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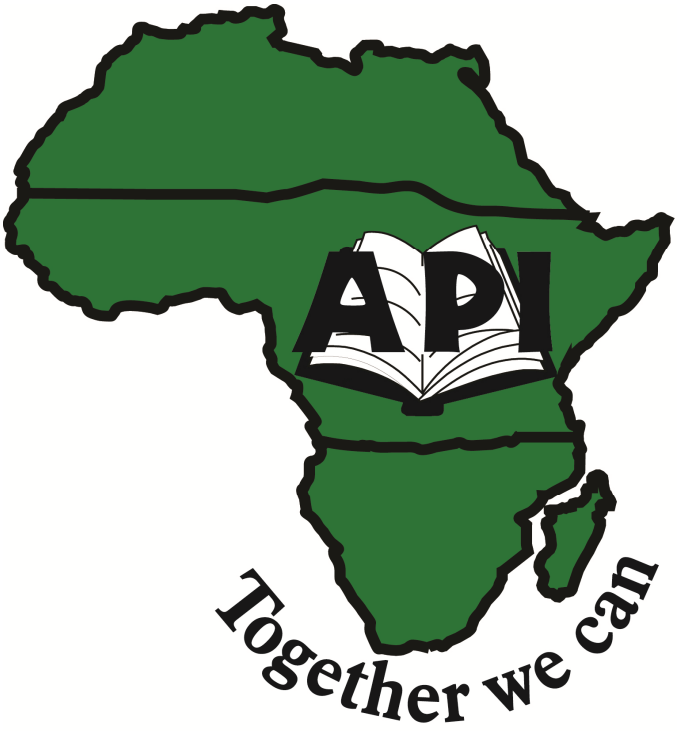

PROJECT PLANNING AND MANAGEMENT
TERM THREE STUDENT'S MODULES (PPM)
Contents

Website: www.africapopulation.net
Email: info@africapopulation.net

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Course Name	: Project Appraisal & Pre-Investment Analysis

Course description

The Course details a comprehensive idea about principles of project planning and management, introduction to management, human resource management, core roles of human resource management, performance management, procurement management, communication skills in project planning & management, the project life cycle, format for project proposal writing, feasibility study & its components, the logical frameworks, Project monitoring and evaluation, cost structure and budgeting and performance management in project management.

Course objectives

- To help students get exposed to different phases of managing related development projects.
- To educate students in identifying and assessing the needs as well as risks involved in project planning and management.
- To enable them develop skills in structuring and scheduling of project costs as well as activities respectively.
- To ensure that students attain a firm body of knowledge in developing competitive project proposals for funding.
- To strengthen their capacity to design approaches to measure performance of workers on several projects.

Course Content

Introduction

- Meaning of Management
- Meaning of Administration
- Functions of Management in project planning
- Major differences between Administration and Management
- Leadership styles used in Project Management
- Motivation theories applicable in Planning and management

Human resource/Personnel Management

- Meaning of Human resource Management(HRM)
- Characteristics of Human Resource Management
- Difference between Human Resource and Personnel Management

Core roles of Human resource Management

- Planning and organizing for work, people and HRM
- People acquisition and development
- Administration of policies, programmes & practices

Performance Management/performance Appraisal

- Definition of Performance Management
- Objectives of performance appraisals
- Types of performance Management
- The appraisal cycle

Procurement Management

- Meaning of Procurement Management
- Basic concepts in procurement
- Definitions of logistics management
- Functions of logistics
- Importance of procurement Management
- Tasks of stakeholders in Procurement
- Role of Procurement specialists
- Principles of Procurement
- Types of procurement
- Categories/methods for procurement

Communication skills in Project Planning & Management

- What can be shared in communication
- Qualities of a good listener
- Barriers to listening
- Objectives of communication
- Levels of communication
- Model of communication process
- Types of communication
- Barriers to effective Communication
- How to overcome communication barriers
- Guidelines for effective communication
- To be a successful communicator

Project Planning/ the project cycle

- What is a project
- Characteristics of a project
- Types of projects and programs
- Project planning & Control Flow Chart
- Steps of a project cycle
- Project Management Process

Format for Project Proposal Writing

- Title
- Executive summary
- Background
- Problems and needs
- Selected project
- Beneficiaries and benefits
- Aim
- Objectives
- Justification
- Outputs
- Activities
- Work plan
- Strategic for project implementation and operations
- Follow up plans

Feasibility study and its Components

- Meaning of feasibility study

- Financial feasibility
- Economic feasibility
- Political feasibility
- Market feasibility
- Social feasibility
- Environmental feasibility
- Gender feasibility

Logical Framework Approach (LFA)

- Basic principles
- Contents of the logical framework
- Advantages of the logical framework
- Limitations of the LFA

Project implementation & Scheduling

- Description of the project implementation
- Requirements for implementation
- Causes of ineffective project implementation

Problem Analysis and Needs Assessment

- Problem tree analysis
- Steps involved in problem analysis
- Classification of needs

Project Monitoring and Evaluation

- Difference between Monitoring and evaluation
- Examples of program elements that can be monitored
- The purpose of evaluation
- Basic questions that evaluation can answer
- Why is M&E important
- Examples of questions that M & E can answer
- When should M & E take place
- Important of the M&E plans
- M&E plan components

Cost Structure and Budgeting

- Characteristics of a good budget
- Objectives of budgeting
- Advantages of budgeting
- Limitations of budgeting
- Essentials of effective budgeting
- Preliminaries in the installation of budget system
- Functions of a budget committee
- Budget terms and concepts
- Budget techniques for operations
- Key factors that make public budgeting process effective

Performance Measurement

- Top management retreat
- Updating the Medium term expenditure framework (MTEF)
- First budget consultative budget framework workshop
- Sector working group discussions
- Local government budget frame work process

- Consultations and finalization of the budget frame work paper etc

Mode of delivery Face to face lectures
Assessment
Coursework 40%
Exams 60%
Total Mark 100%

Introduction

Project appraisal is a generic term that refers to the process of assessing, in a structured way, the case for proceeding with a project or proposal. In short, project appraisal is the effort of calculating a project's viability. It often involves comparing various options, using economic appraisal or some other decision analysis technique

Process

- Initial Assessment
- Define problem and long-list
- Consult and short-list
- Develop options
- Compare and select Project

Types of appraisal

- Technical appraisal
- Commercial and marketing appraisal
- Financial/economic appraisal
- organisational or management appraisal
    - Cost-benefit analysis
- Economic appraisal
    - Cost-effectiveness analysis
    - Scoring and weighting

Economic appraisal

Economic appraisal is a type of decision method applied to a project, programme or policy that takes into account a wide range of costs and benefits, denominated in monetary terms or for which a monetary equivalent can be estimated. Economic Appraisal is a key tool for achieving value for money and satisfying requirements for decision accountability. It is a systematic process for examining alternative uses of resources, focusing on assessment of needs, objectives, options, costs, benefits, risks, funding, affordability and other factors relevant to decisions.

