is another option.*
8. *The subjects' perceptions of the research (do they perceive deviation from their everyday routines).*

A brief discussion of these descriptors illustrates their nature and contribution to research.

1. **Degree of Research Question Crystallization**

A study may be viewed as exploratory or formal. The essential distinction between these two is the degree of structure and the immediate objective of the study. **Exploratory studies** tend toward loose structures with the objective of discovering future research tasks. The immediate purpose of exploration is usually to develop hypotheses or questions for further research. *The Formal Study* begins where the exploration leaves off – it begins with a hypothesis or research question and involves precise procedures and data source specifications. The goal of a formal research design is *to test the hypotheses or answer the research questions posed.*

The exploratory-formalized dichotomy is less precise than some other classifications. All studies have elements of exploration in them, and few studies are completely uncharted.

2. **Method of Collection**

This classification distinguishes between monitoring and interrogation/communication process. The former includes observational studies, in which the researcher inspects the activities of a subject or the nature of some material without attempting to elicit responses from anyone. Traffic counts at an intersection, a search of the library collection, an observation of the actions of a group of decision-makers – are all examples of monitoring. In each case the research notes and records the information available from observations.

In *interrogation/communication mode*, the researcher questions the subjects and collects their response by personal or impersonal means. The collected data may result from:

a) Interview or telephone conversations.

b) Self-administered or self-report instruments sent through mail, left in convenient locations, or transmitted electronically or by another means, or

c) Instruments presented before and/or after a treatment or stimulus condition in an *experiment*. (We use the term *communication* to contrast with *observational* because collecting data by questioning encompasses more than the 'survey method).

3. **Researcher Control of Variables**

In terms of the 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 the study. It is enough that we can cause variables to be changed or held constant in keeping with our research objectives. Experimental design is appropriate when one whishes to discover whether certain variables produce effects in other variables. Experimentation provides the most powerful support possible for a *hypothesis of causation.*

With an ex post facto design, investigators have no control over the 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 influence the variables; to do so introduce *bias*. The researcher is limited to holding factors constant by judicious selection of subjects according to strict sampling procedures and by statistical manipulation of findings.

4. Purpose of Study

The essential difference between descriptive and casual studies lies in their objectives. If the research is concerned with finding out *who, what, where, 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 casual. Research on crime is descriptive when it measures the types of crimes committed, how often, when, where, and by whom. In a

casual study, we try to explain relationships among variables – for instance, why the crime rate is higher in city A than in city B.

5. The Time Dimension

Cross-sectional studies are carried out once and represent a snapshot of one point in time. Longitudinal studies are repeated over an extended period. The advantage of a *longitudinal study* is that it can track over an extended period. The advantage of longitudinal study is that it can track changes over time.

In longitudinal studies of the *panel variety*, the researcher may study the same people over time. In marketing, panels are set up to report consumption data on a variety of products. These data, collected from national samples, provide a major data bank on relative market share, consumer response to new products, and new promotional methods. Other longitudinal studies, such as *cohort groups*, use different subjects for each sequenced measurement. The service industry might have looked at the needs of aging baby boomers by sampling 40 to 45-year olds in 1990 and 50 to 55-year olds in 2000. Although each sample would be different, the population of 1945 to 1950 cohort survivors would remain the same.

Some types of information once collected cannot be collected a second time from the same person without the risks of bias. The study of public awareness of an advertising campaign over a six-month period would require different samples for each measurement.

While longitudinal research is important, the constraints of budget and time impose the need for cross-sectional analysis. Some benefits of a longitudinal study can be assured by adroit questioning about past attitudes, history, and future expectations. Response to these kinds of questions should interpret with care, however.

6. The Topical scope

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

Case studies place more emphasis on a 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 on detail provides valuable insight for problem solving, evaluation, and strategy. This detail is secured from multiple sources of information. It allows 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 comparisons, they have a significant scientific role. It is known that 'important scientific propositions have the form of universals, and a universal can be falsified by a single counter-instance. Thus, a single, well-designed case study can provide a major challenge to a theory and provide a source of new hypotheses and constructs simultaneously.

7. The Research Environment

Designs also differ as to whether they occur under actual environmental-conditions or under other conditions. These are called field conditions and laboratory conditions, respectively.

To stimulate is to replicate the essence of a system or process. Simulations are being used more in research, especially in operations research. The major characteristics of various conditions and relationships in actual situations are often represented in mathematical models. Role playing and other behavioral activities may also be viewed as simulations.

8. Subjects' Perceptions

The usefulness of a design may be reduced when people in the study perceive that research is being conducted. *Subjects' perceptions* influence the outcomes of the research in subtle ways. Although there is no widespread evidence of attempts to please researchers through successful hypothesis guessing or evidence of the prevalence of sabotage, when subjects believe that something out of the ordinary is happening, they may behave less naturally. There are three levels of perception;

a) Subjects perceive no deviations from everyday routines.
b) Subjects perceive deviations, but as unrelated to the researcher.
c) Subjects perceive deviations as researcher induced.

In all research environments and control situations, researchers need to be vigilant to effects that may alter their conclusions. These serve as reminder to classify one's study by type to examine validation, strength and weaknesses, and be prepared to qualify results accordingly.

3.3 Exploratory Studies

Exploration is particularly useful when researchers lack a clear idea of the problems they will meet during the study. Through *exploration* researchers develop concepts, establish priorities, develop operational definitions, and improve the final research design. Exploration may also save time and money. If the problem is not as important as first thought, research projects can be cancelled.

Exploration serves other purposes. The area of investigation may be so new or so vague that a researcher needs to do an exploration just to learn something about the dilemma facing the manager. Important variables may not be known or thoroughly defined. Hypothesis for the research may be needed. Also, the researcher may explore to be sure it is practical to do a study in the area.

Despite its obvious value, researchers and managers alike give exploration less attention than it deserves. There are strong pressures for quick answers. And exploration is sometimes linked to old biases about qualitative research: *subjectiveness, nonrepresentativeness, and nonsystematic design*. A wiser view is that exploration saves time and money and should not be slighted.

Secondary Data analysis

The first step in an exloratory study is a search of the secondary literature. Studies made by others for their own purposes represent *secondary data*. It is inefficient to discover anew through the collection of primary data or original research what has already been done.

Within secondary data exploration, a researcher should start first with an organisation's own data archives. Reports of prior research studies often reveal an extensive amount of historical data or decision-making patterns. By reviewing prior studies, you can identify methodologies that proved successful and unsuccessful. Solutions that didn't receive attention in the past due to different environmental circumstances are revealed as potential subjects for further study. The researcher needs to avoid duplication in instances when prior collected data can provide sufficient information for resolving the current decision-making dilemma.

The second source of secondary data is published documents prepared by authors outside the sponsor organisation. There are tens of thousands of periodicals and hundreds of thousands of books on all aspects of business. Data from secondary sources help us decide what needs to be done and can be a rich source of hypothesis.

Special catalogs, subject guides, and electronic indices are available in most libraries that will help in this search. In many cases you can conduct a secondary search from your home or office using a computer, an online service, or an internet gateway.

A search of secondary sources provides an excellent background and will supply many good leads if one is creative. If we confine the investigation to obvious subjects in bibliographic sources, we will often miss much of the best information. Suppose we are interested in estimating the outlook for the copper industry over the next 10 years. We could search through the literature under the headings "copper production" and "copper consumption". However, a search restricted to these two topics would miss more than it finds. When a creative search of the copper industry is undertaken, useful information turns up under the following reference headings: mines and minerals, nonferous metals; forecasting; planning; econometrics; consuming industries such as automotive and communications; countries where copper is produced, such as Chile and Zambia.

Experience Survey

While published data are a valuable resource, seldom is more than a fraction of the existing knowledge in a field put into writing. A significant portion of what is known on a topic, while in writing, may be proprietary to a given organisation and thus unavailalbe to an outside searcher. Also, internal data archives are rarely well organised, making secondary sources, even when known, difficult to locate. Thus, we will profit by seeking information from persons experienced in the area of study, tapping into their collective memories and experiences.

When we interview persons in an *experience survey*, we should seek their ideas about important issues or aspects of the subject and discover what is important across the subject's range. The investigative format we use should be flexible enough so that we can explore various avenues that emerge during the interview. What is being done? What has been tried in the past without success? How have things changed? What are the change-producing elements of the situation? Who is involved in decisions, and what roles do they play? What problem areas and barriers can be seen? What are the costs of the processes under study? Whom can we count on to assist and/or participate in the research? What are the priority areas?

The product of such questioning may be a new hypothesis, the discarding of an old one, or information about the practicality of doing the study. Probing may show whether certain facilities are available, what factors need to be controlled and how, and who will co-operate in the study.

Discovery is more easily carried out if the researcher can analyse cases that provide special insight. Typical of exploration, we are less interested in getting a representative cross-section than getting information from sources that might be insightful. Assume we are called to study an

automobile assembly plant. It has a history of declining productivity, increasing costs, and growing numbers of quality defects. People who might provide insightful information include:

a) Newcomers to the scene – employees or personnel who may have recently been transferred to his plant from similar plants.
b) Marginal or peripheral individuals – persons whose jobs place them on the margin between contending groups. First-line supervisors and lead workers are often neither management nor workers but something in between.
c) Pure cases or cases that show extreme examples of the conditions under study – the most unproductive departments, the most anatognostic wokers, and so forth.
d) Those who fit well and those who do not – the workers who are well established in their organisations versus those who are not, those executives who fully reflect management views and those who do not.
e) Those who represent different positions in the system – unskilled workers, assemblers, superintendents, and so forth.

Focus Groups

With origins in sociology, focus groups became widely used in market research during the 1980s and are used for more diverse research applications today. The most common application of focus group research continues to be in the consumer arena. However, many corporations are using focus group results for diverse exploratory applications.

The topical objective of a focus group is often a new product or product concept. The output of the session is a list of ideas and behavioral observation with recommendations of the moderator. These are often used for later quantitative testing. As a group interview tool, focus groups have applied research potential for other functional areas of business, particularly where the generation and evaluation of ideas or assessment of needs is indespensable. In exploratory research, the qualitative data that focus groups produce may be used for enriching all levels of research questions and ypothesis and comparing the effectiveness of design options.

A focus group is a panel of people led by a trained moderator who meet for 90 minutes to 2 hours. The facilitator or moderator uses group dynamics principles to focus or guide the group in an exchange of ideas, feelings, and experiences on a specific topic. Typically the focus group panel is made up of 6 to 10 respondents. Too small or too large a group results in less effective participation. The facilitator introduces the topic and encourages the group to discuss it among themselves.

Following a topical guide, the moderator will steer the discussion to ensure that all the relevant information desired by the client is considered by the group. The facilitator also keeps gregarious individuals from dominating the conversation, ensuring that each person enters the discussion. The ideal situations, the group's discussion will proceed uninterrupted; however, if

the discussion begins to lag, the facilitator moves it along by introducing another facet of the topic that the group has not yet considered. In some groups a questionnaire is administered to the participants before the group begins to gather additional data. Typically, one or more representatives of the client will sit behind a one-way mirror in the focus group room to observe the verbal and non-verbal interactions and responses of participants.

Advantages and Disadvantages

The primary advantage of the focus group interview as an exploratory research tool is its ability to quickly and inexpensively grasp the core issues of a topic. Focus groups are brief, relatively inexpensive, and extremely flexible. They provide the manager, researcher, or client with a chance to observe reactions to their research questions in an open-ended group setting. Participants respond in their own words, rather than being force-fit into a formalized method.

Focus groups best enable the exploration of surprise information and new ideas. Agendas can be modified as the research team moves on to the next focus group. Even within an existing focus group, an adept facilitator can build on the ideas and insights of previous groups, getting to a greater depth of understanding. However, because they are qualitative devices, with limited sampling accuracy, results from focus groups should not be considered a replacement for quantitative analysis.

3.4 Descriptive Studies

The objective of a descriptive study is to learn the; *who, what, when, where and how* of a topic. The study may be simple or complex; it may be done in many settings. Whatever the form, a descriptive study can be just as demanding of research skills as the causal study, and we should insist on the same high standards for design and execution.

The simplest descriptive study concerns a univariate question or hypothesis in which we ask about, or state about, the size, form distribuion, or existence of a variable. In the account analysis at City Bank, we might be interested in developing a profile of savers. We may want first to locate them in relation to the main office. The question might be, "What percentage of the savers live within a two-mile radius of the office?" Using a hypothesis format, we might predict, "60 percent or more of the savers live within a two-mile radius of the office."

We may also be interested in securing information about other variables:

a) Relative size of accounts
b) Number of accounts for minors
c) Number of accounts opened within the last six months

d) Amount of activity (number of deposits and withdrawals per year) in accounts

Data on each of these variables, by themselves, may have value for management decisions. Bivariate relationships between these or other variables may be of even greater interest. Cross-tabulations between the distance from the branch and account activity may suggest that differential rates of activity are related to account owner location. A cross-tabulation of account size and gender of account owner may also show interrelation. Such correlative relationshis do not necessarily imply a causal relationship.

Descriptive studies are often much more complex than this example. One study of savers began as described and then went into much greater depth. Part of the study included an observation of account records that revealed a concentration of nearby savers. Their accounts were typically larger and more active than those whose owners lived at a distance. A sample survey of savers provided information on stages in the family life cycle, attitudes towards savings, family income levels, and other matters. Correlation of this information with known savings data showed that women owned larger accounts. Further investigation suggested that women with larger accounts were often widowed or working single women who were older than the average account holder. Information about their attitudes and savings practices led to new business strategies at the bank.

Some evidence collected suggested causal relationships. The correlation between nearness to the office and the probability of having an account at the office suggested the question, "Why would people who live far from the office have an account there?" In this type of question a hypothesis makes its greatest contribution by pointing out directions that the research might follow. It might be hypothesized that:

a) Distant savers (operationally defined as those with addresses more than two miles from the office) have accounts in the office because they once lived near the office; they were 'near' when the account decision was made.
b) Distant saves actually live near the office, but the address on the account is outside the two mile radius; they are 'near' but the records do not show this.
c) Distant savers work near the office; they are 'near' by virtue of their work location.
d) Distant savers are not normally near the office but responded to a promotion that encouraged savers to bank via computer, this is another form of 'nearness' in which this concept is transformed into one of 'convenience'.

When these hypotheses were tested, it was learned that a substantial portion of the distant savers could be accounted for by hypotheses (a) and (c) conclusion: Location was closely related to saving at a given association. The determination of cause is not so simple however, and these findings still fall within the definition of a descriptive study.

3.5 Causal Studies

The correlation between location and probability of account holding at the savings and loan association looks like strong evidence to many, but the researcher with scientific training will argue that correlation is not causation. Who is right? The essence of the disagreement seems to lie in the concept of cause.

The concept of Cause

One writer asserts, "There appears to be an inherent gap between the language of theory and research which can never be bridged in a completely satisfactory way. One thinks in terms of theoretical language that contains notions such as causes, forces, systems, and properties. But one's tests are made in terms of covariations, operations, and pointer readings. The essential element of causation is that A 'produces' B or A 'forces' B to occur. But that is an artifact of language, not what happens. Empirically, we can never demonstrate A-B causality with certainty. This is because we do not 'demonstrate' such causal linkages deductively or use the form of validation of premises that deduction requires for conclusiveness. Unlike deductive syllogisms, empirical conclusions are inferences – inductive conclusions. As such, they are probabilistic statements based on what we observe and measure. But we cannot observe and measure all the processes that may account for the A-B relationship.

Previously, we discussed the example of a light failing to go on as the switch was pushed. Having ruled out other causes for the light's failure, we were left with one inference that was probably *but not certainly* the cause.

To meet the ideal standard of causation would require that one variable always caused another and no other variable had the same causal effect. The method of agreement, proposed by John Stuart Mill in the nineteenth century, states "When two or more cases of a given phenomenon have one and only one condition in common, then that condition may be regarded as the cause (or effect) of the phenomenon. Thus, if we can find Z and only Z in every case where we find C, and no others (A, B, D, or E) are found with Z, then we can conclude that C and Z are causally related.

Causal Relationships

Our concern in causal analysis is with how one variable affects, or is 'responsible for', changes in another variable. The stricter interpretation of causation, found in experimentation, is that some external factor 'produces' a change in the dependent variable. In business research, we often find that the cause-effect relationship is less explicit. We are more interested in understanding, explaining, predicting, and controlling relationships between variables than we are in discerning causes.

If we consider the posible relationships that can occur between two variables, we can conclude there are three possibilities. The relationships may be symmetrical, reciprocal, or asymmetrical. A symmetrical relationship is one in which two variables fluctuate together but we assume the changes in either variable are due to changes in the other. Symmetrical conditions are most often found when two variables are alternate indicators of another cause or independent variable. We might conclude that a correlation between low work attendance and active participation in a company camping club is the result of (dependent on) another factor such as a lifestyle preference.

A reciprocal relationship exists when two variables mutually influence or reinforce each other. This could occur if the reading of an advertisement leads to the use of a brand of product. The usage, in turn, sensitizes the person to notice and read more of the advertising of that particular brand.

Most research analysts look for an asymmetrical relationship. With these we postulate that changes in one variable (the independen variable, or IV) are responsible for changes in another variable (the dependent variable, or DV). The identification of the IV and DV is often obvious, but sometimes the choice is not clear. In these latter cases we evaluate them on the basis of (1) the degree to which they may be altered and (2) the time order between them. Since age, social class, climate, world events, and present manufacturing technology are relatively unalterable we normally choose them as independent variables. In addition, when we can detect a time order, we usually find that the IV precedes the DV.

The types of symmetrical relationships are:

1. *Stimulus-response relationship*. This represents an event or forces that result in a response from some object. A price rise results in fewer unit sales; a change in work rules leads to a higher level of worker output, or a change in government economic policy restricts corporate financial decisions. Experiments usually involve stimulus response relationships.
2. *Property-disposition relationship*. A property is an enduring characteristic of a subject that does not depend on circumstances for its activation. Age, gender, family status, religious affiliation, ethnic group, and physical condition are personal properties. A disposition is a tendency to respond in a certain way under certain circmstances. Dispositions include attitudes, opinions, habits, values and drives. Examples of property-disposition relationships are the effect of age on attitudes about saving, gender and its effect on attitudes toward social issues, or social class on opinions about taxation. Properties and dispositions are major concepts used in business and social science research.
3. *Disposition-behaviour relationship*. Behaviour responses include consumption practices, work performance, interpersonal acts, and other kinds of performance. Examples of relationships between dispositions and behaviour include opinions about a brand and its purchase, job satisfaction and work output, and moral values and tax cheating.

4. *Property-behaviour relationship*. Examples include such relationships as the stage of the family life cycle and purchases of furniture, social class and family savings patterns, and age and sports participation. When thinking about possible causal relationships or proposing causal hypotheses, one must state the positional relationship, cause, and effect.