The main types of economic appraisal are:

- Cost-benefit analysis

- Cost-effectiveness analysis
- Scoring and weighting

Economic appraisal is a methodology designed to assist in defining problems and finding solutions that offer the best value for money (VFM). This is especially important in relation to public expenditure and is often used as a vehicle for planning and approval of public investment relating to policies, programmes and projects.

The principles of appraisal are applicable to all decisions, even those concerned with small expenditures. However, the scope of appraisal can also be very wide. Good economic appraisal leads to better decisions and VFM. It facilitates good project management and project evaluation. Appraisal is an essential part of good financial management, and it is vital to decision-making and accountability.

Cost–benefit analysis

Cost–benefit analysis (CBA), sometimes called **benefit–cost analysis** (BCA), is a systematic process for calculating and comparing benefits and costs of a project, decision or government policy (hereafter, "project"). CBA has two purposes:

1. To determine if it is a sound investment/decision (justification/feasibility),
2. To provide a basis for comparing projects. It involves comparing the total expected cost of each option against the total expected benefits, to see whether the benefits outweigh the costs, and by how much.[1]

CBA is related to, but distinct from cost-effectiveness analysis. In CBA, benefits and costs are expressed in money terms, and are adjusted for the time value of money, so that all flows of benefits and flows of project costs over time (which tend to occur at different points in time) are expressed on a common basis in terms of their "net present value."

Closely related, but slightly different, formal techniques include cost-effectiveness analysis, cost–utility analysis, economic impact analysis, fiscal impact analysis and Social return on investment (SROI) analysis.

Theory

Cost–benefit analysis is often used by governments and other organizations, such as private sector businesses, to evaluate the desirability of a given policy. It is an analysis of the expected balance of benefits and costs, including an account of foregone alternatives and the *status quo*. CBA helps predict whether the benefits of a policy outweigh its costs, and by how much relative to other alternatives (i.e. one can rank alternate policies in terms of the cost-benefit ratio).[2] Generally, accurate cost-benefit analysis identifies choices that increase welfare from a utilitarian perspective. Assuming an accurate CBA, changing the status quo by implementing the alternative with the lowest cost-benefit ratio can improve pareto efficiency.[3]. An analyst using CBA should recognize that perfect evaluation of all present and future

costs and benefits is difficult, and while CBA can offer a well-educated estimate of the best alternative, perfection in terms of economic efficiency and social welfare are not guaranteed.[4]

Process

The following is a list of steps that comprise a generic cost-benefit analysis.[5]

1. List alternative projects/programs.
2. List stakeholders.
3. Select measurement(s) and measure all cost/benefit elements.
4. Predict outcome of cost and benefits over relevant time period.
5. Convert all costs and benefits into a common currency.
6. Apply discount rate.
7. Calculate net present value of project options.
8. Perform sensitivity analysis.
9. Adopt recommended choice.

Valuation

CBA attempts to measure the positive or negative consequences of a project, which may include:

1. Effects on users or participants
2. Effects on non-users or non-participants
3. Externality effects
4. Option value or other social benefits

A similar breakdown is employed in environmental analysis of total economic value. Both costs and benefits can be diverse. Financial costs tend to be most thoroughly represented in cost-benefit analyses due to relatively abundant market data. The net benefits of a project may incorporate cost savings or public willingness to pay compensation (implying the public has no legal right to the benefits of the policy) or willingness to accept compensation (implying the public has a right to the benefits of the policy) for the welfare change resulting from the policy. The guiding principle of evaluating benefits is to list all (categories of) parties affected by an intervention and add the (positive or negative) value, usually monetary, that they ascribe to its effect on their welfare.

The actual compensation an individual would require to have their welfare unchanged by a policy is inexact at best. Surveys (stated preference techniques) or market behavior (revealed preference techniques) are often used to estimate the compensation associated with a policy, however survey respondents often have strong incentives to misreport their true preferences and market behavior does not provide any information about important non-market welfare impacts.

One controversy is valuing a human life, e.g. when assessing road safety measures or life-saving medicines. However, this can sometimes be avoided by using the

related technique of cost-utility analysis, in which benefits are expressed in non-monetary units such as quality-adjusted life years. For example, road safety can be measured in terms of *cost per life saved*, without formally placing a financial value on the life. However, such non-monetary metrics have limited usefulness for evaluating policies with substantially different outcomes. Additionally, many other benefits may accrue from the policy, and metrics such as 'cost per life saved' may lead to a substantially different ranking of alternatives than traditional cost-benefit analysis.

Another controversy is valuing the environment, which in the 21st century is typically assessed by valuing ecosystem services to humans, such as air and water quality and pollution. Monetary values may also be assigned to other intangible effects such as business reputation, market penetration, or long-term enterprise strategy alignment.

Time and Discounting

CBA usually tries to put all relevant costs and benefits on a common temporal footing using time value of money calculations. This is often done by converting the future expected streams of costs and benefits into a present value amount using a discount rate. Empirical studies and a technical framework[6] suggest that in reality, people do discount the future like this.

The choice of discount rate is subjective. A smaller rate values future generations equally with the current generation. Larger rates (e.g. a market rate of return) reflects humans' attraction to time inconsistency—valuing money that they receive today more than money they get in the future. The choice makes a large difference in assessing interventions with long-term effects, such as those affecting climate change. One issue is the equity premium puzzle, in which long-term returns on equities may be rather higher than they should be. If so then arguably market rates of return should not be used to determine a discount rate, as doing so would have the effect of undervaluing the distant future (e.g. climate change).[7]

Risk and uncertainty

Risk associated with project outcomes is usually handled using probability theory. This can be factored into the discount rate (to have uncertainty increasing over time), but is usually considered separately. Particular consideration is often given to risk aversion—the irrational preference for avoiding loss over achieving gain. Expected return calculations does not account for the detrimental effect of uncertainty.[*citation needed*]

Uncertainty in CBA parameters (as opposed to risk of project failure etc.) can be evaluated using a sensitivity analysis, which shows how results respond to parameter changes. Alternatively a more formal risk analysis can be undertaken using Monte Carlo simulations.[8]

History

The concept of CBA dates back to an 1848 article by Jules Dupuit and was formalized in subsequent works by Alfred Marshall. The Corps of Engineers initiated the use of CBA in the US, after the Federal Navigation Act of 1936 effectively required cost–benefit analysis for proposed federal waterway infrastructure.[9] The Flood Control Act of 1939 was instrumental in establishing CBA as federal policy. It demanded that "the benefits to whomever they accrue [be] in excess of the estimated costs.[10]

Public Policy

The application for broader public policy started from the work of Otto Eckstein[11], who in 1958 laid out a welfare economics foundation for CBA and its application for water resource development. Over the 1960's, CBA was applied in the US for water quality[12], recreation travel[13] and land conservation.[14] During this period, the concept of option value was developed to represent the non-tangible value of preserving resources such as national parks.

CBA was later expanded to address both intangible and tangible benefits of public policies relating to mental illness,[16] substance abuse,[17] college education[18] and chemical waste policies.[19] In the US, the National Environmental Policy Act of 1969 first required the application of CBA for regulatory programs, and since then, other governments have enacted similar rules. Government guidebooks for the application of CBA to public policies include the Canadian guide for regulatory analysis,[20] Australian guide for regulation and finance,[21] US guide for health care programs,[22] and US guide for emergency management programs.[23]

Transportation Investment

CBA application for transport investment started in the UK, with the M1 motorway project in 1960. It was later applied on many projects including London Underground's Victoria Line. Later, the New Approach to Appraisal (NATA) was introduced by the then Department for Transport, Environment and the Regions. This presented cost–benefit results and detailed environmental impact assessments in a balanced way. NATA was first applied to national road schemes in the 1998 Roads Review but subsequently rolled out to all transport modes. As of 2011 it was a cornerstone of transport appraisal in the UK and is maintained and developed by the Department for Transport.

The EU's 'Developing Harmonised European Approaches for Transport Costing and Project Assessment' (HEATCO) project, part of its Sixth Framework Programme, reviewed transport appraisal guidance across EU member states and found that significant differences exist between countries. HEATCO's aim was to develop guidelines to harmonise transport appraisal practice across the EU.

Transport Canada promoted the use of CBA for major transport investments with the 1994 issuance of its Guidebook.

In the US, both federal and state transport departments commonly apply CBA, using a variety of available software tools including HERS, BCA.Net, StatBenCost, Cal-BC, and TREDIS. Guides are available from the Federal Highway Administration, Federal Aviation Administration, Minnesota Department of Transportation,[31] California Department of Transportation (Caltrans), and the Transportation Research Board Transportation Economics Committee.

Accuracy

The value of a cost–benefit analysis depends on the accuracy of the individual cost and benefit estimates. Comparative studies indicate that such estimates are often flawed, preventing improvements in Pareto and Kaldor-Hicks efficiency. Causes of these inaccuracies include:

1. Overreliance on data from past projects (often differing markedly in function or size and the skill levels of the team members)
2. Use of subjective impressions by assessment team members
3. Inappropriate use of heuristics to derive money cost of the intangible elements
4. Confirmation bias among project supporters (looking for reasons to proceed)

Reference class forecasting was developed by professor Bent Flyvbjerg, University of Oxford, to increase accuracy in estimates of costs and benefits.[34] Daniel Kahneman, Nobel Prize winner in economics, calls Flyvbjerg's counsel to use reference class forecasting to de-bias forecasts, "the single most important piece of advice regarding how to increase accuracy in forecasting."

Interest groups may attempt to include or exclude significant costs from an analysis to influence the outcome.

In the case of the Ford Pinto (where, because of design flaws, the Pinto was liable to burst into flames in a rear-impact collision), the company's decision was not to issue a recall. Ford's cost–benefit analysis had estimated that based on the number of cars in use and the probable accident rate, deaths due to the design flaw would cost it about $49.5 million to settle wrongful death lawsuits versus recall costs of $137.5 million. Ford overlooked (or considered insignificant) the costs of the negative publicity that would result, which forced a recall *and* damaged sales.[36]

In health economics, some analysts think cost–benefit analysis can be an inadequate measure because willingness-to-pay methods of determining the value of human life can be influenced by income level. They support use of variants such as cost–utility analysis and quality-adjusted life year to analyze the effects of health policies.

In environmental and occupational health regulation, it has been argued that if modern cost-benefit analyses had been applied prospectively to decisions such as removing lead from gasoline, building Hoover Dam in the Grand Canyon and regulating workers' exposure to vinyl chloride, they would not have been implemented even though they are considered to be highly successful in retrospect. The Clean Air Act has been cited in retrospective studies as a case where benefits

exceeded costs, but the knowledge of the benefits (attributable largely to the benefits of reducing particulate pollution) was not available until many years later.

Cost-effectiveness analysis

Cost-effectiveness analysis (**CEA**) is a form of economic analysis that compares the relative costs and outcomes (effects) of two or more courses of action. Cost-effectiveness analysis is distinct from cost-benefit analysis, which assigns a monetary value to the measure of effect.[1] Cost-effectiveness analysis is often used in the field of health services, where it may be inappropriate to monetize health effect. Typically the CEA is expressed in terms of a ratio where the denominator is a gain in health from a measure (years of life, premature births averted, sight-years gained) and the numerator is the cost associated with the health gain.[2] The most commonly used outcome measure is quality-adjusted life years (QALY).[1] Cost-utility analysis is similar to cost-effectiveness analysis. Cost-effectiveness analyses are often visualized on a cost-effectiveness plane consisting of four-quadrants. Outcomes plotted in Quadrant I are more effective and more expensive, those in Quadrant II are more effective and less expensive, those in Quadrant III are less effective and less expensive, and those in Quadrant IV are less effective and more expensive. [3]

General application

The concept of cost effectiveness is applied to the planning and management of many types of organized activity.It is widely used in many aspects of life. In the acquisition of military tanks, for example, competing designs are compared not only for purchase price, but also for such factors as their operating radius, top speed, rate of fire, armor protection, and caliber and armor penetration of their guns. If a tank's performance in these areas is equal or even slightly inferior to its competitor, but substantially less expensive and easier to produce, military planners may select it as more cost effective than the competitor. Conversely, if the difference in price is near zero, but the more costly competitor would convey an enormous battlefield advantage through special ammunition, radar fire control and laser range finding, enabling it to destroy enemy tanks accurately at extreme ranges, military planners may choose it instead—based on the same cost effectiveness principle.

Cost effectiveness analysis is also applied to many other areas of human activity, including the economics of automobile usage.

CEA in pharmacoeconomics

In the context of pharmacoeconomics, the cost-effectiveness of a therapeutic or preventive intervention is the ratio of the cost of the intervention to a relevant measure of its effect. Cost refers to the resource expended for the intervention, usually measured in monetary terms such as dollars or pounds. The measure of effects depends on the intervention being considered. Examples include the number of people cured of a disease, the mm Hg reduction in diastolic blood pressure and the number of symptom-free days experienced by a patient. The selection of the appropriate effect measure should be based on clinical judgement in the context of the intervention being considered.

A special case of CEA is cost-utility analysis, where the effects are measured in terms of years of full health lived, using a measure such as quality-adjusted life years or disability-adjusted life years. Cost-effectiveness is typically expressed as an incremental cost-effectiveness ratio (ICER), the ratio of change in costs to the change in effects. A complete compilation of cost-utility analyses in the peer reviewed medical literature is available from the Cost-Effectiveness Analysis Registry website.

A 1995 study of the cost-effectiveness of over 500 life-saving medical interventions found that the median cost per intervention was $42,000 per life-year saved.[4] A 2006 systematic review found that industry-funded studies often concluded with cost effective ratios below $20,000 per QALY and low quality studies and those conducted outside the US and EU were less likely to be below this threshold. While the two conclusions of this article may indicate that industry-funded ICER measures are lower methodological quality than those published by non-industry sources, there is also a possibility that, due to the nature of retrospective or other non-public work, publication bias may exist rather than methodology biases. There may be incentive for an organization not to develop or publish an analysis that does not demonstrate the value of their product. Additionally, peer reviewed journal articles should have a strong and defendable methodology, as that is the expectation of the peer-review process.