Testing Causal Hypothesis

While no one can be certain that variable A causes variable B to occur, one can gatehr some evidence that increases the belief A leads to B. We seek three types of evidence:

1. Is there a predicted covariation between A and B? do we find that A and B occur together in a way hypothesized? Or when here is less of A, does one also find more or less of B? when such conditions covariation exist, it is an indication of a possible causal connection.
2. Is the time orde of events moving in the hypothesized direction? Does A occur before B? if we find that B occurs before A, we can have little confidence that A causes B.
3. Is it possible to eliminate other possible causes of B? Can one determine that C, D, and E do not covary with B in a way that suggests possible causal connections?

Causation and Experimental Design

In addition to these three conditions, successful inference making from experimental designs must meet two other requirements. The first is referred to as contrl. All factors with the exception of the independent variable must be held constant and not confounded with another variable that is not part of the study. Second, each person in the study must have an equal chance for exposure to each level of the independent variable. This is random assignment of subjects to groups.

Here is a demonstration of how these factors are used to detect causation. Assume you wish to conduct a survey of a university's alumni to enlist their support for a new program. There are two different appeals, one largely emotional and the other much more logical in its approach. Before mailing out appeal letters to 50,000 alumni, you decide to conduct an experiment to see whether the emotional or the rational appeal will draw the greater response. You choose a sample of 300 names from the alumni list and divide them into three groups of 100 each. Two of these groups are designated as the experimental groups. One gets the emotional appeal and the other gets the logical appeal. The third group is the control group and it receives no appeal.

Covariation in this case is expressed by the percentage of alumni who respond in the relation to appeal used. Suppose 50 percent of those who receive the emotional appeal respond, while only 35 percent of those receiving the logical appeal respond. Control group members, unaware of the experiment, respond at a 5 percent rate. We would conclude that using the emotional appeal enhances response probability.

The sequence of events was not a problem. There could be no chance that the alumni support led to sending the letter requesting support. However, have other variable confounded the results?

Could some factor other than the appeal have produced the same results? One can anticipate that certain factors are particlarly likely to confound the results. One can control some of these to ensure they do not have this confounding effect. If the question studied is of concern only to alumni who attended the university as undergraduates, those who only attended graduate school are not involved. Thus, you would want to be sure the answers from the latter group did not distort the results. Control would be achieved by excluding graduate students.

A second approach to control uses matching. With alumni, there might be reason to believe that different ratios of support will come from various age groups. To control by matching, we need to be sure the age distribution of alumni is the same in all groups. In a similar way, control could be achieved by matching alumni from engineering, liberal arts, business and other schools.
Even after using such controls, however, one cannot match or exclude other possible confounding variables. These are dealt with through random assignment.

Randomization is the basic method by which equivalence between experimental and control groups is determined. Experimental and control groups must be established so that they ae equal. Matching and controlling are useful, but they do not account for all unknowns. It is best to assign subjects either to experimental or to control groups at random (this is not to say haphazardly – randomness must be secured in a carefully controlled fashion according to strict rules of assignment). If the assignments are made randomly, each group should receive its fair share of different factors. The only deviation from this fair share would be that which results from random variation (luck of the draw). The possible impact of these unknown extraneous variables on the dependent variables should also vary at random. The researcher, using tests of statistical significance, can estimate the probable effect of these chance variations on the DV and can then compare this estimated effect of exraneous variation to the actual differences found in the DV in the experimental and control groups.

We emphasize that random assignment of subjects to experimental and control groups is the basic technique by which the two groups can be made equivalent. Matching and other control forms are supplemental ways of improving the quality of measurement. In a sense, matching and controls reduce the extraneous 'noise' in the measurement system and in this way improve the sensitivity of measurement of the hypothesized relationship.

3.6 Designing the Study

The ***research design*** is the blueprint for fulfilling objectives and answering question. Selecting a design may be complicated by the availability of a large variety of methods, techniques, procedures, protocols and sampling plans. For example, you may decide on a secondary data study, case study, survey or experiment.

- If a survey is selected, should it be administered by mail, computer, telephone or personal interview?
- Should all relevant data be collected at one time or at regular intervals?
- What kind of structure will the questionaire or interview guide possess?
- What question wording should be employed? Should the responses be scaled or open-ended?
- How will reliability and validity be achieved?
- What kind of training should the data collectors receive?
- What types of sampling should be considered?

These questions represent only a few of the decisions that have to be made when just one method is chosen. The creative researcher can benefit form this confusing array of options. The numerous combinations spwaned by the abudance of tools may be used to construct alternative perspectives on the same problem. By creating a design using diverse methodologies, researchers are able to achieve greater insight than if they followed the most frequent method encountered in the literature or suggested by a disciplinary bias.

Although it must be concluded that students or managers rarely have the resources to pursue a single problem from a multimethod, multistudy strategy, the advantage of several competing designs should be considered before settling on a final one.

3.7 Sampling design

Another step in planning the design is to identify the target population and select the sample if a census is not desired. The researcher must determine how many peolple to interview and who they will be; what and how many events to observe; how many records to inspect and which ones. Once the population of interest is determined, the researcher has to decide whether data will be collected from all study units or from some of the units in the population.

A sample is a part or a portion of the target population carefully selected to represent that population. When researchers undertake sampling studies, they are interested in estimating one or more population values and or testing one or more statistical hypothesis. The sampling process must give every person within a target population a known nonzero chance of selection if probability sampling is used. If there is no feasible alternative, a non profitability approach may be used.

3.8 The Nature of Sampling

Most people intuitively understand the idea of sampling. One taste from a drink tells us whether it is sweet or sour. If we select a few employment records out of a complete set, we usually

assume our selection reflects the characteristics of the full set. If some of our staff favors a flexible work schedule, we infer that others will also. These examples vary in their representativeness, but each is a sample.

The basic idea of *sampling* is that by selecting some of the elements in a population, we may draw conclusions about the entire population. *A population element* is the subject on which the measurement is being taken. It is the unit of study. For example, each office worker questioned about a flexible work schedule is a population element, and each business account analysed is an element of an account population. A population is the total collection of elements about which we wish to make some inferences. All office workers in the firm compose a population of interest; all 4,000 files define a population of interest. A census is a count of all the elements in a population. If 4,000 files define the population, a census would obtain information from every one of them.

Why Sample?

The economic advantages of taking a sample rather than a census are massive. Consider the cost of taking a census.

1. *Why should we spend thousands of shillings interviewing all 4,000 employees in our company if we can find out what we need to know by asking only a few hundred?*
2. *Deming argues that the quality of a study is often better with sampling than with a census. He suggests, 'Sampling possesses the possibility of better interviewing (testing), more thorough investigation of missing, wrong, or suspicious information. Research findings substantiate this opinion.*
3. *Sampling also privides much quicker results than does a census. The speed of execution reduces the time between the recognition of a need for information and the availability of that information.*
4. *Some situations require sampling. When we test the breaking strength of materials, we must destroy them; a census would mean complete destruction of all materials. Sampling is also the only process possible if the population is infinite.*
5. *In few cases, it would be impossible or dangerous to use whole population, ie, testing of vaccine for AIDs – could result in death.*

The advantages of sampling over census studies are less compelling when the population is small and the variability is high. Two conditions are appropriate for a census study: A census is

1. *Feasible* when the population is small and
2. *Necessary* when the elements are quite different from each other.

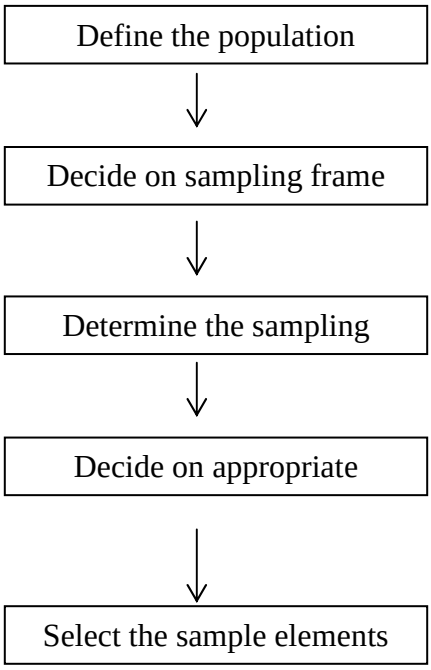
When the population is small and variable, any sample we draw may not be representative of the population from which it is drawn. The resulting values we calculate from the sample are incorrect as estimates of the population values. When the sample is drawn properly, however,

some sample elements underestimate the parameters and others overestimate them. Variations in these values counteract each other, this counteraction results in a sample value that is generally close to the population value. For these offsetting effects to occur, however, there must be enough members in the sample, and they must be drawn in a way to favour neither overestimation nor underestimation.

3.9 Key Steps in the Sampling Procedures

Figure 2.0 outlines the step-by-step procedures that researchers can follow when drawing a sample from a population.

Figure 2.0: The Sampling Procedure



The definition of the population in any study is determined by the purpose of the study. But, the population should be defined very carefully, and in such a manner that another researcher would be able to identify it sufficiently well to reproduce it. The researcher, for example, must specify whether the population consists of individuals such as housewives, college students or lawyers etc.

Secondly, researcher must determine the sampling frame. A sampling frame is the list of study objects from which the sample will be drawn. An ideal sample frame should contain every population object only. Sampling frames can be obtained from research agencies, government departments and organisation.

The researcher must next determine the sampling procedure ie, either probability or non-probability techniques (discussed later).

The researcher must then determine the appropriate sample size. A rule of thumb is that the larger the sample, the more accurate the conclusions drawn are likely to be.
Finally, the researcher then selects the specific study objects to be included in the sample.

3.10 Types of Sampling Designs

The members of a sample are selected either on a probability basis or by another means. **Probability sampling** is based on the concept of *random selection – a controlled procedure that assures that each population element is given a known nonzero chance of selection*.

In contrast, **non probability sampling** is nonrandom and subjective. Each member does not have a known nonzero chance of being included. Allowing interviewers to choose sample members 'at random' (meaning 'as they wish' or 'wherever they find them') is not random sampling. Only probability samples provide estimates of precision.

Table 1 Type of Sampling Designs

	Representation Basis	
Element Selection	Probability	Nonprobability
Unrestricted	Simple random	Convenience
Restricted	Complex random	Purposive
	Systematic	Judgement
	Cluster	Quota
	Stratified	Snowball
	Multi-stage	

Probability Sampling
The unrestricted, simple random sample is the simplest form of probability sampling. Since all probability samples must provide a known nonzero chance of selection for each population element, the simple random sample is considered a special case in which each population element has a known and equal chance of selection. In this section, we use the simple random sample to build a foundation for understanding sampling procedures and choosing probability samples.

1. Simple Random Sampling

In simple random sampling, all study objects have an equal chance of being included in the sample. Researchers begin with a complete list of all members of a population and then choose

sample items at random. It should be noted that in simple random sampling, each study object is selected completely independently of other objects.

The sampling process involves assigning a unique identification number to each study object in the sampling frame. After this, the researcher must design a method of selecting study objects in a manner that allows all equal chance of being selected. One way of doing this is writing these identification numbers on small pieces of paper, mixing them thoroughly in a box, and then picking the papers without looking. The numbers on the pieces of paper picked identify the study objects to be included in the sample. In some cases, however, this procedure (lottery method) may be impractical or tedious.

Another procedure used in selecting study objects in simple random sampling involves the use of tables of random numbers. The researcher begins picking randomly objects from any preselected place in the table of random numbers. Then s/he systematically chooses numbers by either moving vertically or horizontally. The sample will therefore consist of the study objects whose numbers are chosen.

Complex probability Sampling

Simple random sampling is often impractical. It requires a population list that is often not available. The design may also be wasteful because it fails to use all the information about a population. In addition, the carrying out of a simple random design may be expensive in time and money. These problems have led to the development of alternative designs that are superior to the simple random design in statistical and/or economic efficiency.

A more efficient sample in a statistical sense is one that provides a given precision (standard error of the mean) with a smaller sample size. A sample that is economically more efficient is one that provides a desired precision at a lower dollar cost. We achieve this with designs that enable us to lower the costs of data collecting, usually through reduced travel expense and interviewer time.

In the discussion that follows, four alternative probability sampling approaches are considered: *systematic, stratified, cluster and multi-stage.*

2. Systematic Sampling

This method is frequently used in production and quality control sampling. In this approach, every n'th element in the population is sampled, beginning with a random start of an element in the range of 1 to n. After a randomly selected start point(s) a sample item would be selected every n'th item. Assume that in an assembly line it was decided to sample every 100th item and a start point of 67 was chosen randomly, the sample would be the following items:
67th; 167th; 267th; 367th; and so on

The gap between selections is known as the *sampling interval* and is itself often randomly selected.
A concern with this technique is the possible periodicity in the population that may coincide with the sampling interval and cause bias.

3. Stratified Sampling

Most populations can be segregated into several mutually exclusive sub-populations, or strata. Thus, the process by which the sample is constrained to include elements from each of the segments is called *stratified random sampling*.

There are three reasons why a researcher chooses a stratified sample:

- To increase a sample's statistical efficiency;
- To provide adequate data for analysing the various subpopulations, and
- To enable different research methods and procedures to be used in different strata.

With the ideal stratification, each stratum is homogeneous internally and heterogeneous with other strata.

The size of the strata samples is calculated with two pieces of information:

(i) How large the total sample should be and
(ii) How the total sample should be allocated among strata.

Proportional versus Disproportionate Sampling

In proportionate stratified sampling the number of items drawn from each stratum is equal. Suppose a researcher needs a sample from a universe of 500 individuals, ie, n = 500. If she were to select 4 strata ie, s_1, s_2, s_3, and s_4, each would have 125 items. A simple random sample is then selected independently from each group.

In disproportionate sampling, no equal units are drawn but weights are assigned to each stratum. Suppose again the researcher has a sample of 500 which represent income level groups, ie:

Income (Ksh) below 5,000 s1 = 0.4 (500) = 200.
Income (Ksh) 5,000 – 10,000 = s_1 = 0.3 (500) = 150
Income (Ksh) 10,000-50,000 = s_3 = 0.2 (500) = 100
Income (Ksh) above 50,000 = s_4 = 0.1 (500) = 50
500

Random samples are taken from within each group in the proportions that each group bears to the population as a whole. The purpose of stratification is to ensure that the sample mirrors the characteristics of the population. In the case of the study of incomes, by assigning a higher weight to low income groups, the researcher is likely to get a good sample representative.

The main difference between stratified random sampling and simple random sampling is that in the simple random method, sample items are chosen at random from the entire universe, while in the stratified random sampling, the sample items are chosen at random from each stratum.

4. Cluster Sampling

In a simple random sample, each population element is selected individually. The population can also be divided into groups of elements with some groups randomly selected for study. This is *cluster sampling*. An immediate question might be: How does this differ from stratified sampling? They may be compared as follows:

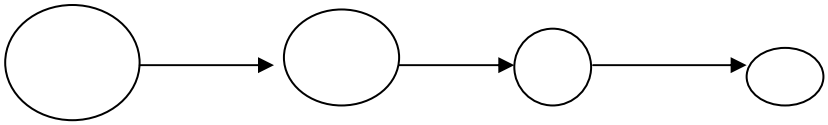
Stratified Sampling	Cluster Sampling
1. We divide the population into a few subgroups each with many elements in it. The subgroups are selected according to some criterion that is related to the variables under study.	1. We divide the population into many subgroups, each with a few elements in it. The subgroups are selected according to some criterion of ease or availability in data collection.
2. We try to secure homogeneity within subgroups and heterogeneity between subgroups.	2. We try to secure heterogeneity within subgroups and homogeneity between subgroups, but we usually get reverse.
3. We randomly choose elements from within each subgroup.	3. We randomly choose a number of subgroups, which we then typically study in toto.

When done properly, cluster sampling also provides an unbiased estimate of population parameters. Two conditions foster the use of cluster sampling: (1) the need of more economic efficiency than can be provided by simple random sampling and (2) the frequent unavailability of a practical sampling frame for individual elements.

Statistical efficiency for cluster samples is usually lower than for simple random samples chiefly because clusters are usually homogeneous. Families in the same block (a typical cluster) are often similar in social class, income level, ethnic origjn, and so forth.

4. Multi-Stage Sampling

This is a practical system widely used to reduce the travelling time for interviewers and the subsequent costs multi-stage sampling is similar to stratified sampling except the groups and sub-groups are selected on a geographical / location basis rather than some social characteristics. For example: Assume you wanted the opinion of female students from universities on gender equality. You would select your sample as:



All universities → Public universities → Students (Female/male) → Female students

It involves selecting sample in stages until you have identified your study unit.

Non-Probability Sampling

Any discussion of the relative merits of probability versus non probability sampling clearly shows the technical superiority of the former. In probability sampling, researchers use a random selection of elements to reduce or eliminate sampling bias. Under such conditions, we can have substantial confidence that the sample is representative of the population from which it is drawn. In addition, with probability sample designs, we can estimate an interval range within which the population parameter is expected to fall. Thus, we not only can reduce the chance for sampling error but also can estimate the range of probable sampling error present.

With a subjective approach like *non probability sampling*, the probability of selecting population elements is unknown. There are a variety of ways to choose persons or cases to include in the sample. Often we allow the choice of subjects to be made by field workers on the scene. When this occurs, there is greater opportunity for bias to enter the sample selection procedure and to distort the findings of the study. Also, we cannot estimate any range within which to expect the population parameter. Given the technical advantages of probability sampling over non probability sampling, why would anyone choose the latter? There are some practical reasons for using these less precise methods.

Practical Considerations

We may use non probability sampling procedures because they satisfactorily meet the sampling objectives. While a random sample will give us a true cross section of the population, this may not be the objective of the research. If there is no desire or need to generalize to a population parameter, then there is much less concern about whether the sample fully reflects the population. Often researchers have more limited objectives. They may be looking only for the range of conditions or for examples of dramatic variations. This is especially true in exploratory research where one may wish to contact only certain persons or cases that are clearly typical.

Additional reasons for choosing non probability over probability sampling are cost and time. Probability sampling clearly calls for more planning and repeated callbacks to ensure that each selected sample member is contacted. These activities are expensive. Carefully controlled non probability sampling often seems to give acceptable results, so the investigator may not even consider probability sampling.

While probability sampling may be superior in theory, there are breakdowns in its application. Even carefully stated random sampling procedures may be subject to careless application by the people involved. Thus, the ideal probability sampling may be only partially achieved because of the human element.

It is also possible that non probability sampling may be the only feasible alternative. The total population may not be available for study in certain cases. At the scene of a major event, it may be infeasible to even attempt to construct a probability sample. A study of past correspondence between two companies must use an arbitrary sample because the full correspondence is normally not available.