The Weighting and Scoring Method

Introduction

There are a number of approaches to the appraisal of costs and benefits that are difficult to value in money terms. These include, for example, listing and describing them, developing a matrix or impact statement, and applying the weighted scoring method. As indicated in section 2.7 above, these various approaches should be considered carefully before choosing the method most suited to the case in hand. Listing and describing is often adequate in simple cases. The impact statement approach is adaptable to most circumstances. The weighted scoring method, explained here, is a possible alternative approach.

Before explaining the weighted scoring method, some words of warning are appropriate.

- Firstly, DFP is generally content with the appropriate use of either the 'list and describe' or impact statement approaches, and does not require the use of the weighted scoring method.
- Secondly, where the weighted scoring method is employed, DFP expects the rationale for each weight and each score to be fully explained. Failure to do this can cause delays in the approval process.

What is the Weighted Scoring Method?

The weighted scoring method, also known as 'weighting and scoring', is a form of multi-attribute or multi-criterion analysis. It involves identification of all the non-monetary factors (or "attributes") that are relevant to the project; the allocation of

weights to each of them to reflect their relative importance; and the allocation of scores to each option to reflect how it performs in relation to each attribute. The result is a single weighted score for each option, which may be used to indicate and compare the overall performance of the options in non-monetary terms.

This process necessarily assigns numeric values to judgements. These judgements should not be arbitrary or subjective, but should reflect expert views, and should be supported by objective information. To achieve meaningful results which decision-makers can rely on, it is important that:

1. the exercise is not left to the 'experts', but is undertaken by a group of people who represent all of the interested parties, including, for example, those who are directly affected by the project, and those who are responsible for its delivery;
2. the group possesses the relevant knowledge and expertise required to make credible measurements and judgments of how the options will impact upon the attributes;
3. the group is led by an independent chairman to steer the process, probe opinions, promote consensus and avoid prejudice; and
4. the justification for the group's chosen weights and scores is fully explained.

Appraisal reports should identify the personnel involved in the exercise, including an indication of their credentials, so that decision-makers are fully aware of whose views are represented. If there is a lack of consensus among members of the group regarding any of the weights or scores, the views of the dissenting individuals should be recorded.

The process of deriving weights and scores is explained below step by step, covering the following stages:

1. Identify the relevant non-monetary attributes;
2. Weight the attributes to reflect their relative importance;
3. Score the options to reflect how each option performs against each attribute;
4. Calculate the weighted scores;
5. Test the results for robustness; and
6. Interpret the results.

Step 1: Identification of Non-Monetary Attributes

Identifying the attributes may sound straightforward, but attributes must be clearly defined so that both appraisers and those reviewing appraisal reports have a clear understanding of them. To help in the scoring of options, attributes should be defined as far as possible in service or output-oriented terms, and they should generally relate closely to the service objectives and performance criteria established at the outset of the overall appraisal. Considerable care is also needed to ensure that:

1. there is no double counting caused by an overlap in the attributes (e.g. aesthetic qualities and attractiveness);
2. there is no double counting caused by attributes being covered by costs (e.g.

including a 'reliability' attribute when reliability is already provided for by inclusion of maintenance costs); and
3. all relevant attributes are included, even if they are common to all the options.

Regarding point 3. above, it is important to include relevant attributes even when all the options appear to impact equally upon them. Omission of common attributes can distort scores and lead to an imbalanced comparison of the differences between the options. For example, Options X and Y may score 200 and 100 respectively, when common attributes are overlooked, giving the impression that X is twice as beneficial as Y. However, if common attributes are worth 300, the correct scores for X and Y should be 500 and 400 respectively, indicating that X has a significantly smaller advantage over Y when all the non-monetary factors are taken into account. Apart from distortion of scores, there is a general risk that the appraisal may focus on attributes that are relatively insignificant while overlooking the most important attributes.

Attributes are best defined so that the status quo or do minimum baseline option can be given a score other than zero. For example, if one of the project objectives is to improve access for the disabled, the attribute is better defined as 'accessibility for the disabled' rather than 'improvement in accessibility for the disabled'.

- The first definition allows all of the options, including the baseline option, to be scored, and thus enables the options to be compared in proportion to the baseline.
- The second definition necessitates a zero score for the baseline option, which means that the scores for the alternatives can not indicate how much better they perform than the baseline option.

(This is not to say that the baseline option should never be given a zero score. In the accessibility example, the baseline option will deserve a score of 0 if the current provision is completely inaccessible to the disabled. However, the more likely position is that the disabled can access it with a degree of difficulty, in which case a suitably positive score would be appropriate).

Example: In a certain health service appraisal, the relevant attributes are identified as:

- *number of cases treated;*
- *waiting time;*
- *patient access; and*
- *disruption to services.*

Step 2: Decide the Weights for Each Attribute

The second stage is to decide on the weights to be attached to each of the attributes identified. This should reflect the group consensus about the relative importance of the attributes, which is a matter for judgement based on, for instance, relevant policy statements. The most common approach, and the one which is most readily comprehended, is to express the weights in percentage terms so that they sum to 100.

Justification for the weights ascribed should be recorded. Such an explicit approach helps to ensure that the basis of the weights is fully understood and accepted by all those participating in the exercise as well as those using its results.

Example: The group appraising our hypothetical health services project has decided that the following weights are appropriate:

- number of cases treated - 40%
- waiting time - 30%
- patient access - 20%
- disruption to services - 10%

Step 3: Scoring the Options

The third stage is to score each option against each attribute on a suitable scale. The approach described here uses a *cardinal* scale. This means that if Option A is considered to perform three times as well as Option B, then Option A is given a score that is three times that of Option B. Simpler alternatives to cardinality are possible, for example an *ordinal* scale may be used. This provides a simple ranking of options against each attribute, which enables one to say that Option A is better than Option B, but it does not indicate *how much* better A is than B. Such an approach may be useful in some circumstances, but a cardinal approach, if sustainable, is more informative.

Options are scored against the attributes by reference to a scale, say from 0 to +20. A score of 0 will indicate that the option offers no benefits at all in terms of the relevant attribute, while a score of +20 will indicate that it represents some "maximum" or "ideal" level of performance. Scores between 0 and +20 will indicate intermediate levels of performance. The scale used does not have to be from 0 to +20, but mathematical consistency demands that the same scale is used for all attributes. The meaning of the maximum and minimum score should always be clearly defined and the whole scoring system should be documented clearly in the appraisal report. Group members should have a common understanding of it.

To achieve cardinality, the group needs to think carefully about the differences in the scores awarded to the options, and to provide meaningful justification for them. Suppose, for example, that the attribute 'waiting time' refers to the speed of delivery of a particular service, and that options are scored on a scale from 0 to +20. The group has decided that a score of 0 represents a waiting time that is completely unacceptable e.g. 12 months or more; while a score of 20 represents a waiting time at or close to zero. If Option C delivers in 3 months, while Option D delivers in 6 months, then, using the scale as defined, it would be reasonable to award Options C and D scores of 15 and 10 respectively. In another example, where the attribute is 'accessibility' it may be possible to justify different scores on the basis of objective information about differences in distances travelled.

The weighted scoring method should not be used to avoid the effort of measuring differences between options in measurable non-monetary units. Nor should it be used to substitute vague subjective judgments of comparative performance for hard measurement. The credibility of the scores depends upon the provision of a rational justification to support them, including measurement where possible. In any case,

project sponsors must be able to provide justification for each and every score that is awarded, and DFP will expect this to be recorded in full detail.

Scores should be allocated to all of the options, including the baseline option (i.e. the status quo or 'do minimum'). A common error has been to overlook the baseline, but it is important to include it. However inadequate it may seem, the existing or 'do minimum' level of service will normally impact on the attributes to some extent, and scoring this helps to give a sense of proportion to the scores of the other options, and to compare their performance to that of the current or minimum level of provision.

Example: The health service group scores four options against the attributes as follows:

	Option P (Status Quo)	Option Q	Option R	Option S
No. of cases treated	5	10	12	15
Waiting Time	8	12	14	16
Patient access	10	10	15	15
Disruption to services	10	5	5	10

Step 4: Calculate the Weighted Scores

15.17 This simply involves multiplying each score by the weight for the relevant attribute. Thus weighted, the scores are totalled to obtain an aggregate weighted score for each option.

Example: Combining the last two examples results in the following weighted scores:

	Option P (Status Quo)	Option Q	Option R	Option S
No. of cases treated	5x40 = 200	10x40 = 400	12x40 = 480	15x40 = 600
Waiting Time	8x30 = 240	12x30 = 360	14x30 = 420	16x30 = 480
Patient access	10x20 = 200	10x20 = 200	15x20 = 300	15x20 = 300
Disruption to services	15x10 = 150	5x10 = 50	5x10 = 50	10x10 = 100
Total Weighted Score:	790	1,010	1,250	1,480

Step 5: Test the Robustness of the Results

It is important to examine how robust the results are to changes in the weights and scores used. This can be done with the aid of sensitivity analysis. For example, the weighted scores can be recalculated to demonstrate the effect upon them of changing

the weights. Similarly, they can be recalculated to show the impact of different scores.

Judgement should be used to select suitable variations in assumptions to subject to sensitivity analysis. For example, where there have been differences in opinion within the group about certain weights or scores, it will be helpful to explore the impact of using the different weights or scores advocated by different group members.

Details of the sensitivity analysis should be recorded, and the robustness of the results confirmed. Where appropriate, attention should be drawn to circumstances in which the ranking of options, or the differences in weighted scores, are particularly sensitive to plausible changes in certain weights or scores.

Step 6: Interpret the Results

Non-monetary factors are generally important in public sector appraisals therefore weighted scores can have a crucial influence upon option selection. It is vital that they are compiled and interpreted carefully, and that the reasoning behind the figures is clearly presented in appraisal reports.

The results will consist of a set of weighted scores, including one for each option. These should act as indices for comparing the options' overall performance on non-monetary factors, indicating not only how the options rank but also how great are the differences between them. Thus they should serve a similar purpose in respect to non-monetary factors as NPVs do in respect to monetary factors. For example, if Options E, F and G have weighted scores of 2000, 1000, and 950 respectively, this indicates that Option E is significantly better (about twice as good) as either Options F or G, while Option F is slightly better than Option G. This is more informative than the use of an ordinal scale, which can only indicate the rank order of E, F and G.

Weighted scores can be directly compared with NPVs, to help assess trade-offs between costs and non-monetary performance. This is illustrated by the following example.

1. Option	**2. Net Present Cost**	**3. Weighted Score**	**4. Total Cost per Unit of Weighted Score**	**5. Marginal Increase in Weighted Score** *compared to Option P*	**6. Marginal Cost per Extra Unit of Weighted Score** *compared to Option P*
	(£M)		(£)		(£)
P	3.0	790	3,797		
Q	4.5	1,010			
R	4.0	1,250	3,200	460	2,174
S	5.0	1,480	3,378	690	2,899

Columns 2 & 3 show the Net Present Costs (NPCs) and Weighted Scores of Options P, Q, R and S. The information in these columns is sufficient to indicate that Option R dominates Option Q. In other words, Option Q is both more costly and less

beneficial than Option R, and, other things being equal, can be dismissed from further consideration.

The figures in columns 4 to 6 help to compare the cost-effectiveness of Options P, R and S. Column 4 implies that Option R is the most cost-effective in terms of total cost per unit of weighted score. Columns 5 & 6 help to indicate the differences between Options R and S and the least cost option, Option P. The figures suggest that Options R and S offers significant extra benefits than P, and that Option R does so at the lowest marginal cost.

Such calculations need to be handled with care. It is important to bear in mind that weights and scores are based on judgements. They are not precise measurements against an interval scale, such as the measurement of temperature against the Fahrenheit or centigrade scales. The importance of explaining the weights and scores fully, and interpreting the results carefully, can not be over-stressed.

The results of a weighted scoring exercise are specific to individual cases, and are not readily transferable to others. However, the attributes relevant to one project are likely to be relevant to other projects of a similar type. The weights given to these attributes may not be the same, but the principles for deciding the weights should show some consistency across similar projects. There should also be some consistency in the principles used for scoring options within similar categories of project.

Decision analysis

Decision analysis (**DA**) is the discipline comprising the philosophy, theory, methodology, and professional practice necessary to address important decisions in a formal manner. Decision analysis includes many procedures, methods, and tools for identifying, clearly representing, and formally assessing important aspects of a decision, for prescribing a recommended course of action by applying the maximum expected utility action axiom to a well-formed representation of the decision, and for translating the formal representation of a decision and its corresponding recommendation into insight for the decision maker and other stakeholders.

History and methodology

The term *decision analysis* was coined in 1964 by Ronald A. Howard,[1] who since then, as a professor at Stanford University, has been instrumental in developing much of the practice and professional application of DA.

Graphical representation of decision analysis problems commonly use influence diagrams and decision trees. Both of these tools represent the alternatives available to the decision maker, the uncertainty they face, and evaluation measures representing how well they achieve their objectives in the final outcome. Uncertainties are represented through probabilities and probability distributions. The decision maker's attitude to risk is represented by utility functions and their attitude to trade-offs between conflicting objectives can be made using multi-attribute value functions or multi-attribute utility functions (if there is risk involved). In some cases, utility functions can be replaced by the probability of achieving uncertain aspiration levels. Decision analysis advocates choosing that decision

whose consequences have the maximum expected utility (or which maximize the probability of achieving the uncertain aspiration level). Such decision analytic methods are used in a wide variety of fields, including business (planning, marketing, and negotiation), environmental remediation, health care research and management, energy exploration, litigation and dispute resolution, etc.

Decision analysis is used by major corporations to make multi-billion dollar capital investments. In 2010, Chevron won the Decision Analysis Society Practice Award for its use of decision analysis in all major decisions. In a video detailing Chevron's use of decision analysis, Chevron Vice Chairman George Kirkland notes that "decision analysis is a part of how Chevron does business for a simple, but powerful, reason: it works."