In another sense, those who are included in a sample may select themselves. In mail surveys, those who respond may not represent a true cross section of those who receive the questionnaire. The receivers of the questionnaire decide for themselves whether they will participate. There is some of this self-selection in almost all surveys because every respondent chooses whether to be interviewed.

Methods

1. **Convenience**. Non probability samples that are unrestricted are called *convenience samples*. They are the least reliable design but normally the cheapest and easiest to conduct. Researchers or field workers have the freedom to choose whomever they find, thus the name convenience. Examples include informal pools of friends and neighbors or people responding to a newspaper's invitation for readers to state their positions on some public issue.

   While a convenience sample has no controls to ensure precision, it may still be a useful procedure. Often you will take such a sample to test ideas or even to gain ideas about a subject of interest. In the early stages of exploratory research, when you are seeking guidance, you might use this approach. The results may present evidence that is so overwhelming that a more sophisticated sampling procedure is unnecessary. In an interview with students concerning some issue of campus concern, you might talk to 25 students selected sequentially. You might discover that the responses are so overwhelmingly one-sided that there is no incentive to interview further.

2. **Purposive Sampling**. A non probability sample conforms to certain criteria is called purposive sampling. There are two major types – *judgement* sampling and *quota* sampling.
   a) Judgement Sampling occurs when a researcher selects sample members to conform to some criterion. In a study of labor problems, you may want to talk only with those who have experienced on-the-job discrimination. Another example of judgement sampling

occurs when election results are predicted from only a few selected precincts that have been chosen because of their predictive record in past elections.

When used in the early stages of an exploratory study, a judgement sample is appropriate. When one wishes to select a biased group for screening purposes, this sampling method is also a good choice. Companies often try out new product ideas on their employees. The rationale is that one would expect the firm's employees to be more favorably disposed toward a new product idea than the public. If the product does not pass this group, it does not have prospects for success in the general market.

b) **Quota Sampling** is the second type of purposive sampling. We use it to improve representativeness. The logic behind quota sampling is that certain relevant characteristics describe the dimensions of the population. If a sample has the same distribution on these characteristics, then it is likely representative of the population regarding other variables on which we have no control. Suppose the student body of Mount Kenya is 55 percent female and 45 percent male. The sampling quota would call for sampling students at a 55 to 45 percent ratio. This would eliminate distortions due to a nonrepresentative gender ratio.

In most quota samples, researchers specify more than one control dimension. Each should meet two tests: (1) it should have a distribution in the population that we can estimate. (2) It should be pertinent to the topic studied. We may believe that responses to a question should vary, depending on the gender of the respondent. If so, we should seek proportional responses from both men and women. We may also feel that undergraduates differ from graduate students, so this would be a dimension. Other dimensions such as the student's academic discipline, ethnic group, religious affiliation, and social group affiliation may be chosen. Only a few of these controls can be used. To illustrate, suppose we consider the following:

Gender – two categories – male, female

Class level – two categories – graduate and undergraduate

College – six categories – Arts and Science, Agriculture, Architecture, Business, Engineering, other

Religion – four categories – Protestant, Catholic, Jewish, other

Fraternal affiliation – two categories – member, nonmember

Family social-economic class – three categories – upper, middle, lower

Quota sampling has several weaknesses. First, the idea that quotas on some variables assume representativeness on others is argument by analogy. It gives no assurance that the sample is representative on the variables being studied. Often, the data used to provide controls may also be dated or inaccurate. There is also a practical limit on the number of simultaneous controls that can be applied to ensure precision. Finally, the choice of subjects is left to field workers to make on a judgemental basis. They may choose only friendly looking people, people who are convenient to them, and so forth.

Despite the problems with quota sampling, it is widely used by opinion pollsters and marketing and other researchers. Probability sampling is usually much more costly and time-consuming. Advocates of quota sampling argue that while there is some danger of systematic bias, the risks are usually not that great. Where predictive validity has been checked (e.g., in election polls), quota sampling has been generally satisfactory.

3. **Snowball**. This design has found a niche in recent years in applications where respondents are difficult to identify and are best located through referral networks. In the initial stage of snowball sampling, individuals are discovered and may or may not be selected through probability methods. This group is then used to locate others who possess similar characteristics and who, in turn, identify others. Similar to a reverse search for bibliographic sources, the 'snowball' gathers a subject as it rolls along.

   Variations on snowball sampling have been used to study drug cultures, teenage gang activities, power elites, community relations, insider trading and other applications where respondents are difficult to identify and contact.

4. **Dimensional Sampling**. The researcher identifies the various characteristics of interest in a population and obtains at least one correspondent for every combination of those factors. It is a further refinement of the quota sampling technique. (ie, you have a number of features, male/female, so you choose one man to represent the men and one woman to represent the women).

3.11 Resource allocation and budgets

General notions about research budgets have a tendency to single out data collection as the most costly activity. Data collection requires substantial resources but perhaps less of the budget than clients/students will expect. Research assistants must be paid, training and travel must be provided, and other expenses are incurred; but this phase of the project often takes not more than one third of the total research budget. The geographic scope and the number of observations required do affect the cost but much of the cost, is relatively independent of the size of the data-gathering efforts. Thus, a guide might be that:

a. Project planning,
b. Data gathering, and
c. Analysis, interpretation and reporting each share about equally in the budget.

Without budgetary approval, many research efforts are terminated for lack of resources. A budget may require significant development and documentation as in grant and contract research, or it may require less attention as in a student's project or investigations funded out of the researcher's own resources.

3.12 The research approval

A written proposal is often required when a study is being suggested. It ensures that the parties concur on the project's purpose and on the proposed methods of investigation. Times and budgets are often spelled out, as are other responsibilities and obligations. Depending on the needs and desires of the researcher, substantial background detail and elaboration of proposed techniques may be included. The length and complexity of research proposals range widely. Business research proposals normally range from one to ten pages. Applicants for foundations or government research grants typically file a proposal request of a few pages, often in a standardized format specified by the granting agency. With the student's academic research proposal, there is no accepted length but a rule-of-thumb criterion is used to suggest a 20 and 25 page as ideal. Every proposal, regardless of length should include ***two basic sections.***

1. A statement of the research question (problem) and
2. A brief description of research methodology

3.13 Pilot Testing

The data-gathering phase of the research process typically begins with pilot testing. Pilot testing may be skipped when the researcher tries to condense the project time frame.

A pilot test is conducted to detect weakness in design and instrumentation and provide proxy data for selection of a probability sample. It should therefore draw subjects from the target population and simulate the procedures and protocols that have been designated for data collection. If the study is a survey to be executed by mail, the pilot questionnaire should be mailed. If the design calls for observation by an unobstructive researcher, this behaviour should be practiced. The size of the pilot group may range from 25 to 100 subjects depending on the method to be tested, but the respondents do not have to be statistically selected. In very small populations or special applications, pilot testing runs the risk of exhausting the supply of respondents and sensitizing them to the purpose of the study. This risk is generally overshadowed by the improvements made to the design by a trial run.

There a number of variations on pilot testing. Some of them are intentionally restricted to data collection activities. One form, **pretesting** may rely on colleagues, respondent, surrogates or actual respondents for the purpose of refining a measuring instrument. This important activity has saved countless survey studies form disaster by using the suggestions of the respondents to identify and change confusing, awkward, or offensive questions and techniques. Pretesting may be repeated several times to refine instruments and procedures.

3.14 Data collection

The gathering of data may range from a simple observation at one location to a grandiose survey of multinational corporations at sites in different parts of the world. The method selected will largely determine how the data are collected. Questionnaires, standardized tests, observational forms, etc are among the devices used to record raw data.

But what are data? One writer defines **data** on the facts presented to the researcher from the study's environment. Data may be further characterized by their:

a. Abstractness
b. Verifiability
c. Elusiveness and
d. Closeness to the phenomenon

As abstractions data are more metaphorical than real. For example, the growth in GNP cannot be observed directly; only the effects of it may be recorded. Second, data are processed by our senses-often limited in comparison to the senses of other living organisms; when sensory experiences consistently produce the same result, our data are said to be trust worthy because they may be verified.

Third, capturing data is complicated by the speed at which events occur and the time-bound nature of observation. Opinions, preferences and attitudes vary from one decade to another with the passage of time. For example, attitudes about spending during the 1980s differ dramatically one decade later in the same population. Finally, data classified by their closeness to the phenomena. ***Secondary data*** have had at least one level of interpretation inserted between the event and its recording. ***Primary data*** are sought for their promixity to the truth and control over error. These cautions remind us to use care in designing data collection procedures and generalizing from results.

Data are edited to ensure consistency across respondents and to locate omissions. In the case of survey methods, editing reduces errors in the recording, improves legibility and clarifies unclear and inappropriate responses. Edited dates are then put into a form that makes analysis possible.

Desk research

It is also referred to as *secondary research.*

Desk research is term that refers to the collection of secondary data or that which has already been collected.

To most people it suggests published reports, and statistics that are either electronic or in hard copy. Therefore libraries, online databases and the internet are certainly important sources as are speaking to someone at a trade association or carrying out an interview with an industry expert.

Field research

Also referred to as primary market research

Field research refers to the collection of primary data, i.e data collected for analysis for the very first time.

It requires proper preparation since there are a number of items that need to be addressed are for one can set out to the field for data collection.

3.15 Analysis and Interpretation

Raw data are rarely useful in decision making. Researchers generate information by analyzing data after its collection. **Data analysis** usually involves reducing accumulated data to a manageable size, developing summaries, looking for patterns and applying statistical techniques. Further, researchers must interprete these findings in light of the research questions or determine if the results are consistent with their hypothesis and theories.

3.16 Reporting the results

Finally it is necessary to prepare a report and transmit the findings and recommendations to the manager/supervisor for the intended purpose. The style and organization of the report will differ according to the target audience the occasion and the purpose of the research. The results of applied research may be communicated in a conference hall, a letter, a written report or an oral presentation and sometimes all of them. Research reports are occasionally shelved without action. Inferior communication of results is a primary reason for this outcome. At a minimum, a research report should contain these sections:

a) *An Executive summary* consisting of a synopsis of the problem, findings and recommendations.
b) *An overview of the research*. The problem's background, literature summary, methods and procedures, conclusions
c) A section on implementation strategies for the recommendations.
d) *A technical appendix* with all the materials necessary to replicate the project.

3.17 Types of variables

There are five (5) types of variables that one is likely to find in a research study, and these are:

a) Dependent variables
b) Independent variables
c) Intervening variables
d) Extraneous variables
e) Moderating variables

a) Independent and Dependent Variables

Independent variable is a variable that a researcher manipulates in order to determine its change or its influence on another variable (predictor variable), because it will predict the amount of variation that occurs in another variable. It is a variable which influences the dependent variable in either a positive way or a negative way.

The dependent variable attempts to indicate the total influence arising from the total effect arising from the independent variable. A dependent variable therefore varies as a function of the independent variable. In other words, it is the variable which is expected to change as a result of the presence or absence or magnitude of the independent variable.

For example, *does a participative leadership style (independent variable) influence job satisfaction or performance (dependent variables*)? It is important to remember that there are no preordained variables waiting to be discovered 'out there' that are automatically assigned to one category or the other. Has Hover has noted, there is nothing very tricky about the notion of independence and dependence. But there is something tricky about the fact that the relationship of independence and dependence is a figment of the researcher's imagination until demonstrated convincingly. Researchers hypothesize relationships of independence and dependence: they invent them, and then they try by reality testing to see if the relationships actually work out that way.

b) Moderating Variables

In each relationship, there is at least one independent variable (IV) and a dependent variable (DV). It is normally hypothesized that in some way the IV 'causes' the DV to occur. For simple relationships, all other variables are considered *extraneous* and ignored.

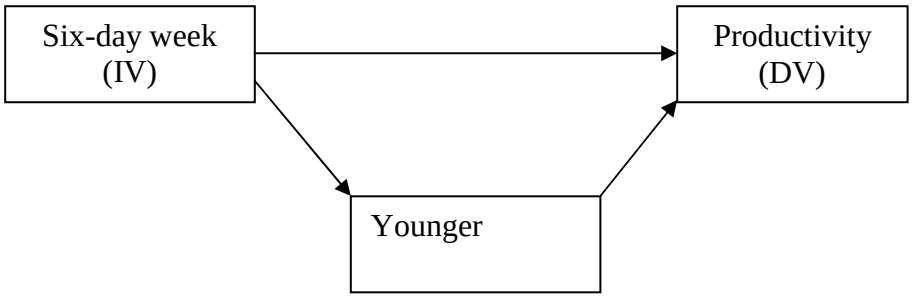
In a typical office, we might be interested in a study of the effect of the four-day workweek on office productivity and hypothesize the following:

- *The introduction of the six-day workweek (IV) will lead to increased office productivity per worker-hour (DV).*

In actual study situations, however, such a simple one-on-one relationship needs to be conditioned or revised to take other variables into account. Often one uses another type of explanatory variable of value here- the moderating variable (MV). *A moderating variable is a second independent variable that is included because it is believed to have a significant contributory or contingent effect on the originally IV-DV* relationship
For example, one may hypothesize that

- *The introduction of the six-day workweek (IV) will lead to higher productivity (DV) especially among younger workers (MV).*

In this case, there is a differential pattern of relationship between the six-day week and productivity that is the result of age differences among the workers.



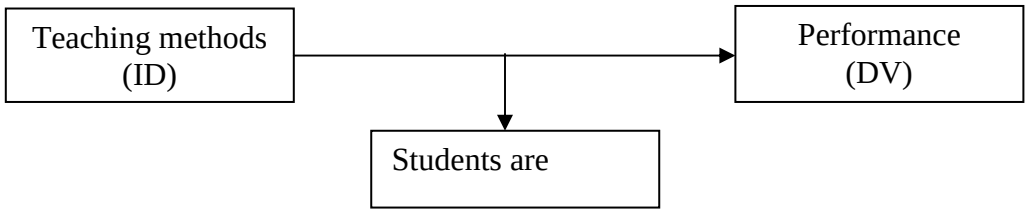
c) Extraneous Variables

These are those variables that affect the outcome of a research study either because the researcher is not aware of their existence, or if s/he is aware, there are not controls for them. If extraneous variables are not considered, it is difficult to determine how much influence on the dependent variable, is due to an extraneous variable and how much is due to the independent variable. Extraneous variables are sometimes referred to as *confounding variables*, because they confound the effect of the independent variable on the dependent variable.

One might think that the *kind of work being done* would have an effect on any work week length impact on office productivity. This might lead to our introducing a control as follows:

- In a routine office work (EV-control), the introduction of a six-day workweek (IV) will lead to higher productivity (DV), especially among younger workers (MV).

In our office example, we would attempt to control for type of work by studying the effects of the six-day week within groups performing different types of work.

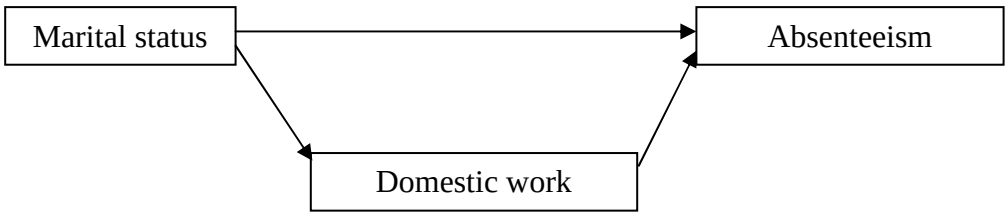


In this example, some students may be performing well as a result of not only good teaching methods, but because of their parentage (genes).

d) Intervening Variables

An intervening variable is a conceptual mechanism through which the IV and the MV might affect the DV. *The intervening variable (IVV) may be defined as 'that factor which theoretically affects the observed phenomenon but cannot be seen, measured, or manipulated, its effect must be inferred from the effects of the independent and moderating variables on the observed phenomenon*. In other words, it is a variable that comes between the independent and dependent variable. It is a variable which surfaces between the time the independent and moderating variable operate to influence the dependent variable.

<u>Illustration</u>



In the case of the workweek hypothesis, one might view the *intervening variable* (IVV) to *be job satisfaction*, giving a hypothesis such as:

- *The introduction of a six-day workweek (IV) will lead to higher productivity (DV) by increasing job satisfaction (IVV).*

We may use the following illustration to demonstrate the relationships involving independent, moderating, controlled extraneous and dependent values.

✓ The management of a bank wishes to study the effect of promotion on savings. It might advance the following hypothesis:

- *A promotion campaign (IV) will increase savings activity (DV), especially when free prizes are offered (MV), but chiefly among smaller savers (EV-control). The results come from enhancing the motivation to save (IVV).*

3.18 Hypothesis

The research literature disagrees about the meaning of the terms proposition and hypothesis. We define a proposition as a statement about concepts that may be judged as true or false if it refers to observable phenomena. *When a proposition is formulated for empirical testing, we call it a hypothesis*. For our purpose, we shall define a hypothesis as a tentative explanation for certain behaviour (phenomena) which have occurred or will occur. *An hypothesis states the research expectations concerning the relationships between the variables in the research problem. It is the most specific statement of the problem and it states what the researcher thinks would be the outcome of the research to be undertaken.*

Hypotheses are derived from or are based on existing theories, previous research, personal observations or experiences. Each hypothesis will usually express a predicted relationship between two or more variables or concepts.
It is important to note that while hypothesis are central to empirical research, *not all researches must have hypothesis.* Were hypothesis are omitted the study should have *a clear statement of research questions, assumptions or objectives*. Hypotheses have to be tested, but assumptions do not have to be tested. Testing hypothesis does not prove or disprove the hypothesis. Data is collected and analyzed determine whether the hypothesized relationship exist. *If the results fail to support a stated hypothesis, it does not mean that the study has failed. Such a situation implies that existing theories or principles need to be revised or retested under various situations.*

Types of Hypothesis

1. Null Hypothesis

It is a statement that no relationship or difference exists between the parameter and the statistic being compared to it. Analysts usually test to determine whether there has been no change in the population of interest or whether a real difference exists. Any relationship in this case or difference between the two is merely due to chances or some error. The null hypothesis is usually denoted as (Ho ;).

<u>Example:</u>

- *There is no relationship between vacation benefits and employees job satisfaction.*
- *There is no significant difference in performance between learners who participate in class discussion and those who do not.*

2. Alternative Direction Hypothesis

It is a statement that states that a relationship or difference exists between the stipulated variable and goes further to specify the nature of the relationship or difference between variables.

This means that the relationship may be stated as being *greater than, less than, increased, decreased, higher than, lower than* etc. Alternative hypothesis are denoted as (H_1 ;).

Example: The higher the vacation benefits, the higher the job satisfaction among employees.

3. Alternative non-directional hypothesis

This type of hypothesis state that there is a relationship or difference between the stipulated variables but the researcher does not know the nature of such a relationship or difference. These types of hypothesis do indicate a relationship or difference but do not indicate the direction of these relationships. From these hypotheses, it is not possible to say whether the relationship is positive or negative.

Example: There is a relationship between vacation benefits and employees job satisfaction.

Good hypothesis should have the following characteristics

- They must state clearly and briefly the expected relationships between variables.
- They must have both the independent and dependent variables.
- They must be based on a sound rationale derived from theory or from previous research or professional experience.
- They must be consistent with generally accepted traits or common sense.
- They must be testable. A hypothesis is not testable if it calls for techniques that are not available with the present state of the art. A hypothesis is also untestable if it calls for an explanation that defies known physical or psychological laws.
- They should be testable within a reasonable period.
- Variables tested in the hypothesis must be consistent with the purpose, statement and objective of the study.
- Good hypothesis must be simple and as precise as possible.

Purposes of having a hypothesis in research (functions)

- Hypothesis provides direction; they bridge the gap between the problem and evidence needed for its solution.
- Hypotheses ensure collection of the evidence necessary to answer the question posed in the statement of the problem.
- Hypothesis permit the researcher to understand the problem with greater clarity and use the data collected to find solutions to the problem.
- Hypothesis form the framework for the ultimate conclusions of a study, researchers always bases their conclusions on the results of tests of their hypothesis.

- Hypothesis enables the investigation to assess the information collected from the stand point of both relevance and organization.

Therefore, the most important role of hypothesis is to guide the direction of the study. A frequent problem in research is the proliferation of interesting information. Unless the researcher curbs the urge to include additional element, a study can be diluted by trivial concerns that do not answer the basic questions posed. The virtue of the hypothesis is that, if taken seriously, it limits what shall be studied and what shall not. It identifies facts that are relevant and those that are not; in so doing, it suggests which form of research design is likely to be more appropriate. A final role of the hypothesis is to provide a framework for organizing the conclusions that result.

1. Theory

A person not familiar with research uses the term *theory to express the opposite of fact*. In this sense, theory is viewed as being speculative. *One hears that Doctor A is too theoretical, that managers need to be practical, or that some idea will not work because it is too theoretical*. This is an incorrect picture of the relationship between fact and theory.

When you are too theoretical, your basis of explanation or decision is not sufficiently attuned to specific empirical conditions. This may be so, but it does not prove that theory and fact are opposites. The truth is that fact and theory are each necessary for each other to be of value. Our ability to make rational decisions, as well as to develop scientific knowledge, is measured by the degree to which we combine fact and theory. We all operate on the basis of theories we hold. In one sense, theories are the generalizations we make about variables and the relationships among them. We use these generalizations to make decisions and predict outcomes.

Consider a situation where you are called on to interview two persons for possible promotion to the position of department manager. Do you have a theory about what characteristics such a person should have? Suppose you interview Ms A and observe that she answers your questions well, openly, and apparently sincerely. She also expresses thoughtful ideas about how to improve departmental functioning and is articulate in stating her views. Ms B, on the other hand, is guarded in her comments and reluctant to advance ideas for improvement. She answers questions by saying what 'Mr. General Manager wants'. She is also less articulate and seems less sincere to Ms A. You would probably choose A, based on the way you combine the concepts, definitions, and hypothesis mentioned into a theory of managerial effectiveness. It may not be a good theory because of the variable we have ignored, but it illustrates that we all use theory to guide our decisions, predictions, and explanations.

A theory is set of systematically interrelated concepts, definitions, and propositions that are advanced to explain and predict phenomena (facts). In this sense, we have many theories and use them continually to explain or predict what goes on around us. To the degree that our

theories are sound, and fit the situation, we are successful in our explanations and predictions. Thus, while a given theory and a set of facts may not fit, they are not opposites. *Our challenge is to build a better theory and to be more skillful in fitting theory and fact together.*

Theory and Research

It is important for researchers to recognize the pervasiveness and value of theory. Theory serves us in many useful ways:

a. First, as orientation, it narrows the range of facts we need to study. Any problem may be studied in a number of different ways, and theory suggests which ways are likely to yield the greatest meaning.
b. Theory may also suggest a system for the researcher to impose on data in order to classify them in the most meaningful way.
c. Theory also summarizes what is known about an object of study and states the uniformities that lie beyond the immediate observation; when it does so, theory can also be used to predict further facts that should be found.

3.19 Review Questions

1. Explain the following terms:
   i. Sample
   ii. Population
   iii. Census
2. What are the benefits of sampling over census?
3. What is the difference between probability sampling and non-probability sampling techniques?
4. What are the major steps in the sampling design procedure?
5. Describe any three probability sampling techniques and any three non-probability sampling techniques
6. Distinguish between the following:

a) Exploratory and formal studies.
b) Experimental and expost facto research designs.
c) Descriptive and causal studies.

7. You have been asked to determine how large corporations prepare for contract negotiations with trade unions. Since you know relatively little about this subject, how will you find out? Be as specific as possible.
8. You are the administrative assistant of a division manager in a large manufacturing organisation. You and the division manager have just come from the general manager's office, where you were informed that the assemblers' performance is unsatisfactory. You had sensed tension among the workers but had not considered it unusual. The division manager calls you into the office after the meeting and instructs you to investigate. Suggest at least three different types of research that might be appropriate in this situation.
9. Discuss the problems of trading off exploration and pilot testing under tight budgetary constraints. What are the immediate and long-term effects?

10. You wish to study a condition that you have observed: 'Some workers seem to be much more diligent than others.

i) Propose at least three concepts and three constructs you might use in such a study.
ii) How might these concepts and/or constructs be related to hypothesis?

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CONTINUOUS ASSESSMENT TEST

Mount Kenya University

Business Research Methods
BBM/SBC 323

CAT (30 MARKS)

1. What is research? Why should there be any question about the definition of research?

2. Managers who wish to have information on which to base a decision face a make-or-buy situation. What are the problems they face in selecting either of these alternatives?

3. You are the Manager of the Mount Kenya Region of a major corporation supervising five animal feed plants scattered over four districts. Corporate headquarters asks you to conduct an investigation to determine whether any of these plants should be closed, expanded, moved or reduced. Is there a possible conflict between your roles as a researcher and Manager? Explain.

4. i. Define the term 'Research proposal'

   ii. Outline the ***three*** essential components of a proposal
5. In a Research proposal, one of the key areas is "statement of the problem." Briefly explain any four challenges faced in articulating the research problem

TOPIC FOUR

BASIC MEASUREMENT AND SEALING TECHNIQUES

Objectives

By the end of this Lecture, you should be able to:

1. Define the term measurement
2. Describe various measurement scales
3. Describe the characteristics of sound measurement
4. Be able to distinguish between validity and reliability.

4.0 Introduction

In everyday usage, measurement occurs when an established yardstick verifies the height, weight or another feature of a physical object. How well you like a song, a painting, or the personality of a friend is also a measurement. In a dictionary sense, to measure is to discover the extent, dimensions, quantity, or capacity of something, especially by comparison with a standard. We measure casually in daily life, but in research the requirements are rigorous.

Measurement in research consists of assigning numbers to empirical events in compliance with a set of rules. This definition implies that measurement is a three part process:

(i) Selecting observable empirical events.
(ii) Using numbers or symbols to represent aspects of the events, and
(iii) Applying a mapping rule to connect the observation to the symbol.

As already noted, measurement is the assignment of numerals to objects or events according to some rules. A rule is a guide that directs you on how to go about assigning numerals. A numeral is a symbol of the form 1, 2, 3, or I, II, III…… A numeral has no quantitative meaning unless we give it such a meaning. It is simply a symbol of special kind. Numbers are used because they facilitate communication of the measurement procedures and the results from researcher to researcher. In addition the use of numbers allows mathematical manipulations of the measurement data.

A note of postulates

A postulate is an assumption that is an essential prerequisite to carrying out some operations or some thinking. In this case it is an assumption about the relations between the objects being measured.

There are three important postulates;

(i) Either (a=b) or (a≠b) but not both. This postulate is necessary for classification in data analysis.

(ii) If (a=b) and (b=c), then (a=c). This postulate enables a measurement to establish the equality of set numbers on a characteristic by comparing objects.

(iii) If (a b) and (b c) then (a c). This is an important postulate and most measurements in marketing research depend on it.

4.1 Types of scales

A scale is a device for measuring magnitude or quantity of a variable. Scales may be a series of steps, degrees, a scheme of graded amounts from the highest to lowest, an indicator of relative size; scales may also designate appropriate categories such as age, sex, etc;

There are four types of scales commonly used as levels of measurements.

(a) Nominal scale

In business and social research, nominal data are probably more widely collected than any other. When you collect nominal data, you partition a set into categories that are mutually exclusive and collectively exhaustive.

In this type of scale, the numbers serve only as labels or tags for identifying objects, events or characteristics. For instance, a person identity card number is a nominal scale. It only serves the function of identifying the person. We can assign numbers to football players, telephone subscribers or to products in a storeroom. These numbers or codes have no mathematical implication, and the only property conveyed by the number is identity. Arithmetic operations cannot be performed on these numbers, as they would have no meaning.

The only permissible mathematical operations in nominal scales are those leased upon counting such as frequencies, modes and percentages.

There are three forms of nominal scales:

(i) label nominal scale

(ii) category nominal scale

(iii) mixture nominal scale

i) Label nominal scale: This is the most elementary nominal scale. A label nominal scale is simply a label assigned to an object in order to identify and keep track of it. In this kind of scaling each label is unique to one object and possesses no meaning in itself.

ii) **Category nominal scale:** This is the most commonly used nominal scale in marketing research. In category nominal scale, numbers are used to represent mutually exclusive and exhaustive categories of objects. Thus, one might classify the residents of a city according to their expressed religious preferences. Classification set A given in table 8.1 is not a sound category nominal scale because it is not collectively exhaustive. Set B meets the minimum requirements, although this classification may be more useful for some research purposes than others.

Table 8

A	B
Baptist	Catholic
Catholic	Jewish
Jewish	Protestant
Lutheran	Other
Methodist	None
Presbyterian	
Protestant	

Thus each category must be assigned to one, and only one scale category, and must possess the measured common characteristic. Other examples of characteristics measured with category nominal scale include sex, tribe and so forth. For instance, in a given study men may be coded '1' and women '2' and this serves no other function apart from classification.

iii) **Mixture nominal Scale:** This is a nominal scale which is partially a label. The numbers and labels assigned football players serve to identify the individual players, and also to place players in a category.

(b)**Ordinal scales**

This is a qualitative scale comprised of equal appearing intervals that rank observations from large to small. This scale indicates rank order only. It does not indicate the nature of the intervals between the ranks. For example, if several soft drinks are scaled according to sweetness, and number 1 represents the highest degree of sweetness, then the drinks assigned number 3 would be sweeter than one assigned number 4 but less sweet than one assigned number 2.

Note that with ordinal scale the only permitted statements are of greater than or less than nature; we cannot make statements about how much less of characteristic one object posses relative to another.

Ordinal measures commonly have only three to five categories, i.e, good, better, best or:

5	4	3	2	1
Excellent	Very good	Average	Below average	Very poor
Or				
Strongly agree	Agree	No opinion	Disagree	Strongly disagree

In dealing with ordinal scale, statistical description to positional measures such as median, quartile, percetile or other summary characteristics which deal with order among quantities.

c) Interval scales

Interval scale has the power of nominal and ordinal scale plus one additional strength; it incorporates the concept of equality in interval (the distance between 1 and 2 equals the distance between 2 and 3). The intervals are known and equal. They can be added, subtracted and their summaries can be subjected to statistical tests. The interval scale does not have an absolute zero. The zero point of this scale is arbitrary, but it permits inferences to be made.

One common example of the interval scaling is the Fahrenheit and centigrade scales used to measure temperature. An arbitrary zero is assigned to each scale, and equal temperature differences are found by scaling equal volumes of expansion in the liquid used in the thermometer.

Interval scales permit inferences to be made about the differences between the entities to be measured (warmness); but we cannot say that any value on a specific interval scale is a multiple of another. Thus a temperature of 50°F is not twice as hot as a temperature of 25°F. Also, the elapsed time between 3 and 6 a.m equals the time between 4 and 7 a.m., but one cannot say 6 a.m. is twice as late as 3 a.m.

When a scale is interval, you use the arithmetic mean as the measure of central tendency. You can compute the average time of first arrival of trucks at a warehouse. The standard deviation is the measure of dispersion for arrival time. Product moment correlation, t-tests, and F-tests and other parametric tests are the statistical procedures of choice.

d) Ratio Scale

This is the highest level of measurement among scales. It incorporates all the powers of the previous scales plus the provision for absolute zero or origin. Ratio scale represents the actual amounts of a variable. Measures of physical dimensions such as weight, height, distance, and are examples. In business research, we find ratio scales in many areas. These include money values, population counts, distances, return rates, productivity rates.

4.2 Sources of measurement differences

The ideal study should be designed and controlled for precise and unambiguous measurement of the variables. Since attainment of this ideal is unlikely, we must recognize the sources of potential error and try to eliminate, neutralize or otherwise deal with them. Much potential error is systematic (results from a bias) while the remainder is random (occurs erratically). Seltiz C etal (1976) has pointed out several sources from which measured differences can come.

(i) The respondent as an error source

A respondent may be reluctant to express strong negative feelings or may have little knowledge about a personality i.e the president, but be reluctant to admit ignorance. This reluctance can lead to an interview of 'guesses'.

Respondents may also suffer from temporary factors like fatigue, boredom, anxiety, or other distractions; these limit the ability to respond accurately and fully. Hunger, impatience, or general variations in mood may also have an impact.

(ii) **Situational Factors**. Any condition that places a strain on the interview can have serious effects on the interviewer – respondent rapport. If another person is present, that person can distort responses by joining in, by distracting, or merely by being present. If the respondents believe anonymity is no ensured, they may be reluctant to express certain feelings.

(iii) The measure as an error source

The interviewer can distort responses by rewording, paraphrasing, or reordering questions. Stereotypes in appearance and action introduce bias. Inflections of voice and conscious or unconscious prompting with smiles, nods, and so forth may encourage or discourage certain replies: careless mechanical processing – checking of the wrong response or failure to record full replies – will obviously distort feelings. In the data analysis stage, incorrect coding and careless tabulation, and faulty statistical calculation may introduce further errors.

(iv) Instrument as an error source

A defective instrument can cause distortion in two major ways. First, it can be too confusing and ambiguous. The use of complex words and syntax beyond respondent

comprehension is typical. Leading questions, ambiguous meanings, mechanical defects (inadequate space for replies, response choice omissions, and poor printing), and multiple questions suggest the range of problems.

A more elusive type of instrument deficiency is poor sampling of the universe of content items. Seldom does the instrument explore all the potentially important issues.

4.3 The Characteristics of Sound Measurement

What are the characteristics of a good measurement tool? An intuitive answer to this question is that the tool should be an accurate counter or indicator of what we are interested in measuring. In addition, it should be easy and efficient to use. There are three (3) major criteria for evaluating a measurement tool:

- **Validity**: This refers to the extent to which a test measures what we actually wish to measure.
- **Reliability**: has to do with the accuracy and precision of a measurement procedure.
- **Practicality**: is concerned with a wide range of factors of economy, convenience, and interpretability.

Validity in research

Validity in research is achieved through the internal and external validity of the study.

Internal validity: This refers to the outcome of the study as based on the function of the program, a study has internal validity if the outcome of the study is a function of the approach being tested rather than results of the causes not systematically dealt with.

Internal validity is justified by the conclusions we have as researchers when we have been able to control the threats of other variables (i.e intervening variables, or moderating variables or extraneous variables). The more you reduce the nuisances (other variables) affecting the study, the more you attain the internal validity. There are three widely accepted classification of internal validity:

(i) *content validity*
(ii) *criterion – related validity*
(iii) *construct validity*

(i) Content validity

The content validity of a measuring instrument is the extent to which it provides adequate coverage of the topic under study. If the instrument contains a representative sample of the universe of subject matter of interest, then content validity is good. To evaluate the content validity of an instrument, one must first agree on what elements constitute adequate coverage of the problem.

(ii) **Criterion-Related Validity**

Criterion-related validity reflects the success of measures used for prediction or estimation. You may want to predict an outcome or estimate the existence of a current behaviour or condition.

These are *predictive* and *concurrent validity*, respectively. They differ only in a time perspective. An opinion questionnaire that correctly forecasts the outcome of a union election has predictive validity. An observational method that correctly categorizes families by current income class has concurrent validity. While these examples appear to have simple and ambiguous validity criteria, there are difficulties in estimating validity. Consider the problem of estimating family income. There clearly is a knowable true income for every family. However, we may find it difficult to secure this figure. Thus, while the criterion is conceptually clear, it may be unavailable.

(iii) **Construct Validity**

One may also wish to measure or infer the presence of abstract characteristics for which no empirical validation seems possible. Attitude scales and aptitude and personality tests generally concern concepts that fall in this category. Although this situation is much more difficult, some assurance is still needed that the measurement has an acceptable degree of validity.

In attempting to evaluate **construct validity**, we consider both the theory and the measuring instrument being used. If we were interested in measuring the effect of ceremony on organizational culture, the way in which ceremony was operationally defined would have to correspond to an empirically grounded theory. Once assured that the construct was meaningful in a theoretical sense, we would next investigate the adequacy of the instrument. If a known measure of ceremony in organizational culture was available, we might correlate the results obtained using this measure with those derived from our new instrument. Such an approach would provide us with preliminary indications of *convergent* validity.

Reliability

Reliability means many things to many people, but in most contexts the notion of consistency emerges. A measure is reliable to the degree that it supplies consistent results. **Reliability** is a contributor to validity and is a necessary but not sufficient condition for validity. The relationship between reliability and validity can be simply illustrated with the use of a bathroom scale. If the scale measures your weight correctly (using a concurrent criterion such as a scale

known to be accurate), then it is both reliable and valid. If it consistently overweighs you by six pounds, then the scale is reliable but not valid. If the scale measures erratically from time to time, then it is not reliable and therefore cannot be valid.

Reliability is concerned with estimates of the degree to which a measurement is free of random or unstable error. It is not as valuable as validity determination, but it is much easier to assess. Reliable instruments can be used with confidence that transient and situational factors are not interfering. Reliable instruments are robust; they work well at different times under different conditions.

4.4 Factors affecting the interval validity of a study

Among the many threats to internal validity, we consider the following:

(a)History

During the time that a research is taking place, some events may occur that confuse the relationship being studied. These are events may either increase or decrease the expected outcomes of the project. These are events which are not part of the project and they are not planned for. They may just happen in the process of the research and have tremendous effects on the results of the study.