Controversy

Decision researchers studying how individuals research decisions have found that decision analysis is rarely used.[2] High-stakes decisions, made under time pressure, are not well described by decision analysis.[3] Some decision analysts, in turn,[4] argue that their approach is prescriptive, providing a prescription of what actions to take based on sound logic, rather than a descriptive approach, describing the flaws in the way people do make decisions. Critics cite the phenomenon of paralysis by analysis as one possible consequence of over-reliance on decision analysis in organizations.

Studies have demonstrated the utility of decision analysis in creating decision-making algorithms that are superior to "unaided intuition".[5][6]

The term "decision analytic" has often been reserved for decisions that do not appear to lend themselves to mathematical optimization methods. Methods like applied information economics, however, attempt to apply more rigorous quantitative methods even to these types of decisions.

Pre investment analysis

The purpose of the services - confirmation of the declared data on the commercial activities of the company (not the company's valuation, but only a confirmation or refutation of the declared data)

Areas of analysis:

- overall investment strategy fit;
- managerial team quality & expertise;
- product & market analysis;
- associated macroeconomic & industry specific risks;
- product & process technology;
- competitive advantages/disadvantages;
- projections & cash flow;
- level of professionalism of the management team;
- presence or absence of a unique business concept, a clear understanding of the company's development strategy, a detailed business plan;

- the presence or absence of competitive advantage, ie, the potential for market leadership;
- degree of financial transparency, compliance with corporate governance principles or the company's commitment to transparency;
- presence or absence of potential high yields on invested capital.

Among our clients were: pharmaceutical companies, investing funds, investment banks, pharmaceutical distributors, wholesalers and pharmacy chains.

- Commercial Audit
- Marketing Audit
- Exporting Audit
- HR Audit
- Strategy Evaluation
- Management
- Financials

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Course Name: PROJECT MONITORING & EVALUATION

Monitoring and Evaluation (M&E) is an essential component of any intervention, project, or program. This course will help you understand what M&E is, why it is important, and the basics of what it entails. Monitoring and evaluation program helps to monitor and reflect progress against plan, Provide field back, Identify needed changes and Improve work processes and objectives

Specific Objectives:

i. At the end of this course, you will be able to:
ii. Identify the basic purposes and scope of M&E
iii. Differentiate between monitoring functions and evaluation functions
iv. Describe the functions of an M&E plan
v. Identify the main components of an M&E plan
vi. Identify and differentiate between conceptual frameworks, results frameworks, and logic models
vii. Describe how frameworks are used for M&E planning
viii. Identify criteria for the selection of indicators
ix. Describe how indicators are linked to frameworks
x. Identify types of data sources
xi. Describe how information can be used for decision-making

What Is Monitoring and Evaluation?

When you read that the prevalence of low birth weight in a country is 20%, have you ever wondered how this calculation was derived? Or when you hear that the percentage of married women of reproductive age in a rural area using a modern contraceptive method rose from 52% to 73%, do you wonder how they know this? These types of statistics and other similar information result from “monitoring and evaluation” or “M&E” efforts. M&E is the process by which data are collected and analyzed in order to provide information to policy makers and others for use in program planning and project management. The terms monitoring and evaluation are often used interchangeably, but there are important differences between them.

Monitoring generally refers to the process of regularly checking on the status of the program by comparing the actual implementation of activities against a work plan, including whether the activities are being completed as planned, whether they are being conducted with in the time frame specified, whether the budget is being spent according to plan, whether any changes are needed in the management or implementation of the activities, and whether the work plan should be modified.

Evaluation on the other hand is directed at measuring progress toward the achievement of program objectives and the impact of the program (whether the intended long term changes have occurred).This includes measuring the extent to which the changes that have occurred are attributable to your programs activities. Although there are differences between monitoring and evaluation, the two processes

work together to lead to the same end, which is to produce information that can be used to improve the management of a program and achieve the intended short term objectives and long-term results.

Check to see if you now know whether the following situations call for "monitoring" or "evaluation." The National Council of Population and Development wants to know if the programs being carried out in province A are reducing unintended pregnancy among adolescents in that province. USAID wants to know how many sex workers have been reached by your program this year. A country director is interested in finding out if the post abortion care provided in public clinics meets national standards of quality.

Solution:
The National Council of Population and Development wants to know if the programs being carried out in province A are reducing unintended pregnancy among adolescents in that province. This is evaluation because it is concerned with the impact of particular programs. USAID wants to know how many sex workers have been reached by your program this year. This is monitoring because it is concerned with counting the number of something (sex workers reached). A country director is interested in finding out if the post abortion care provided in public clinics meets national standards of quality. This is monitoring because it requires tracking something (quality of care).

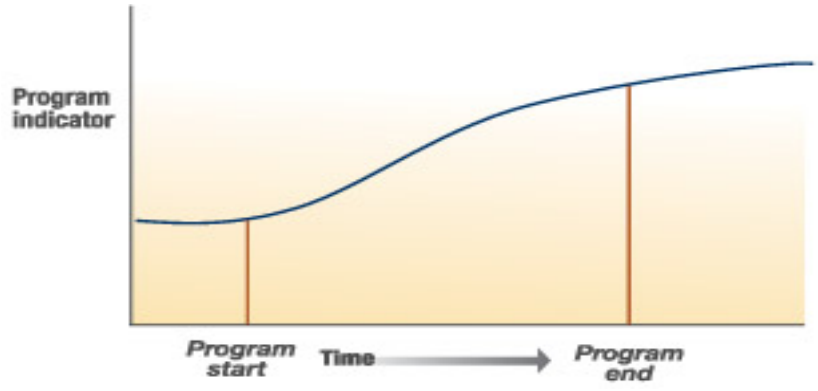
What Is Monitoring?

Monitoring of a program or intervention involves the collection of routine data that measure progress toward achieving program objectives. It is used to track changes in program performance over time. Its purpose is to permit stakeholders to make informed decisions regarding the effectiveness of programs and the efficient use of resources. Monitoring is sometimes referred to as process evaluation because it focuses on the implementation process and asks key questions:

- How well has the program been implemented?
- How much does implementation vary from site to site?
- Did the program benefit the intended people? At what cost?

Examples of program elements that can be monitored:

- Supply inventories
- Number of vaccine doses administered monthly
- Quality of service
- Service coverage
- Patient outcomes (changes in behavior, morbidity, etc)



A graphic illustration of program monitoring over time could look like this. The program indicator being measured on the "Y" axis could be any element of the program that needs tracking, such as the cost of supplies, the number of times the staff provide certain information to clients, or the percentage of clients who are pleased with the services they received.

Monitoring is an ongoing, continuous process that; requires the collection of data at multiple points throughout the program cycle, including at the beginning to provide a baseline; can be used to determine if activities need adjustment during the intervention to improve desired outcomes.