(b) Testing

The process of taking a test can affect the scores of a second test. The mere experience of taking the first test can have a learning effect that influences the results of the second test. Subjects who are given a pretest are likely to remember some of the questions or some of the errors they made when they are taking the posttest. They are also likely to do somewhat better on the posttest than they did on the pretest.

c) Instrumentation

This threat to internal validity results from changes between observations, in measuring instruments or in observer. Using different questions at each measurement is an obvious source of potential trouble, but using different observers or interviewers also threatens validity. Observer experience, boredom, fatigue, and anticipation of results can all distort the results of separate observations. For example, an experienced interviewer may obtain more complete information from a correspondent than an inexperienced interviewer. The additional information may be due to the fact that the interviewer has become more skilled in asking questions or observing events and not due to the effect of the program or observing the effects of the treatment.

(d) Maturation:

Changes may also occur within the subject that is a function of the passage of time and not specific to any particular event. These are of special concern when the study covers a long time, but they may also be factors in tests that are as short as an hour or two. A subject can become hungry, bored or tired in a short time, and this condition can affect response results.

(e) Selection

An important threat to internal validity is the differential selection of subjects for experimental and control groups. Validity considerations require that groups be equivalent in every respect. If subjects are randomly assigned to experimental and control groups, this selection problem can be largely overcome. Additionally, matching the members of the groups on key factors can enhance the equivalence of the groups. Validity considerations require that the groups be largely overcome. Additionally, matching the members of the groups on key factors can enhance the equivalence of the groups.

(f) Experiment Mortality

This occurs when the composition of the study groups changes during the test. Attrition is especially likely in the experimental group, and with each dropout, the group changes. Because members of the control group are not affected by the testing situation, they are less likely to withdraw. In a compensation incentive study, some employees might not like the change in compensation method and withdraw from the test group; this action could distort the comparison with the control group that has continued working under the established system, perhaps without knowing a test is under way.

4.5 Factors affecting the external validity of the study

Internal validity factors cause confusion about whether the experimental treatment (x) or extraneous factors are the source of observation differences. In contrast, external validity is concerned with the interactions of the experimental treatment with other factors and the resulting impact on abilities to generalize to times, settings or persons.

(a) Reactive effects of testing:

If pre-testing has been used and which sensitizes the experimental subjects to the particular treatment, then the effect of the treatment may be partially the result of the sensitization of the pre-test.

(b) Interaction effects of selection bias

If the samples draw from the study is not representative of the larger population, then it would be difficult to generalize findings from the samples to the population, and this may arise when the samples are not drawn randomly from the population. Consider a study in which you a cross-section of a population to participate in an experiment, but a substantial number refuse. If

you do the experiment only with those who agree to participate, can the results be generalized to the total population?

c) Other reactive factors

- The experimental settings themselves may have a biasing effect on a subject's response to the treatment. An artificial setting can obviously give results that are not representative of large populations. Suppose workers who are given an incentive pay are moved to a different work area to separate them from the control group. These new conditions alone could create a strong reaction condition.
- If subjects know they are participating in an experiment, there may be a tendency to role-play in a way that distorts the effect of the experimental treatment.

4.6 Common effects related to the research process

There are other situations in which the internal and external validity of the study may both be threatened simultaneously. This is brought about by what we call research effects, which have nothing to do with the treatment.

1. Hawthorne Effect

This refers to a situation where subject awareness of being in an experimental group motivates them to perform better. Therefore the most influential factor on the subjects is not the independent variable but their awareness of being in a special group.

2. The placebo Effect

This is common to medical studies. Researchers observe that a drug administered to any group of parties has two effects.

(i) Chemical effect
(ii) Psychological effect

To counteract this effect, researchers use a placebo and this is an inactive substance which has the same colour and tests as the active drug; Half of the subjects (experimental group) are given the active drug and the other alf (control group) are given the placebo inactive drug.

If there is a significance difference between those two groups, the drug may be said to have a significance effect.

4.7 Review Questions

1. What are the essential differences among nominal, ordinal, interval and ratio scales?

2. You have data from a corporation on the annual salary of each of its 200 employees.
    a) Illustrate how the data can be presented as ratio, interval, ordinal and nominal data.
    b) Describe the successive loss of information on the presentation changes from ratio to nominal.
3. Briefly explain validity in research

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TOPIC FIVE

DATA COLLECTION AND TECHNIQUES

OBJECTIVES

By the end of this lecture, you should be able to:

1. Identify and describe the various methods of collecting primary data.
2. Explain the factors to be considered before choosing a data collection method.
3. List and describe the advantages and disadvantages of using the personal interview, telephone and mail interview.
4. Construct a questionnaire and administer it.

5.0 The sources and collection of data

In practice, most statistical data exist in official and private records that are compiled as part of the routine of the day-to-day activities of public organizations and private firms. Thus, government departments routinely record figures on such matters as births and deaths, number of accidents, per period, quantities of items exported or imported per period etc. Private firms also maintain continuous records on personnel, sales, expenses, production, etc.

Primary data are those which are collected for the first time and thus original in character, whereas secondary data are those which have already been collected by some other persons and which have passed through the statistical machine at least once.

Primary data are in the shape of raw materials to which statistical methods are applied for the purpose of analysis and interpretations. Secondary data are usually in the shape of finished products since they have been treated statistically in some form or the other. Therefore when data are used for purposes other than those for which they were originally complied, they are known as '*secondary*' data.

It may be observed that the distinction between primary and secondary data is a matter of degree or relativity only. The same set of data may be secondary in the hands of one and primary in the hands of others. In general, the data are primary to the source who collects and processes them for the first time and are secondary for all other sources who later use such data.

For instance, the data relating to mortality (death rates) and fertility (birth rate) in Kenya published by the office of Registrar of births and deaths are primary whereas the same reproduced by the United Nations Organization (U.N.O) in its United Nations Statistical Abstract become secondary in as far as the later agency (UNO) is concerned.

5.1 Choice between Primary and Secondary Data

Obviously, there are a lot of differences in the method of collection of primary and secondary data. In the case of primary data which is to be collected originally, the entire scheme of the plan starting with the definition of various terms used, units to be employed, type of enquiry to be conducted, extent of accuracy aimed at etc, is to be formulated whereas the collection of secondary data is in the form of mere compilation of the existing data.

A proper choice between the types of data needed for any particular statistical investigation is to be made after taking into consideration:

- that nature
- the objective, and
- scope of the enquiry;
- the time and finances (budget) at the disposal of researcher;
- The degree of precision aimed at; when conducting a survey, primary data on the great advantage in that the exact information is obtained. Terms can be carefully defined so that misunderstandings are avoided as far as is possible. In fact the investigations can be geared to cover all the ground considered necessary without having to rely on possibly out of date information. The staff carrying out the investigation can be specifically picked for the purpose in mind.

Many business statistics are compiled from secondary data which has certain advantages.

- The information will be obtained more speedily, and at less cost than primary data.
- In addition, no large army of investigators will be required.

Secondary data must, however be used with great care, and the investigator must be satisfied that the data is sufficiently accurate for statistical investigation. It is necessary for the researcher to know the source, the method of compilation and the purpose for which the original investigation was carried out.

Furthermore, information must be available as to the units in which the data is expressed including any change in those units since their original collection, and the degree of accuracy of the results cannot be determined. Secondary data provides an important source of statistical information, particularly when circumstances make it impractical to obtain primary data. It must always, however, be applied in full knowledge of its limitations.

5.2 Modes of data collection

1. Personal Interview

A personal interview (i.e face to face) is a two-way conversation initiated by an interviewer to obtain information from a respondent. The differences in roles of interviewer and respondent are pronounced. They are typically strangers, and the interviewer generally controls the topics and patterns of discussion. The consequences of the event are usually insignificant for the respondent. The respondent is asked to provide information and has little hope of receiving any immediate or direct benefit from this cooperation. Yet if the interview is carried off successfully, it is an excellent data collection technique.

There are real advantages and clear limitations to personal interviewing. The greatest value lies in the depth of information and detail that can be secured.

It far exceeds the information secured from telephone and self-administered studies, mail surveys, or computer (both intranet and Internet). The interviewer can also do more things to improve the quality of the information received than with another method.

Interviewers also have more control than with other kinds of interrogation. They can prescreen to ensure the correct respondent is replying, and they can set up and control interviewing conditions. They can use special scoring devices and visual materials. Interviewers also can adjust to the language of the interview because they can observe the problems and effects the interview is having on the respondent.

With such advantages, why would anyone want to use any other survey method? Probably the greatest reason is that the method is costly, in both money and time. Costs are particularly high if the study covers a wide geographic area or has stringent sampling requirements. An exception to this is the *intercept interview* that targets respondents in centralized locations such as shoppers in retail malls. Intercept interviews reduce costs associated with the need for several interviewers, training and travel. Product and service demonstrations can also be coordinated, further reducing costs. Their cost-effectiveness, however, is offset when representative sampling is crucial to the study's outcome.

Requirements for Success: Three broad conditions must be met to have a successful personal interview. They are;

(1) availability of the needed information from the respondent,
(2) an understanding by the respondent of his or her role, and
(3) Adequate motivation by the respondent to cooperate. The interviewer can do little about the respondent's information level. Screening questions can qualify respondents when there is doubt about their ability to answer. This is the study designer's responsibility.

Interviewers can influence respondents in many ways. An interviewer can explain what kind of answer is sought, how complete it should be, and in what terms it should be expressed. Interviewers even do some coaching in the interview, although this can be a biasing factor.

Interviewing technique

At first, it may seem easy to question another person about various topics, but research interviewing is not so simple. What we do or say as interviewers can make or break a study. Respondents often react more to their feelings about the interviewer than to the content of the questions. It is also important for the interviewer to ask the questions properly, record the responses accurately, and probe meaningfully. To achieve these aims, the interviewer must be trained to carry out those procedures that foster a good interviewing relationship.

Increasing Respondent's Receptiveness

The first goal in an interview is to establish a friendly relationship with the respondent. Three factors will help with respondent receptiveness.

The respondents must

(1) believe the experience will be pleasant and satisfying,
(2) think answering the survey is an important and worthwhile use of their time, and
(3) Have any mental reservations satisfied. Whether the experience will be pleasant and satisfying depends heavily on the interviewer. Typically, respondents will cooperate with an interviewer whose behavior reveals confidence and engages people on a personal level. Effective interviewers are differentiated not by demographic characteristics but by these interpersonal skills. By confidence, we mean that most respondents are immediately convinced they will want to participate in the study and cooperate fully with the interviewer. An engaging personal style is one where the interviewer instantly establishes credibility by adapting to the individual needs of the respondent.

For the respondent to think that answering the survey is important and worthwhile, some explanation of the study's purpose is necessary although the amount will vary. It is the interviewer's responsibility to discover what explanation is needed and to supply it. Usually, the interviewer should state the purpose of the study, tell how the information will be used, and suggest what is expected of the respondent. Respondents should feel that their cooperation would be meaningful to themselves and to the survey results. When this is achieved, more respondents will express their views willingly.

Respondents often have reservations about being interviewed that must be over come. They may suspect the interviewer is a disguised salesperson, bill collector, or the like. In addition, they may also feel inadequate or fear the questioning will embarrass them. Techniques for successful interviewing of respondents in environments they control – particularly their homes – follow.

The Introduction

The respondent's first reaction to the request for an interview is at best guarded one. Interviewer appearance and action are critical in forming a good first impression. Interviewers should immediately identify themselves by name and organization, and provide any special identification. Introductory letters or other information confirms the study's legitimacy. In this brief but critical period, the interviewer must display friendly intentions and stimulate the respondent's interest.

The interviewer's introductory explanations should be no more detailed than necessary. Too much information can introduce a bias. However, some respondents will demand more detail.
For them, the interviewer might explain the objective of the study, its background, how the respondent was selected, the confidential nature of the interview (if it is), and the benefits of the research findings. Be prepared to deal with questions such as: "How did you happen to pick me?" "Who gave you my name?" "I don't know enough about this." "Why don't you go next door?" "Why are you doing this study?"

The home interview typically involves two stages. The first occurs at the door when the introductory remarks are made, but this is not a satisfactory location for many interviews. In trying to secure entrance, the interviewer will find it more effective to suggest the desired action rather than to ask permission. "May I come in?" can be easily countered with a respondent's no. "I would like to come in and talk with you about X" is likely to be more successful.

If the Respondent Is Busy or Away If it is obvious that the respondent is busy, it may be a good idea to give a general introduction and try to stimulate enough interest to arrange an interview at another time. If the designated respondent is not at home, the interviewer should briefly explain the proposed visit to the person who is contacted. It is desirable to establish good relations with

intermediaries since their attitudes can help in contacting the proper respondent. Interviewers contacting respondents door to door often leave calling or business cards with their affiliation and a number where they can be reached to reschedule the interview.

Establishing a Good Relationship The successful interview is based on rapport – meaning a relationship of confidence and understanding between interviewer and respondent. Interview situations are often new to respondents, and they need help in defining their roles. The interviewer can help by conveying that the interview is confidential (if it is) and important and that the respondent can discuss the topics with freedom from censure, coercion, or pressure. Under these conditions, the respondent can obtain much satisfaction in "opening up" without pressure being exerted.

Gathering the Data To this point, the communication aspects of the interviewing process have been stressed. Having completed the introduction and established initial report, the interviewer turns to the technical task of gathering information. The interview centers on a prearranged questioning sequence. The technical task is well defined in studies with a structured questioning procedure (in contrast to an exploratory interview situation). The interviewer should follow the exact wording of the questions, ask them in the order presented, and ask every question that is specified. When questions are misunderstood or misinterpreted, they should be repeated.

A difficult task in interviewing is to make certain the answers adequately satisfy the question's objectives. To do this, the interviewer must learn the objectives of each question from a study of the survey instructions or by asking the research project director. It is important to have this information well in mind because many first responses are inadequate even in the best-planned studies.

The technique of stimulating respondents to answer more fully and relevantly is termed **probing**. Since it presents a great potential for bias, a probe should be neutral and appear as a natural part of the conversation. Appropriate probes (those that when used will elicit the desired information while injecting a limited amount of bias) should be specified by the designer of the data collection instrument. There are several different probing styles:

- *A brief assertion of understanding and interest*. With comments such as "I see" or " "uh-huh," the interviewer can tell the respondent that he interviewer is listening and is interested in more.
- *An expectant pause*. The simplest way to suggest to the respondent to say more is a pause along with an expectant look or a nod of the head. This approach must be used with caution. Some respondents have nothing more to say, and frequent pausing could create some embarrassing silences and make them uncomfortable, reducing their willingness to participate further.

- *Repeating the question*. This is particularly useful when the respondent appears not to understand the question or has strayed from the subject.
- *Repeating the respondent's reply*. The interviewer can do this while writing it down. Such repetition often serves as a good probe. Hearing thoughts restated often promotes revisions or further comments.
- *A neutral question or comment*. Such comments make a direct bid for more information. Examples are: "How do you mean?" "can you tell me more about your thinking on that?" "Why do you think that is so?" "Anything else?"
- *Question clarification*. When the answer is unclear or is inconsistent with something already said, the interviewer suggests the respondent failed to understand fully. Typically of such probes is, "I m not quite sure I know what you mean by that – could you tell me a little more?" Or "I'm sorry, but I'm not sure I understand. Did you say previously that…?" It is important that the interviewer take the blame or failure to understand so as not to appear to be cross-examining the respondent.

Recording the Interview

While the methods used in recording will vary, the interviewer usually writes down the answers of the respondent. Some guidelines can make this task more efficient. Record responses as they are made by the respondent. If you wait until later, you lose much of what is said. If there is a time constraint, the interviewer should use some shorthand system that will preserve the essence of the respondent's replies without converting them into the interviewer's paraphrases. Abbreviating words, leaving out articles and prepositions, and using only key words are good ways to do this.

Another technique is for the interviewer to repeat the response while writing it down. This helps to hold the respondent's interest during the writing and checks the interviewer understands of what the respondent said. Normally the interviewer should start the writing when the respondent begins to reply. The interviewer should also record all probes and other comments on the questionnaire in parentheses to set them off from responses.

Study designers sometimes create a special interview instrument for recording respondent answers. This may be integrated with the interview questions or a separate document. In such instances the likely answers are anticipated, allowing the interviewer to check respondent answers or to record ranks or ratings. However, all interview instruments must permit the entry of unexpected responses.

Interview problems In personal interviewing, the researcher must deal with bias and cost. While each is discussed separately, they are interrelated. Biased results grow out of three types of error: sampling error, non response error and response error.

1. Non response Error In personal interviews, **non response error** occurs when you cannot locate the person whom you are supposed to study or when you are unsuccessful in encouraging the person to participate. This is an especially difficult problem when you are using a probability sample of subjects. If there are pre designated persons to be interviewed; the task is to find them, and if you are forced to interview substitutes, an unknown but possibly substantial bias is introduced. One study of non response found that only 31 percent of all first calls (and 20 percent of all first call in major metropolitan areas) were completed.

The most reliable solution to non response problems is to make **callbacks.** If enough attempts are made, it is usually possible to contact most target respondents, although unlimited callbacks are expensive.

An original contact plus three callbacks should usually secure about 85 percent of the target respondents. Yet in one study, 36 percent of central city residents still were not contacted after three callbacks.

2. Response Error When the data reported differ from the actual data, **response error** occurs. There are many ways these errors can happen. Errors can be made in the processing and tabulating of data. Errors occur when the respondent fails to report fully and accurately.

3. Interviewer error is also a major source of response bias.

1. The sample loses credibility and is likely to be biased if interviewers do not do a good job of enlisting respondent cooperation.

Perhaps the most insidious form of interviewer error is cheating. Surveying is difficult work, often done by part-time employees, usually with only limited training and under little direct supervision. At times, falsification of an answer to an overlooked question is perceived as an easy solution to counterbalance the incomplete data. This seemingly easy, seemingly harmless first step can be followed by more pervasive forgery. It is not known how much of this occurs, but it should be of constant concern to research directors as they develop their data collection design.

It is also obvious that an interviewer can distort the results of any survey by in-appropriate suggestions, word emphasis, tone of voice, and question rephrasing. These activities, whether premeditated or merely due to carelessness, are widespread.

Interviewers can influence respondents in many other ways also. Older interviewers are often seen as authority figures by young respondents, who modify their responses accordingly.

Some research indicates that perceived social distance between interviewer and respondent has a distorting effect, although the studies do not fully agree on just what this relationship is. In the light of the numerous studies on the various aspects of interview bias, the safest course for researchers is to recognize that there is a constant potential for response error.

Costs While professional interviewer's wage scales are typically not high, interviewing is costly, and these costs continue to rise. Much of the cost results from the substantial interviewer time taken up with administrative and travel tasks. Respondents are often geographically scattered, and this adds to the cost. Repeated contacts (recommended at six to nine per household) are expensive.

In recent years, some professional research organizations have attempted to gain control of these spiraling costs. Interviewers have typically been paid an hourly rate, but this method rewards inefficient interviewers and often results in field costs exceeding budgets. A seocnd approach to the reduction of field costs has been to use the telephone to schedule personal interviews. A third means of reducing high field costs is to use self-administered questionnaires.

1. Telephone Interview

The telephone can be helpful in arranging personal interviews and screening large populations for unusual types of respondents. Studies have also shown that making prior notification calls can improve the response rates of mail surveys. However, the telephone interview makes its greatest contribution in survey work as a unique mode of communication to collect information from respondents.

When compared to either personal interviews or mail surveys, the use of telephones brings a faster completion of a study, sometimes taking only a day or so for the fieldwork. When compared to personal interviewing, it is also likely that interviewer bias, especially bias caused by the physical appearance, body language, and actions of the interviewer, is reduced by using phones.

Finally, behavioral norms work to the advantage of telephone interviewing: If someone is present, a ringing phone is usually answered, and it is the caller who decides the purpose, length, and termination of the call.

There are also disadvantages to using the telephone for research; obviously, the respondent must be available by phone. Usage rates are not as high in households composed of single adults, less educated, poorer minorities, and individuals employed as non-professional, non-managerial workers. These variations can be a source of bias.

A limit on interview length is another disadvantage of the telephone, but the degree of this limitation depends on the respondent's interest in the topic. Ten minutes has generally been thought as ideal, but interviews of 20 minutes or more are not uncommon.

In telephone interviewing, it is not possible to use maps, illustrations, other visual aids, complex scales, or measurement techniques. The medium also limits the complexity of the questioning and the use of sorting techniques. One ingenious solution to not using scales, however, has been to employ a nine-point scaling approach and to ask the respondent to visualize this by using the telephone dial or keypad.

Some studies suggest the responses rate in telephone studies is lower than for comparable face-to-face interviews. One reason is that respondents find it easier to terminate a phone interview.

Telephone surveys can result in less thorough responses, and those involved by phone find the experience to be less rewarding to them than a personal interview. Respondents report less rapport with telephone interviewers that with personal interviewers. Given the growing costs and difficulties of personal interviews, it is likely that an even higher share of surveys will be by telephone in the future. Thus, it behooves management researchers using telephone surveys to attempt to improve the enjoyment of the interview. One authority suggests:

> *We need to experiment with techniques to improve the enjoyment of the interview by the respondent, maximizing the overall completion rate, and minimize response error on specific measures. This work might fruitfully begin with efforts at translating into verbal frowns, rising of eyebrows, eye contact, etc. All of these cues have informational content and are important parts of personal interview setting. We can perhaps purposefully choose those cues that are most important to data quality and respondent trust and discard the many that are extraneous to the survey interaction.*

2. **Self Administered Surveys**

The self-administered questionnaire has become ubiquitous in modern living. Service evaluations of hotels, restaurants, car dealerships, and transportation providers furnish ready examples. Often a short questionnaire is left to be completed by the respondent in a convenient location or is packaged with a product.

Mail Surveys

Mail surveys typically cost less than personal interviews/Telephone and mail costs are in the same general range, although in specific cases either may be lower. The more geographically dispersed the sample, the more likely it is that mail will be the low-cost method. A mail is that we can contact respondents who might otherwise be inaccessible. People such as major corporate executive are difficult to reach in any other way. When the research has no specific person to contact – say, in a study of corporation – the mail survey often will be routed to the appropriate respondent.

In a mail survey, the respondent can take more time to collect facts; talk with other, or consider replies at length than is possible with the telephone, personal interview, or intercept studies. Mail surveys are typically perceived as more impersonal, providing more anonymity than the other communication modes, including other methods for distributing self-administered questionnaires.

- The major weakness of the mail survey is non-response error. Many studies have shown that better-educated respondents and those more interested in the topic answer mail surveys. A high percentage of those who reply to a given survey have usually replied to others, while large shares of those who do not respond are habitual non-respondents.
- Mail surveys with a return of about 30% are often considered satisfactory, but there are instances of more than 70% response. In either case, there are many non-responders, and we usually know nothing about how those who answer differ from those who do not answer.

- The second major limitation of mail surveys concerns the type and amount of information that can be secured. We normally do not expect to obtain large amounts of information and cannot probe deeply into questions. Respondents will generally refuse to co-operate with a long and/or complex mail questionnaire unless they perceive a personal benefit. Returned mail questionnaires with many questions left unanswered testify to this problem, but there are also many exceptions. One general rule of thumb is that the respondent should be able to answer the questionnaire in no more than 10 minutes.

3. **Maximizing the Mail Survey**

To maximize the overall probability of response, attention must be given to each point of th survey process where the response may break down, for example:

- The wrong address and wrong postage can result in non-delivery or non-return.
- The letter may look like junk mail and be discarded without being opened.
- Lack of proper instructions for completion leads to non-response.
- The wrong person opens the letter and fails to call it to the attention of the right person.
- A respondent finds no convincing explanation for completing the survey and discards it.
- A respondent temporarily sets the questionnaire aside and fails to complete it.
- The return address is lost so the questionnaire cannot be returned.

Efforts to overcome these problems will vary according to the circumstances, but some general suggestions can be made for mail survey, and, by extension, for self-administered questionnaires using different delivery modes. A questionnaire, cover letter, and return mechanism are sent. Incentives, such as dollar bills, coins or gift coupons are often attached to the letter in commercial studies. Follow-ups are usually needed to get the maximum response. Opinions differ about the number and timing of follow-ups.

5.3 Research Instruments

1. The Questionnaire

A questionnaire can be defined as a group of printed questions which have been deliberately designed and structured to be used to gather information from respondents.

Advantages of using Questionnaire

1. *They can be used to reach many people.*
2. *Save time, especially where they have been mailed to respondents.*
3. *Cost effective given they can be mailed and one can avoid using interviewers.*
4. *Questions are standardized and therefore the responses are likely to be the same.*
5. *Interviewer biases can be avoided when questionnaires are mailed.*
6. *They give a greater feeling of being anonymous and therefore encourage open responses to sensitive questions.*

7. *Effective in reaching distant locations where it is not practical to go there.*

Disadvantages

1. *Questionnaire mailed to respondents may not be returned.*
2. *The inability to control the context of questions answering and specifically the presence of other people who may fill the questionnaire.*
3. *A certain number of potential respondents, particularly the least educated maybe unable to respond to written questionnaires because of illiteracy and other difficulties in reading.*
4. *Written questionnaires do not allow the researchers to correct mis-understanding or answer questions that the respondent may have.*
5. *Source questionnaire may be returned half filled or unanswered.*

Guidelines for Asking Questions

In the actual practice of social research-variables are usually operationalized by asking people questions as a way of getting data for analysis and interpretation. That is always the case in survey research, and such 'self-report' date are often collected in experiments, field research, and other modes of observation. Sometimes the questions are asked by the interviewer, sometimes they are written down and given to respondents for completion (they are called administered questionnaire).

The term ***questionnaire*** suggests a collection of questions, but an examination of a typical questionnaire will probably reveal as many statements as questions. That is not without reason. Often, the researcher is interested in determining the extent to which respondents hold a particular attitude or perspective. If you are able to summarize the attitude in a fairly brief statement, you will often present that statement and ask respondents whether they agree or disagree with it – Rensis Likert scale, - a format where respondents are asked to strongly agree, agree, disagree, or strongly disagree, or perhaps strongly approve, approve, and so fourth.

Open-Ended and Closed-Ended Questions

Open-ended questions

The respondent in asked to provide his or her own answer to the questions eg. ('What do you feel is the most important issue facing Kenya today?) and provided with a space to write in the answer (or be asked to report in verbally to an interviewer)

Closed-ended Questions

The respondents are asked to select an answer from among a list provided by the researcher. Closed-ended questions are very popular because they provide a greater conformity of responses and are more easily processed. Open-ended responses must be coded before they can be processed for computer analysis. This coding process often requires that the researcher interpret the meaning of responses, opening the possibility of misunderstanding and researcher bias. There is also a danger that some respondents will give answers that are essentially irrelevant to the researcher's intent. Closed-ended questions can often be transferred directly into computer format.

The chief shortcoming of closed-ended questions lies in the researcher's structuring of responses. In asking about 'the most important issue facing Kenya, for example, your check-list of issues might omit certain issues that respondents would have said were important.

In the construction of closed-ended questions, the response categories provided should be exhaustive. (They should include all the possible responses that might be expected) – (Please specify ……). Second, the answer categories must be *mutually exclusive* : (In some cases you may wish to solicit multiple answers, but these may create difficulties in data processing and analysis later on).

Make Items Clear

Questionnaire items should be clear and unambiguous. Often you can become so deeply involved in the topic under examination that opinions and perspectives are clear to you but will not be clear to your respondents – many of whom have given little or no attention to the topic. Or if you have only a superficial understanding of the topic, you may fail to specify the intent of your question sufficiently. The question 'what do you think about the 'proposed nuclear freeze?' may evoke in the respondent a counter question: 'which nuclear freeze proposal?' Questionnaire items should be precise so that the respondent knows exactly what the researcher wants an answer to.

Avoid Double-Barreled Questions

Frequently, researchers ask respondents a single answer to a combination of questions. That seems to happen most after when the researcher has personally identified with a complex question. For example, you might ask respondents to agree or disagree with a statement. 'The United States should abandon its space program and spend the money on domestic programs'. Although many people would unequivocally agree with the

statement and others would unequivocally disagree, still others would be unable to answer. Some would want to abandon the space program and give the money back to the taxpayers. Other would want to continue the program but also put more money into domestic programs. These latter respondents could neither agree nor disagree without misleading you.

Respondents must be Competent to Answer

In asking respondents to provide information, you should continually ask yourself whether they are able to do so reliably. In the study of child rearing, you might ask respondents to report the age at which they first talked back to their parents. Quite aside from the problem of defining talking back to parents, it is doubtful if most respondents would remember with any degree of accuracy.

One group of researchers examining the driving experience of teenagers insisted on asking an open-ended question concerning the number of miles driven since receiving a license. Although consultants argued that few drivers would be able to estimate such information with any accuracy, the question was asked nonetheless. In response, some teenagers reported driving hundreds of thousands of miles.

Questions should be Relevant

When attitudes are requested on a topic that few respondents have though about or really cared about, the results are not likely to be very useful. This point is illustrated occasionally when you ask for responses relating to fictitious persons and issues. In a potential poll conducted, respondents were asked whether they were familiar with each of 15 political figures in the community. As a methodological exercise, a name was made up: John Maina. In response, 9% of the respondents said they were familiar with him. Of those respondents familiar with him, about half reported seeing him on television and reading about him in the newspapers.

When you obtain responses to fictitious issues, you can disregard those responses. But when the issue is real, you may have no way of telling which responses genuinely reflect attitudes and which reflect meaningless answers to irrelevant questions.

Short Items are best

In the interest of being unambiguous and precise and pointing to the relevance of an issue, the researcher is often led into long and complicated items. That should be avoided. Respondents are often unwilling to study an item in order to understand it. The respondent should be able to read an item quickly, understand its intent, and select or provide an answer without difficulty. Provide clear, short items that will not be misinterpreted under those conditions.

Avoid Negative Items

The appearance of a negative item in a questionnaire paves way for early misinterpretation. Asked to agree or disagree with the statement. 'The United States should not recognize Cuba', a sizeable portion of the respondents will read over the word not and answer on that basis. Thus, some will agree with the statement when they are in favor of recognition, and other will agree when they oppose it. Any you may never know which is which.

Avoid Biased Items and Terms

The meaning of some one's response to a question depends in large part on the wording of the question that was asked. That is true of every question and answer. Some questions seem to encourage particular responses more than other questions. Questions that encourage respondents to answer in a particular way are called biased.

Most researchers recognize the likely effect of a question that begins 'don't you agree with the president that….' And no reputable researcher would use such an item. Unhappily the biasing effect of items and terms is far subtler than this example suggests.

The mere identification of an attitude or position with a prestigious person or agency can bias responses. The item '*do you agree or disagree with the recent supreme court decision that*…' would have similar effect. It does not mean that such wording will necessarily produce consensus or even a majority in support of the position identified with the prestigious person or agency, only that support would likely be increased over what would have been obtained without such identification.

Questionnaire items can be biased negatively as well as positively. 'Do you agree or disagree with the position of Adolf Hitler when he stated that…..' is an example. Since 1949, asking Americans questions about China has been tricky. Identifying the country as 'China' can still result in confusion between mainland China and Taiwan. Not all Americans recognize the official name: The People's Republic of China. Referring to 'Red China' or Communist China' evokes negative response from many respondents, though that might be desirable if your purpose were to study anti communist feelings.

Questionnaire Construction

Questionnaires are essential to and most directly associated with surveys research. They are also widely used in experiments, field research, and other data – collection activities. Thus questionnaires are used in connection with modes of observation in social research.

Response Strategies Illustrated

The characteristics of respondents, the nature of topic(s) being studied, the type of data needed, and your analysis plan dictate the response strategy. Example of the strategies described below are found in Table 10.1

Free-Response Questions: also known as *open-ended questions*, ask the respondent a question, and the interviewer pauses for the answer (which is unaided), or the respondent records his or her ideas in his or her own words in the space provided on a questionnaire.

Dichotomous Response Questions: A topic may present clearly dichotomous choices: something is a fact or it is not; a respondent can either recall or not recall information; a respondent attended or didn't attend an event.

Multiple-Choice Questions: are appropriate where there are more than two alternatives or where we seek gradations of preference, interest, or agreement; the latter situation also calls for rating questions. While such questions offer more than one alternative answer, they request the respondent to make a single choice. Multiple-choice questions can be efficient, but they also present unique design problems.

Table 5.0
Alternative Response Strategies

Free response	what factors influenced your enrollment in Metro U
Dichotomous	Did you attend either of the "A Day at College" Programs At?
Selection	Mount Kenya University
	☐ Yes ☐ No
(Paired comparison	
Dichotomous selection) in your decision to attend Mount Kenya, which was more influential; the	
	Semester, calendar or the many friends attending from your home Town.
	☐ Semester Calendar
	☐ Many friends attending from home town
Multichoice	Which one of the following factors was in your decision to attend Mount Kenya University?

☐ Good academic reputation

☐ Specific program of study

☐ Enjoyable campus life

☐ High quality of the faculty

☐ Many friends from home attend

Checklist

Which of the following factors encouraged you to apply to Mount Kenya University?

(Check all that apply)

☐ Tuition cost

☐ Specific program of study desired

☐ Opinion of brother or sister

☐ Many friends from home attend

☐ High school counselor's recommendation

☐ High quality of the faculty

☐ Good academic reputation

☐ Enjoyable campus life

☐ Closeness to home

Rating

Each of the following factors has been shown to have some influence on a student's choice in applying Mount Kenya University. Using your own experience for each factor please tell us whether the factor was 'strongly influential,' 'somewhat influential,' or 'not at all influential'.

	Strongly Influential	Somewhat influential	Not at all influential
Good academic reputation	☐	☐	☐
Enjoyable campus life	☐	☐	☐
Many friends from home attend	☐	☐	☐
High quality of the faculty	☐	☐	☐
Semester calendar	☐	☐	☐

Ranking

Please rank-order your top three factors from the following list based on their influence in encouraging you to apply to Mount Kenya University. Use 1 to indicate the most encouraging factor, 2 the next most encouraging factor, etc.

_____ Closeness to home

_____ Enjoyable campus life

_____ Good academic reputation
_____ High quality of the faculty
_____ High school counselor's recommendation
_____ Many friends from home
_____ Opinion of brother or sister
_____ Parent's preferences
_____ Specific program of study desired
_____ Tution cost.

Checklist Strategies

When you want a respondent to give multiple responses to a single question, you will ask the question in one of three ways. If relative order is not important, the checklist is the logical choice. Questions like "Which of the following factors encouraged you to apply to Mount Kenya University (Check all that apply). Force the respondent to exercise a dichotomous response (yes, encouraged; no, didn't encourage) to each factor presented. Of course you cold have asked for the same information as a series of dichotomous selection questions, one for each individual factor, but that would have been time-consuming. Checklists are more efficient. Checklists generate nominal data.

Rating Strategies

Rating questions ask the respondent to position each factor on a companion scale, verbal, numeric, or graphic. 'Each of the following factors has been shown to have some influence on a student's choice to apply to Mount Kenya University. Using your own experience, for each factor please tell us whether the factor was 'strongly influential', 'somewhat influential', or 'not at all influential'. Generally, rating-scale structures generate ordinal data; some carefully crafted scales generate interval data.

Ranking Strategies

When relative order of the alternatives is important, the ranking question is ideal. 'Please rank-order your top three factors from the following list based on their influence in encouraging you to apply to Mount Kenya University. Use 1 to indicate the most encouraging factor, 2 the next most encouraging factor, etc. The checklist strategy would provide the three factors of influence, but we would have no way of knowing the importance the respondent places on each factor. Even in a personal interview, the order in which the factors are mentioned is not a guarantee of influence. Ranking as a response strategy solves this problem.

Instructions

Instructions to the interviewer to respondent attempt to ensure that all respondents are treated equally, thus avoiding building error into the results. Two principles form the foundation for good instructions: clarity and courtesy. Instruction language needs to be unfailingly simple and polite.

Instruction topics include (1) how to terminate an interview when the respondent does not correctly answer the screen or filter questions, (2) How to conclude an interview when the respondent decides to discontinue, (3) Skip directions for moving between top sections of an instrument when movement is dependent on the answer to specific questions or when branched questions are used, and (4) Telling the respondent to a self-administered instrument about the disposition of the completed questionnaire. In a self-administered questionnaire, instructions must be contained withn the survey instrument. Personal interviewer instructions sometimes are in a document separate from the questionnaire (a document thoroughly discussed during interviewer training) or are distinctly and clearly marked (high-lighted, printed in a colored ink, or boxed on the computer screen) on the data collection instrument itself.

Conclusion

The role of the conclusons is to leave the respondent with the impression that his or her participation has been valuable. Subsequent researchers may need this individual to participate in new studies. If every interviewer or instrument expresses appreciation for participation, co-operation in subsequent studies is more likely.

5.4 Review Questions

1. What are the main advantages associated with obtaining information by questioning or by observation?

2. Distinguish among response error, interviewer error, and non response error.

3. How do environmental factors affect response rates in personal interviews? How can we overcome these environmental problems?

4. One design problem in the development of survey instruments concerns the sequence of questions. What suggestions would you give to people designing their first questionnaire?