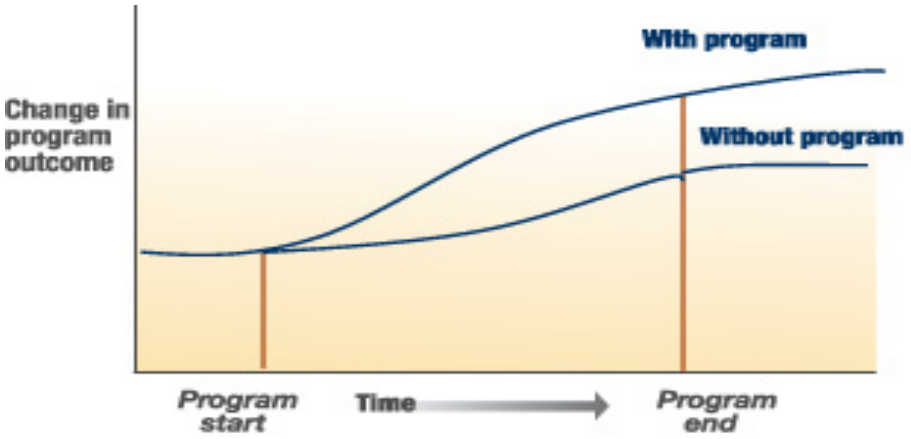
Monitoring usually pertains to counting, tracking, and collecting, for example:

- Counting clients seen or health workers trained
- Tracking condoms distributed
- Collecting data on clinic clients

What Is Evaluation?

Evaluation is the systematic application of both quantitative and qualitative research techniques to determine the appropriateness and effectiveness of the design and implementation of social programs. Often in implementing programs we become so caught up in the day today challenges that we neglect asking a key question, is our program making a difference? More specifically is it achieving the stated objectives? Evaluation offers the answer to this question.

Evaluation measures how well the program activities have met expected objectives and/or the extent to which changes in outcomes can be attributed to the program or intervention. The difference in the outcome of interest between having or not having the program or intervention is known as its "impact" and is commonly referred to as "impact evaluation." Evaluation is fundamentally an exercise to help decision-makers understand how, and to what extent, a program is responsible for particular, measured results.



A graphic illustration of program impact would look like this.

Evaluations require: Data collection at the start of a program (to provide a baseline) and again at the end, rather than at repeated intervals during program implementation. A control or comparison group in order to measure whether the changes in outcomes can be attributed to the program with well-planned study design.

The purpose of evaluation is that Evaluation helps program managers identify what is and is not working as well as how to make the projects work better. It also provides a means of demonstrating project staff and donor agencies, the extent to which the project is achieving its objectives. it provides many benefits to social programs. It permits us to;

- identify successful strategies
- modify or discontinue interventions that do not yield desired results
- share findings with programs in other countries or regions
- provide donors/ funders with evidence of the result of their investment
- demonstrate the organization's interest in accountability

Levels of evaluation:

An important first step in the designing an evaluation is to decide if it will be performed at the population or program level. Key factors in decision making are the intended audience and the expected reach of the intervention.

Evaluation at the population level

This relates to the entire population of a given geographical area e.g. city district or country who fit the profile for the intended audience, whether or not they participated or were exposed to program activities. Thus it answers the question how effective was this intervention in reaching or changing behavior among the intended audience as a whole? This type of evaluation is appropriate for large scale programs designed to be far reaching, such as behavior change programs that use the mass media in an attempt to reach the general public.

Evaluation at the program level

By contrast NGOs projects like on HIV/AIDS are often smaller in scope, focusing on subgroups in the population with specific characteristics; adolescents in schools, commercial sex workers, truck drivers, fisher mongers, factory workers, sero positive individuals and other definable groups in a determined geographical area. Program level evaluation therefore involves only those persons exposed to the program activities e.g participants in training courses, persons attending a VCT service, persons residing in target communities like slums. This type of evaluation answers the question, how effective was the intervention in changing behavior among those exposed to it? One could use a term project level evaluation with respect to projects although program level evaluation applies to both programs and projects.

What do we want to learn from evaluation?

Evaluation can answer three basic questions,

- How well has the project been implemented?
- Has the desired change been achieved?
- If the change has been achieved, to what extent can the change be attributed to the projects?

Depending upon which question we want to answer, we choose one of the three evaluation types.

1. Process evaluation
2. Monitoring of results (outputs and outcomes)
3. Impact assessment (Measuring cause and effect)

Another kind of evaluation is cost effectiveness analysis which relates project costs to results achieved. However this type of study requires specialized analytical or statistical skills that go beyond the scope of evaluation. Nevertheless, cost issues are important to consider, since they have implications both in terms of sustainability of project activities and outcomes and whether interventions can be successfully brought to scale.

Process evaluation:

This is the measurement of products and services provided by a program and the quality for those services and products. It allows us to gain an in depth understanding of a project implementation, including;

- number of activities carried out often in relation to the original plan
- quality of the activities implemented
- reaction of the target audience (e.g. user of client certification)
- problems or obstacles encountered

It answers the questions, “How much have we done?, How well have we done it? And how can we improve?”

Process evaluation entirely looks on the implementation of program activities. It does not measure how effective these activities were in producing the desired results. The greatest benefit of this type of evaluation is its ability to identify why the project is in full operation - the successful aspects to be continued and the deficiency to be addressed. If program managers evaluate in a timely fashion, they can use results to make mid course collections, thus increasing the chances that the program will ultimately achieve its objectives.

This type of evaluation – monitoring of program activities – is most important for the organization implementing the project and other stake holders’ e.g. local government. It is also of interest to the donor agency in that, it demonstrates that the implementing agent is actively seeking to improve its services and to satisfy the needs of the intended audience.

Monitoring of Results (Outputs and outcomes):

Process evaluation is generally easier than measuring results, especially when process evaluation involves counting number of activities completed or number of clients/ participants. Process evaluation however, is only the first step. What we really want to know is whether the project is making a difference. In a sense we would like to know the project's effect by measuring knowledge, attitudes, skills, behaviors and practices of the population which we are trying to help.

Successful projects have clear, realistic and measurable objectives. Monitoring of results measures the extent to which the results or desired change is achieved. Or in other words the extent to which the objectives are made. Generally, the change in question relates to knowledge, attitudes or practices. Monitoring of results allows us to determine if the desired change has occurred among the intended audience and, if so how large the change is.

To measure change the evaluator must have data from before and after the intervention. Alternatively, the evaluator can establish the expected level to be achieved in terms of absolute numbers or percentages. And then determine whether the project achieves this level in a given period of time. For example by the end of year one, 20 percent of males 15-19 will report condom use at last sex. Often however, we do not know the pre intervention level, which is a limitation of this alternative. As a result the increasing number of NGO's are conducting baseline (pre intervention) assessments such as small scale, population based cluster surveys. They not only use findings fro this assessment to set targets for key project outcomes but also to build consensus among different stake holders in terms of local needs and priorities.

Impact Assessment (Cause and Effect):

This is the measurement of health, economic status and quality of life of the target population. It focuses on population based measures. Certain study designs – called experimental designs – allow us to evaluate cause and effects with relative precision. The most widely known of these designs is the pretest – post test control group designs with randomization. (Fisher and Foreit 2002). With this type of design, we are able to measure the amount of change attributable to the intervention, eliminating the possibility that confounding factors unrelated to the program influenced the results obtained. We can answer the question, what would have happened in the absence of our program?