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TOPIC SIX

DATA ANALYSIS

OBJECTIVES

By the end of this lecture, students should be able to:

1. Distinguish between coding and editing.
2. Explain the process of tabulation.
3. Describe hypothesis testing.
4. Describe the various parametric and nonparametric tests.

6.0 Analysis and Presentation of Data

Once the data begin to flow in, attention turns to data analysis. The steps followed in data collection influence the choice of data analysis techniques. The main preliminary steps that are common to many studies are:

- Editing
- Coding and
- Tabulation

(i) Editing

Editing involves checking the raw data to eliminate errors or points of confusion in data. The main purpose of editing is to set quality standards on the raw data, so that the analysis can take place with minimum of confusion. In other words, editing detects errors and omissions, corrects them when possible and certifies that minimum data quality standards are achieved. The editor's purpose is to guarantee that data are:

- Accurate
- Consistent with other information
- Uniformly entered
- Complete and
- Arranged to simplify coding and tabulation.

In the following questions asked of military officers, one respondent checked two categories, indicating that he was in the reserves and currently serving on active duty.

Please indicate your current military status:

- ☐ Active duty officer
- ☐ National Guard officer
- ☐ Reserve officer
- ☐ Separated officer
- ☐ Retired officer

The editor's responsibility is to decide which of the responses is consistent with the intent of the question or other information in the survey and is most accurate for this individual respondent. There are two stages in editing:

(i) the field edit

(ii) the central office edit

(i) The Field Edit

Field edit is the preliminary edit whose main purpose is to detect the obvious inaccuracies and omissions in the data. This also helps the researcher to control the fieldworkers and to clear misunderstandings of the procedures and of specific questions.

The best arrangement is to have the field edit conducted soon after the data collection form has been administered. The following items are checked in the field edit:

a) *Completeness*: Checking the data form to ensure that all the questions have been answered. The respondent may refuse to answer some questions or may just not notice them.

b) *Legibility*: A questionnaire may be difficult to read owing to the interviewer's handwriting or the uses of abbreviations not understood by respondents.

c) *Clarity*: A response may be difficult for others to comprehend but the interviewer can easily clarify it, if asked in good time.

d) *Consistency*: The responses provided may also lack consistency. These can be corrected by the fieldworker if detected early.

In large projects, field editing review is a responsibility of the field supervisor. It, too, should be done soon after the data have been gathered. A second important control function of the field supervisor is to *validate the field results*. This normally means s/he will re-interview some percentage of the respondent, at least on some questions.

(ii) Central Editing

This comes after the field edit. At this point, data should get a thorough editing. Sometimes it is obvious that an entry is incorrect, is entered in the wrong place or states time in months when it was requested in weeks. A more difficult problem concerns faking; Arm chair interviewing is difficult to spot, but the editor is in the best position to do so. One approach is to check responses to open-ended questions. These are the most difficult to fake. Distinctive response patterns in other questions will often emerge if faking is occuring. To uncover this, the editor must analyse the instruments used by each interviewer.

2. Coding

It involves assigning numbers or other symbols to answers so the responses can be grouped into a limited number of classes or categories. The classifying of data into limited categories sacrifices some data detail but is necessary for efficient analysis. Instead of requesting the work male or female in response to a question that asks for the identification of one's gender, we could use the codes 'M' or 'F'. Normally, this variable would be coded 1 for male and 2 for female or 0 and 1.

Coding helps the researcher to reduce several thousand replies to a few categories containing the critical information needed for analysis.

The first step involves the attempt to determine the appropriate categories into which the responses are to be placed. Since multiple choice and dichotomous questionnaire have specified alternative responses, coding the responses of such questions is easy. It simply involves assigning a different numerical code to each different response category.

Open questions present different kinds of problems for the editors. The editor has to categorise the responses first and then each question is reviewed to identify the category into which it is to be placed. There is a problem in that there can be a very wide range of responses, some of which are not anticipated at all. To ensure consistency in coding, the task of coding should be apportioned by questions and not by questionnaires. That is, one person may handle question one to six, in all the questionnaires instead of dividing the coding exercise by questionnaires. The next step involves assigning the code numbers to the established categories.

For example, a question may demand that a respondent lists the factors s/he consideres when buying a pair of shoes. The respondent is free to indicate anything s/he thinks of. The responses may range from colour, size, comfort, price, materials, quality, durability, style, uniqueness and manufacturer among others. The response may have to be coded into just three or four categories and each response has to be placed within a specific category and coded as such.

The 'don't know' (DK) response presents special problems for data preparation. When the DK response group is small, it is not troublesome. But there are times when it is of mjaor concern,

and it may even be the most frequent response received. Does this mean the question that elicited this response is useless? It all depends. But the best way to deal with undesired DK answer is to design better questions at the beginning.

3. Tabulation

This consists of counting the number of responses that fit in each category. The tabulation may take the form of simple tabulation or cross tabulation.

- Simple tabulation involves counting a single variable. This may be done for each of the variables of the study. Each variable is independent of the others.
- In gross tabulation two or more variables are handled simultaneously. This may be done by hand or machine.

Where hand tabulation is used, a tally sheet is used. For example, if the question read: How many cigarettes do you smoke in a day?

The tally for a sample of size 35 would look like this:

Classes	Code	Tally	Frequency
0	1	||||	4
1-5	2	~~||||~~ ||	7
6-10	3	~~||||~~ ~~||||~~ |||	13
11-15	4	~~||||~~ ||	7
15 and over	5	||||	4

Cross tabulation can be created when we combine the number of cigarettes smoked in a day with the age of the respondent.

This can be done to establish the relationships between the number of cigarettes smoked and age. The table below shows the cross tabulation for the variables.

	Age of respondents					Total
No of cigarettes smoked	15-20	21-25	26-30	31-35	36+	
1	||	|		|		4
2	|||	||	|	|		7
3	|	|||	|||	~~||||~~	|	13
4			|	|||	|||	7
5				|||	|	4
Totals	6	6	5	13	5	35

The cross tabulations indicate for example, that all the respondents smoking more than 5 cigarettes a day are in the 36 and over years of age category.

This kind of tabulation is only useful in very simple studies involving a few questions and a limited number of responses. Most studies involve large numbers of respondents and many items to be analysed and these generally rely on computer tabulation. There are many packaged programmes for studies in the social sciences.

A note on the use of summary statistics

Researchers frequently use summary statistics to present survey findings. The most commonly used summary statistics include:

- ✓ Measures of central tendency (mean median and mode).
- ✓ Measures of dispersion (variance, standard deviation, range, interquartile range).
- ✓ Measures of shape (skewness and kurtosis).
- ✓ We can also use percentages.

These are all summary statistics that are only substitutes for more detailed data. They enable the researchers to generalise about the sample of study objects. It should be noted that these summary statistics are only helpful if they accurately represented the sample.

One can also use some useful techniques for displaying the data. These include frequency tables, bar charts, and piecharts, etc.

6.1 Hypothesis Testing

There are two approaches to hypothesis testing. The more established is the classical or sampling theory approach; the second is known as the Bayesian approach. Classical statistics are found in all of the major statistics books and are widely used in research applications. This approach represents an objective view of probability in which the decision making rests totally on an analysis of available sampling data. A hypothesis is established, it is rejected or fails to be rejected, based on the sample data collected.

In classical tests of significance, two kinds of hypothesis are used:

(i) The null hypothesis denoted H_o; is a statement that no difference exists between the parameter and the statistic being compared.

(ii) The alternative hypothesis denoted H_1; is the logical opposite of the null hypothesis.

The alternative hypothesis – denoted (H_1) may take several forms, depending on the objective of the researchers. The H_1 may be of the 'not the same' form (nondirectional). A second variety may be of the 'greater than' or 'less than' form (directional).

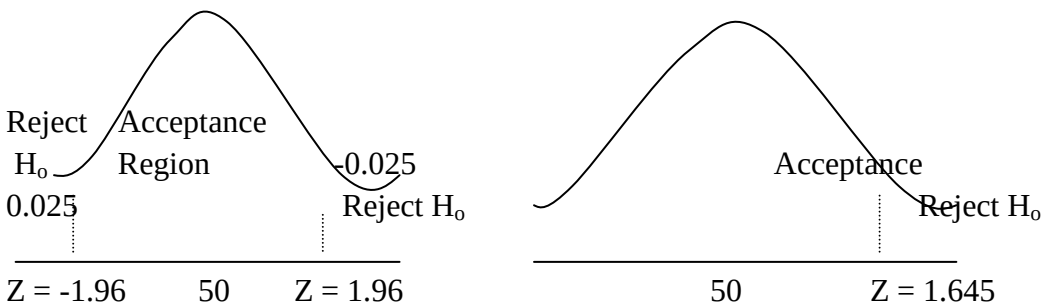
These types of alternative hypothesis correspond with two-tailed and one tailed tests.

- *A two-tailed test, or nondirectional test*, consideres two possibilities: The average could be 'more than' or it could be 'less than'. To test hypothesis, the region of rejection are divided into two tails of the distribution.
- *A one-tailed test, or directional test*, places the entire probability of an unlikely outcome into the tail specified by the alternative hypothesis.

In figure 9.0, the first diagram represents a nondirectional hypothesis, and the second is a directional hypothesis of the 'greater than' variety. Hypothesis may be expressed in the following form:

Null	H_o: u (mu)	= 50 days.
Alternative	$H_{1:}$ u	≠ 50 days (not the same case)
Or	$H_{1:}$ u	> 50 days (greater than case)
Or	$H_{1:}$ u	< 50 days (less than case).

Figure 9.0 one and two tailed tests at the 5% level.



<u>Note:</u>

A type I error is committed when a true hypothesis is rejected and a type II error is committed when one fails to reject a false null hypothesis.

<u>Statistical Testing Procedures:</u>

(i) State the null hypothesis.

(ii) Choose the statistical test.

(iii) Select the desired level of significance. ∝ 0.05 ∝ 0.01.

(iv) Compute the calculated difference value.

(v) Obtain the critical test value, ie, t, z, or x^2.

(vi) Make the decision. For most tests if the calculated value is larger than critical value, we reject the null hypothesis and conclude that the alternative hypothesis is supported (although it is by no means proved).

A Note on Tests of Significance

There are two general classes of significance tests, parametric and nonparametric.

- Parametric tests are more powerful because their data are derived from interval and ratio measurements.
- Nonparametric tests are used to test hypothesis with nominal and ordinal data.

Parametric Tests

The Z or t test is used to determine the statistical significance between a sample distribution mean and a parameter. The Z distribution and t distribution differ (the latter is used for large samples, ie, greater than 30). But when sample sizes approach 120, the sample standard deviation becomes a very good estimate of the population standard deviation; beyond 120, the t and Z distributions are virtually identical.

One-Sample Tests:

These are used when we have a single sample and wish to test the hypothesis that it comes from a specified population. In this case, we encounter questions such as these:

a) Is there a difference between observed frequencies and the frequencies we would expect, based on some theory?
b) Is there a difference between observed and expected proportions?
c) Is it reasonable to conclude that a sample is drawn from a population with some specified distribution (normal, poison, and so forth)?
d) Is there significant difference between some measure of central tendency (x) and its population parameter (u)?

For example:

A machine fills packets with spice which are supposed to have a mean weight of 40 grams. A random sample of 36 packets is taken and the mean weight is found to be 42.2 grams with a standard deviation of 6 grams. It is required to conduct a significance test at the 5% level.

This significance test is conducted by following the six-step procedure recommended earlier.

1. Null Hypothesis $H_{0:}$ u = 40 grams

   $H_{1:}$ u ≠ 40 grams (a two tail test)

   $\overline{x}$ = 42.4 grams (given)

   s = 6 grams (given)

   n = 36 grams (given)

Where:

$\overline{x}$ = sample mean

u = population mean

s = standard deviation

n = sample size (greater than 30)

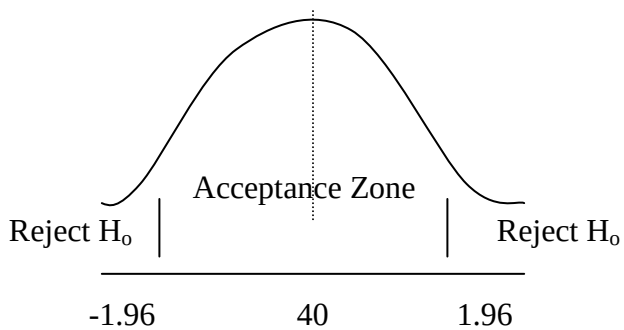
2. Statistical test: Select the Z test because sample size is greater than 30.

3. Significance level: ∝ 0.05, and n = 36.

4. Calculated value: first compute standard error $\bar{=}$ $Sx = \frac{S}{n} = \frac{6}{36} = 1$

$$Z = \frac{\bar{x}-u}{S\bar{x}} = \frac{42.4-40}{1} = \frac{2.24}{}$$

5. Critical test. At the 5% significance level the Z value must be within ±1.96, ie, (obtain from normal tables).



6. Decision: In this case, the calculated value (2.24) is greater than the critical value (1.96) ie, (2.24>1.96), so we reject the null hypothesis and conclude that the difference between the sample mean and the hypothetical population mean is significance at the 5% level.

If we use a 1% level of significance.

$H_{o:}$ u = 40 grams

$H_{1:}$ u ≠ 40 grams

$\bar{x}$ = 42.4 grams

s = 6 grams

n = 36 grams

$\therefore S\bar{x} = \frac{6}{36} = 1$

$\therefore Z = \frac{42.4-40}{1} = 2.24$

At the 1% level Z must be within ± 2.58.

∴ As the calculated score is within this value H_o can be accepted at the 1% level.

Ie, the difference between the sample mean and the hypothetical population mean is not significant at the 1% level.

Notes:

(i) It is important to realise that if the null hypothesis is accepted, this is not proof that the assumed population mean is correct. Testing a hypothesis may only show that an assumed value is probably false.

(ii) It will be apparent from the two examples that the 1% level of significance is a more severe test than the 5% level. The greater the level of significance, the greater the probability of making a Type I error.

Non-Parametric Tests

Probably the most widely used non-parametric test of significance is the chi-square (x^2) test. This test does not make any assumption about the distribution from which the sample is taken. The x^2 test is an important extention of hypothesis testing and is used when it is wished to compare an actual, observed distribution with a hypothesised or expected distribution. It is often referred to as a 'goodness of fit' test.

The formula for the calculation of x^2 is as follows: $x^2 = \sum \frac{(O-E)^2}{E}$

Where O = the observed frequency of any value.

E = the expected frequency of any value.

Procedure:

1. Null hypothesis $H_o : O = E$

   $H_{1:}\ O \neq E$
2. Statistical test: Use the one-sample x^2 to compare the observed distribution to a hypothesized distribution.
3. Significance level: $\propto = 0.05$ or 0.01.
4. Calculated value: $x^2 = \sum \frac{(O-E)^2}{E}$
5. Critical test value: Locate the table critical values of x^2.
6. Decision: If the calculated value is greater than (less than) the critical value, reject null hypothesis (accept H_o).

6.2 Introduction Comments on Correlation and Regression Analysis

Correlation and regression analysis are complex mathematical techniques for studying the relationship between two or more variables. Correlation analysis involves measuring the closeness of the relationship between two or more variables. Regression analysis refers to

techniques used to derive an equation that relates the dependent variable to one or more independent variables. The dependent variable here refers to the variable being predicted. The independent variables are those that form the basis of the prediction – they are also called predictor variables

Correlation and regression techniques may be used in situations where both the dependent and independent variables are of the continuous type. When a survey data consists of a continuous dependent variable and one or more continuous independent variables, researchers may use the techniques of correlation and regression analysis.

A straight line is fundamentally the best way to model the relationship between two continuous variables. The bivariate linear regression may be expressed as: $Y = \beta_0 + \beta_0 X_I$

Where the value of the dependent variable Y is a linear function of the corresponding value of the independent variable (X)

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TOPIC SEVEN

PRESENTING RESULTS: WRITTEN AND ORAL REPORTS

OBJECTIVES

By the end of this lecture, you should be able to:

1. Explain the role of the research report.
2. Explain the criteria by which research reports are evaluated.
3. Describe the research report components.
4. Explain oral presentation.

7.0 Introduction

Report writing is the last step in the research process. After data have been collected, analysed and interpreted, the researcher has to prepare a report of the findings of the study. It may be seen unscientific and even unfair, but a poor report or presentation can destroy a study.

7.1 Role of the Research Report

The main role of the research report is to communicate the findings of the research project. The project should answer the questions raised in the statement of objectives of the study. The researcher should be clearly aware of the purpose of the research when preparing the report. A research project can bring out a lot of information but much of this information may not be relevant to the problem initially defined. Only information that is likely to be useful to the decision maker in decision making should be included in the report. The researcher will need to use his own judgement in deciding what information should be omitted.

For the report to be of maximum use to the decision maker, it must be objective. The researcher should therefore have the courage to present and defend their results as long as they are convinced that they are valid. They should also clearly indicate any limitations of the study.

7.2 Research Report Criteria

The main criteria by which research reports are evaluated are communication with the reader. The report is prepared for a specific purpose and for a specific type of audience. It should therefore communicate effectively with the intended audience.

The report should be written with due consideration for the readers, their level of interest in the subject, understanding of technical terms and what they will make of the report.

In order to tailor the report to meet the needs of the readers, the researcher should understand the readers' preferences. One may find that different readers have different preferences and this may at times bring conflicts. Some readers may want to have the basic information only while others prefer to have the technical details clearly brought out in the report. One way to reconcile these conflicting interests is to prepare a basic report with a minimum detail and to have appendices that give the technical details. Again, in some cases, the researcher may indicate that certainly details have been omitted but are available upon request.

Another point to consider regarding the report's ability to communicate with the intended reader is whether the reader has to keep referring to the dictionary as this may seriously interfere with the flow of information and thus affect communication.

7.3 Writing Criteria

A report should satisfy the following criteria to improve its chances of communicating effectively with the reader:

a) Completeness.
b) Accuracy
c) Clarity
d) Conciseness

Let us now discuss how each of these criteria enhances communication.

a) Completeness

A report should provide all the information that readers need in a language they understand. This means that the writer should continually ask himself whether all the issues in the research objectives have been addressed.

The report should not be too long as to include findings that are not relevant to the study. Yet, it should not be too short as to omit necessary definitions and explanations.

The abilities and interests of readers should be considered in determining completeness.

b) Accuracy

The preceding steps in the research process provide the basic input for the report. This means that the data generated at the data collection and analysis steps should be accurate in order for the report to be accurate.

c) Clarity

Writing clearly is not easy. Clarity is achieved by clear logical thinking and precision of expression. The way the report is organised may contribute to clarity or affect it negatively. Some principles of writing clearly are:

(i) Use short and simple sentences.
(ii) Use simple words which the reader is familiar with.
(iii) Ensure that words and phrases express exactly what the writer means to say.
(iv) Avoid grammatical errors.
(v) Use uniform style and format. It may help to write a first draft and then have another person review it before preparing the final report.

d) Conciseness

The criteria of completeness should not be complemented by conciseness. The writer should be concise in his writing and selective with regard to what to include in the report. The report should be brief and to the point – this means that the report should not include everything that has been found but only what is relevant to the study.

The writing style should render itself to conciseness. The findings should be expressed completely and clearly in the fewest words possible.

7.4 Report Format

The organisation of the report influences its ability to meet all the criteria of report writing. There is no format that is appropriate for all reports. A report should use a format that best fits the needs of its readers.

The following format may be used for most types of reports. It should be seen as flexible and open to changes and adjustments depending with needs of the reader.

1. Title page
2. Table of contents
3. Summary/Abstract/Executive Summary
4. Problem statement
5. Statement of objectives
6. Background
7. Research methodology
   a) Research design
   b) Data collection method

   c) Sampling
   d) Fieldwork
   e) Analysis and interpretation
8. Limitations of the study
9. Findings of the study
10. Summary and conclusions
11. Recommendations
12. Appendix
   a) Copies of data collection instruments.
   b) Details of sample size determination.
   c) Tables not included in the findings.
   d) Bibliography.

Let us briefly discuss each of these terms.

1. Title Page

The title page should indicate the subject of the report, the name of the organisation for whom the report is prepared, the name of organisation or person who prepared it and the date the report is prepared.

If the report is done by employees of the company, then the names of the people or departments preparing the report are given.

2. Table of Contents

As a rough guide, any report of several sections that totals more than 6 to 10 pages should have a table of contents.

This shows in order of appearance the topics and subtopics of the report with page references.
It also includes tables and charts and pages where they may be found.

3. Summary/Abstract

Some authors consider the summary to be the most important part of the report. This is mainly because most executives read only the summary or they us it to guide them on what areas of the report to give more attention. It should contain the necessary background information as well as the important findings and conclusions. Two pages are generally sufficient for executive summaries. Write this section after the rest of the report is finished.

4. Problem Statement

It contains the need for the research project. The problem is usually represented by research question(s). It is followed by a more detailed set of objectives.

5. Statement of Objectives

This states the objectives of the study and should clearly indicate the purpose of the study and what the report tries to answer.

6. Background

Background material may be of two types. It may be preliminary results of exploration from an experience survey, focus group, or another source. Alternatively, it could be secondary data from the literature review.

7. Research Methodology

This section describes the research procedures or methods used. It should indicate the research design, sampling procedures, data collection and data analysis procedures used.

This section provides information on the manner in which the findings reported were gathered, analysed and interpreted.

8. Limitations of the Study

This topic is often handled with ambivalence. Some people wish to ignore the matter, feeling that mentioning limitations detracts from the impact of the study. This attitude is unprofessional and possibly unethical.

Every research project has limitations and the research should call the readers attention to them. This gives the reader a more accurate picture of the study and helps him to interprete the findings more objectively.

9. Findings of the Study

In this section which makes the bulk of the report, the results of the study are presented. The specific objectives of the study should be kept in mind and the results should be presented in a logical manner. Only information that contributes to answering the questions posed in the study objectives should be reported. Tables, charts and figures should be presented in a logical manner to facilitate flow of thought and appreciation.

10. Summary and Conclusions

The summary is a brief statement of the essential findings. Sectional summaries may be used if there are many specific findings. They may be combined into an overall summary. In simple, descriptive research, a summary may complete the report, because conclusions and recommendations may not be required.

Findings state facts, conclusions represent inferences drawn from the findings. Conclusions should be drawn with reference to the objectives of the study. The researcher should show the step by step development of conclusions and state them with some detail.

Conclusions may be presented in a tabular form for easy reading and reference.
If for some reason the study does not obtain adequate data on which to make conclusions, this should be acknowledged.

11. Recommendations

There are usually a few ideas about corrective actions. In academic research, the recommendations are often further study suggestions that broaden or test understanding of the subject area. In applied research the recommendations will usually be for managerial action rather than research action. The writer may offer several alternatives with justifications.
It is therefore, not always possible or necessary to make recommendations. However, in some cases, the researcher may be asked to make recommendations. In this case, he will need further information on the background of the organisation and its policies.

Appendix

The appendix provides a place for material that does not fit in the other parts of the research report. This may be because its too detailed, technical or specialized, or is not absolutely necessary for the text.

The appendix normally contains details on sample design and sample size determination, an exhibit copy of the data collection instrument; maps used to draw up the sample; detailed statistical tables and figures. The appendix helps those interested in the technical details to find them easily.

7.5 Presentation of Statistics

The presentation of statistics in research reports is a special challenge for writers. Four basic ways to present such data are in (1) a text paragraph, (2) semitabular form, (3) tables, or (4) graphics.

1. Text Presentation

This is probably the most common when there are only a few statistics. The writer can direct the reader's attention to certain numbers or comparisons and emphasize specific points. The drawback is that the statistics are submerged in the text, requiring the reader to scan the entire paragraph to extract the meaning. The following material has a few simple comparisons but becomes more complicated when text and statistics are combined.

A comparison of the three aerospace and defense companies from the high-tech stratum of the Forbes 500 sample show that Sundstrand had the best sales growth record over the years 1988-1989. Its growth was 8.0 percent – with sales significantly lower than the other two firms in the sample. This compares to sales growth for Rockwell International of 3.3 percent, and Allied-Signal was third at only 0.8 percent sales increase. Rockwell International generated the most profits in 1989 among the three companies. Rockwell's net profits were $720.7 million as compared to $528 million for Allied-Signal and $120.8 million for Sundstrand.

2. Semitabular Presentation

When there are just a few figures, they may be taken from the text and listed. Lists of quantitative comparisons are much easier to read and understand than embedded statistics.
An example of semitabular presentation is shown below:
A comparison of the three aerospace-defense companies in the Forbes 500 sample shows that Sundstrand showed the best sales growth between 1988 and 1989. Rockwell International generated the highest net profits for the year 1989.

	Annual Sales Growth	*1989 Net Profits ($ millions)*
Sundstrand	*8.0%*	*$120.8*
Rockwell	*3.3*	*720.7*
Allied-Signal	*0.8*	*528.0*

3. Tabular Presentation

Tables are generally superior to text for presenting statistics, although they should be accompanied by comments directing the reader's attention to important figures. Tables facilitate quantitative comparisons and provide a concise, efficient way to present numerical data.
Tables are either general or summary in nature. General tables tend to be large, complex and detailed. They serve as the repository for the statistical findings of the study and are usually in the appendix of a research report.

Summary tables contain only a few key pieces of data closely related to a specific finding. To make them inviting to the reader (who often skips them), the table designer should omit unimportant details and collapse multiple classifications into composite measures that may be sustained for the original data.

Any table should contain enough information for the reader to understand its contents. The title should explain the subject of the table, how the data are classified, the time period, or other related matters. A subtitle is sometimes included under the title to explain something about the table; most often this is a statement of the measurement units in which data are expressed. The contents of the columns should be clearly identified by the column heads, and the contents of the stub should do the same for the rows. The body of the table contains the data, while the

footnotes contain any needed explanations. Footnotes should be identified by letters or symbols such as asterisks, rather than by numbers, to avoid confusion with data values. Finally, there should be a source note if the data do not come from your original research.

4. Graphics

Compared with tables, graphs show less information and often only approximate values. However, they are more often read and remembered than tables. Their great advantage is that they convey quantitative values and comparisons more readily than talbes. With personal computr charting programs, you can easily turn a set of numbers into a chart or graph.

7.6 Oral Presentations

Researchers often present their findings orally. These presentations, sometimes called briefings, have some unique characteristics that distinguish them from most other kinds of public speaking: Only a small group of people is involved; statistics normally constitute an important portion of the topic; the audience members are usually managers with an interest in the topic, but they want to hear only the critical elements; speaking time will often be as short as 20 minutes but may run longer than an hour; and the presentation is normally followed by questions and discussion.

Preparation

A successful briefing typically requires condensing a lengthy and complex body of information. Since speaking rates should not exceed 100 to 150 words per minute, a 20-minute presentation limits you to about 2,000 to 2,500 words. If you are to communicate effectively under such conditions, you must plan carefully. Begin by asking two questions. First, how long should you plan to talk? Usually there is an indication of the acceptable presentation length. It may be the custom in an organisation to take a given allotted time for a briefing. If the time is severely limited, then the need for topical priorities is obvious. This leads to the second question: What are the purposes of the briefing? Is it to raise concern about problems that have been uncovered? Is it to add to the knowledge of audience members? Is it to give them conclusions and recommendations for their decision making? Questions such as these illustrate the general objectives of the report. After answering these questions, you should develop a detailed outline of what you are going to say. Such an outline should contain the following major parts:

1. *Opening*. A brief statement, probably not more than 10 percent of the allottted time, sets the stage for the body of the report. The opening should be direct, get attention, and introduce the nature of the discussion that follows. It should explain the nature of the project, how it came about, and what it attempted to do.
2. *Findings and Conclusions*. The conclusions may be stated immediately after the opening remarks, with each conclusion followed by the findings that support it.

3. *Recommendations*. Where appropriate, these are stated in the third stage; each recommendation may be followed by references to the conclusions leading to it. Presented in this manner, they provide a natural climax to the report. At the end of the presentation, it may be appropriate to call for questions from the audience.

Early in the planning stage you need to make two further decisions. The first concerns the type of audiovisuals (AV) that will be used and the role they will play in the presentation. AV decisions are important enough that they are often made before the briefing outline and text are developed.

Then you must decide on the type of presentation. Will you give a memorized speech, read from your manuscript, or give an extemporaneous presentation? We rule out the impromptu briefing as an option because impromptu speaking does not involve preparation. Your reputation and the research effort should not be jeopardized by '*winging it*'.

Memorization is a risky and time-consuming course to follow. Any memory slip during the presentation can be a catastrophe, and the delivery sound stilted and distant. Memorization virtually precludes establishing rapport with the audience and adapting to their reactions while you speak. It produces a self or speaker-centered approach and is not recommended.

Reading a manuscript is also not advisable even though many professors seem to reward students who do so (perhaps because they themselves get away with it at professional meetings). The delivery sounds dull and lifeless because most people are not trained to read aloud and therefore do it badly. They become focused on the manuscript to the exclusion of the audience. This head-down preoccupation with the text is clearly inappropriate for management presentations.

The extemporaneous presentation is audience centered and made from minimal notes or an outline. This mode permits the speaker to be natural, conversational, and flexible. Clearly, it is the best choice for an organisational setting. Preparation consists of writing a draft along with a complete sentence outline and converting the main points to notes. In this way, you can try lines of argument, experiment with various ways of expressing thoughts, and develop phraseology. Along the way, the main points are fixed sequentially in your mind, and supporting connections are made.

Audiences accept notes, and their presence does wonders in allaying speaker fears. Even if you never use them, they are there for psychological support. Many prefer to use 5-by-8 inch cards for their briefing notes because they hold more information and so require less shuffling than the smaller 3-by-5 size. Card contents vary widely, but here are some general guidelines for their design:

- Place title and preliminary remarks on the first card.

- Use each of the remaining cards to carry a major section of the presenttion. The amount of detail depends on the need for precision and the speaker's desire for supporting information.
- Include key phrases, illustrations, statistics, dates and pronunciation guides for difficult words. Include also quotations and ideas that bear repeating.
- Along the margin, place instructions and cues, such as SLOW, FAST, EMPHASIZE, TRANSPARENCY A, TURN CHART, and GO BACK TO CHART 3.

Delivery

While the content is the chief concern, the speaker's delivery is also important. A polished presentation adds to the receptiveness of the audience, but there is some danger that the presentation may overpower the message. Fortunately, the typical research audience knows why it is assembled, has a high level of interest, and does not need to be entertained. Even so, the speaker faces a real challenge in communicating effectively. The delivery should be restrained. Demeanor, posture, dress, and total appearance should be appropriate for the occasion. Speed of speech, clarity of enunciation, pauses, and gestures all play their part. Voice pitch, tone quality, and inflections are proper subjects for concern. There is little time for anecdotes and other rapport-developing techniques, yet the speaker must get and hold audience attention.

7.7 Review Questions

1. What information should be included in a research report?

2. Research reports often contain statistical materials of great importance that are presented poorly. Discuss ways to improve statistical presentation.

3. What major problems do you personally have with writing good reports? What can you do about these problems?

References

1. Margaret Peil (1995) social science research methods. East African Educational Publishers.
2. Cooper D.R and Schindler P.S (1993) business research methods 6th Edition. Tata McGraw – Hik New Delhi
3. Walter B. Wentz (1979). Marketing research; Management method and cases. New York Harper and Rorr.

EXAMINATIONS

MT. KENYA UNIVERSITY

END OF SEMESTER EXAMINATION

PAPER I

COURSE CODE: BBM/SBC 323
COURSE TITLE: Business Research Methods
TIME: 2 HOURS

INSTRUCTIONS: ANSWER ALL QUESTIONS IN *SECTION A* AND *ANY OTHER TWO QUESTIONS IN SECTION B*

SECTION A

QUESTION 1: (30 Marks)

a. i. Define the term research.
   ii. How does research differ from business research? (4 marks)

b. You have received a research report done by a consultant for your firm, a life insurance company. The study is a survey of morale in the home office and covers the opinions of about 500 secretaries and clerks plus about 100 executives. You are asked to comment on its quality. What will you look for? (10 marks)

c. Distinguish between
   a) Direct and indirect questions
   b) Open-ended and closed ended questions (4 marks)

d. Explain ***four*** qualities of an effective Literature review in a proposal (8 marks)

e. In a certain industry, a machine fills packets with spice which are supposed to have a mean weight of 40 grams. A random sample of 36 packets is taken and the mean weight is found to be 42.2 grams with a standard deviation of 6 grams. Carry out a test at 5% level of significance. (4 marks)

SECTION B

QUESTION 2 (20 MARKS)

a. An automobile manufacturer observes the demand for its brand increasing as per capita income increases. Sales increases also follow low interest rates, which ease credit conditions. Buyer purchase behaviour is seen to be dependent on age and gender. Other factors influencing sales appear to fluctuate almost randomly (competitor advertising, competitor dealer discounts, introductions of competitive new models).

(i) If sales and per capita income are positively related, classify all variables as dependent, independent, moderating, extraneous, or intervening.
(ii) Comment on the utility of a model based on the hypothesis. (12 Marks)

b. What are the essential differences among nominal, ordinal, interval and ratio scales? (8 Marks)

QUESTION 3 (20 MARKS)

a) Briefly explain any five reasons why business/marketing managers need to know about research. (10 Marks)
b) Using examples from the business world, briefly describe the following research designs:
   (i) Basic research
   (ii) Historical research
   (iii) Applied research. (10 Marks)

QUESTION 4 (20 MARKS)

Junior Academy is a medium cost private school offering both IGSE (Intermediate Certificate of Education) curriculums.The administrations is concerned with low enrolment in the school. Preliminary investigtion attributed the low enrolment to factors: poor exam results, fee increaments, exodus of teachers and corporal punishment being administered on students.

(i) Identify and clearly state the research problem in this situation. (4 Marks)

(ii) List the variables in this context and label them as dependent or independent. (4 marks)

(iii) Write three null hypotheses and three alternative non-directional hypotheses for this study. (6 Marks)

(iv) Briefly describe the main steps that a researcher would follow in conducting a study based on the described situation above. (6 Marks)

QUESTION 5 (20 MARKS)

a. Distinguish between the following methods of sampling: (8 Marks)

(i) Stratified sampling and cluster sampling.

(ii) Systematic sampling and simple random sampling.

(iii) Accidental sampling and snow ball sampling.

(iv) Quota sampling and multi-stage sampling.

b. What are the major steps in the sampling design procedure? (5 Marks)

c. What are the benefits of sampling over census? (7 Marks)

MT. KENYA UNIVERSITY

END OF SEMESTER EXAMINATION

PAPER II

COURSE CODE: BBM/SBC 323
COURSE TITLE: Business Research Methods
TIME: 2 HOURS

INSTRUCTIONS: ANSWER ALL QUESTIONS IN *SECTION A* AND *ANY OTHER TWO QUESTIONS IN SECTION B*

SECTION A

Question 1 (30 Marks)

Selecting a topic of interest, prepare a short proposal (summary) that should contain the following items:

i. A brief statement of the research problem.
ii. Research objectives
iii. Summary of literature to be reviewed
iv. Methodology / research design
v. Preliminary information on the expected findings

SECTION B

QUESTION 2 (20 Marks)

The term "*literature*" refers to the analysis of textbooks or manuscripts. In terms of a literature review, "the literature" means the works the researcher consultedin order to understand and investigate the research problem. A literatute review therefore is an account of what has been published on a topic by the accredited scholars and reseachers. Therfore one can conclude that literature review is an important 'organ' in a reseach proposal. Explain the importance of literature review in Review.

QUESTION 3 (20 Marks)

a. What information should be included in a research report?
b. Many students encounter various challenges in the entire process of writing a comprehensive research report. What major problems do you personally have with writing good reports? What can you do about these problems?

QUESTION 4 (20 Marks)

a. In your company's management development program, there was heated discussion between some people who claimed, 'Theory is impractical and thus no good', and others who claimed, 'Good theory is the most practical approach to problems'. What position would you take and why?
b. Explain the following terms used in business research methods:
    i. Sample
    ii. Population
    iii. Census

QUESTION 5 (20 Marks)

A major corporation agrees to sponsor an internal study on sexual harassment in the workplace. This is in response to concerns expressed by their female employees. How would you handle the following?

a) Sample collection
b) The communication approach (self-administered, telephone, personal interview, mixed)
c) The purpose: fact finding, awareness, relationship building and change.
d) Minimisation of response and nonresponse error.

REFERENCES

1. * A.D. Jankowicz (2005) Business Research Projects 4TH Edition,Luton Business School, UK
2. * Margaret Peil (1995) social science research methods. East African Educational Publishers.
3. Michael J. Barker (1992) research for marketing
4. * Cooper D.R and Schindler P.S (1993) business research methods 6th Edition. Tata McGraw – Hik New Delhi
5. Kerlinger, Fred N. (1936) foundations of behavioral research; 3rd Edition, New York. Holt Rinehartand Winston.
6. * Walter B. Wentz (1979). Marketing research; Management method and cases. New York Harper and Rorr.
7. Seltiz Claire and Cook W.S (1976). Research methods in social relations 3rd Edition New York. Holt, Rinehart and Winston.

*** Core text books**