In addition to experimental designs, other methodologies exist that can measure program effects. Other widely used methods include longitudinal multivariate analysis and multi-level multivariate analysis. Using appropriate statistical techniques, the evaluator can measure the extent of change that has occurred. Moreover, he/she can identify the relative importance of different factors-including exposure to the program intervention-to explain the observed change. However, due to the large samples and complex statistical analysis required, this type of approach may not be practical for NGOs working in HIV/AIDS.

Following, we present an illustrative project and explain how three types of evaluation will apply to it. The illustrative project involves commercial sex workers (CSWs).For the sake of this illustration, let us say that the objective of this project is to increase knowledge of the correct use of condoms among participating CSWs.

The intervention intended to achieve this objective is a series of workshops addressing the correct use of condoms, which will be carried out in places established especially for CSWs such as “safe haven” locations that exist for CSWs in a number of countries. Each participating CSW is expected to attend a workshop of one hour. The evaluator measures” correct use of condoms based on the ability to complete actions:

1. Open the packet without using teeth or scissors(using the finger tips)
2. Remove the air from the tip of the condom
3. Unroll the condom using the “dildo” (anatomical model) to the base of the erect penis.

Why Is M&E Important?

Monitoring and evaluation helps program implementers to make informed decisions regarding program operations and service delivery based on objective evidence Ensure the most effective and efficient use of resources objectively assess the extent to which the program is having or has had the desired impact, in what areas it is effective, and where corrections need to be considered. Meet organizational reporting and other requirements, and convince donors that their investments have been worthwhile or that alternative approaches should be considered.

Examples of questions that M&E can answer:

- Was the program implemented as planned?
- Did the target population benefit from the program and at what cost?
- Can improved health outcomes be attributed to program efforts?
- Which program activities were more effective and which less effective?

When Should M&E Take Place?

M&E is a continuous process that occurs throughout the life of a program. To be most effective, M&E should be planned at the design stage of a program, with the time, money, and personnel that will be required calculated and allocated in advance. Monitoring should be conducted at every stage of the program, with data collected, analyzed, and used on a continuous basis. Evaluations are usually conducted at the end of programs. However, they should be planned for at the start because they rely on data collected throughout the program, with baseline data being especially important. One rule of thumb is that 5-10% of a project budget should be allocated for M&E.

The M&E Plan

Every project or intervention should have a monitoring and evaluation (M&E) plan. This is the fundamental document that details a program’s objectives, the interventions developed to achieve these objectives, and describes the procedures

that will be implemented to determine whether or not the objectives are met. It shows how the expected results of a program relate to its goals and objectives, describes the data needed and how these data will be collected and analyzed, how this information will be used, the resources that will be needed, and how the program will be accountable to stakeholders.

M&E plans should be created during the design phase of a program and can be organized in a variety of ways. Typically, they include:

- The underlying assumptions on which the achievement of program goals depend
- The anticipated relationships between activities, outputs, and outcomes
- Well-defined conceptual measures and definitions, along with baseline values
- The monitoring schedule
- A list of data sources to be used
- Cost estimates for the M&E activities
- A list of the partnerships and collaborations that will help achieve the desired results
- A plan for the dissemination and utilization of the information gained
- An M&E plan should be considered a living document and revised whenever a program is modified or new information is needed.

Why Are M&E Plans Important?

M&E plans are very important because they state how a program will measure its achievements and therefore provide accountability by documenting consensus and providing transparency to guide the implementation of M&E activities in a standardized and coordinated way of preserving the institutional memory.

M&E Plan Components:

Typically, the components of an M&E plan include:

- The introduction
- The program description and framework
- A detailed description of the plan indicators
- The data collection plan
- A plan for monitoring
- A plan for evaluation
- A plan for the utilization of the information gained
- A mechanism for updating the plan

M&E Plan Components: Introduction:

The introduction to the M&E plan should include the Information about the purpose of the program, the specific M&E activities that are needed, and why they are important and then A development history that provides information about the motivations of the internal and external stakeholders and the extent of their interest, commitment, and participation

Program Description and Frameworks:

The program description should include: A problem statement that identifies the specific problem to be addressed. This concise statement provides information about the situation that needs changing, who it affects, its causes, its magnitude, and its impact on society. The program goal and objectives: The goal is a broad statement about a desired long-term outcome of the program. For example, improvement in the reproductive health of adolescents or a reduction in unwanted pregnancies in X population would be goals. Objectives are statements of desired specific and measurable program results. Examples of objectives would be to reduce the total fertility rate to 4.0 births by year X or to increase contraceptive prevalence over the life of the program. Descriptions of the specific interventions to be implemented and their duration, geographic scope, and target population The list of resources needed, including financial, human, and those related to the infrastructure (office space, equipment, and supplies)

The conceptual framework, which is a graphical depiction of the factors thought to influence the problem of interest and how these factors relate to each other. The logical framework or results framework that links the goal and objectives to the interventions. Program Description: SMART Objectives The objectives listed in the program description should be "SMART," an acronym that stands for:
Specific: Is the desired outcome clearly specified?
Measurable: Can the achievement of the objective be quantified and measured?
Appropriate: Is the objective appropriately related to the program's goal?
Realistic: Can the objective realistically be achieved with the available resources?
Timely: In what time period will the objective be achieved?
Here is a sample objective. Do you think it is SMART (i.e., meets all of the criteria above)?
Increase contraceptive prevalence by 15% in women 30-49 years of age

An example of the SMART objective is:
Increase contraceptive prevalence by 15% in women 30-49 years of age
Specific: Yes, the intended outcome of the program is specified.
Measurable: Yes, contraceptive prevalence is measurable.
Appropriate: Unknown, because the program's goal would need to be provided in order to know whether the objective relates logically to it.
Realistic: Unknown, because the resources available to the program would need to be known.
Timely: No, the time within which the objective is to be achieved is not specified.
So this objective is not "SMART" because, although it meets some of the criteria, it does not meet them all.

Indicators:

Indicators are clues, signs or markers that measure one aspect of a program and show how close a program is to its desired path and outcomes. They are used to provide benchmarks for demonstrating the achievements of a program. One of the most critical steps in designing an M&E system is selecting appropriate indicators. The M&E plan should include descriptions of the indicators that will be used to monitor program implementation and achievement of the goals and objectives. We

will discuss the selection and use of indicators later in this course. Examples of indicators include:

- Number of health workers trained in IUD insertion in the past 12 months
- Percentage of women of reproductive age who are using a contraceptive method at a particular point in time
- The number of maternal deaths per 100,000 live births in a specified period

Data Sources and Data Collection Plan:

Data sources are sources of information used to collect the data needed to calculate the indicators.

The data collection plan should include diagrams depicting the systems used for data collection, processing, analysis, and reporting. The strength of these systems determines the validity of the information obtained. Potential errors in data collection, or in the data themselves, must be carefully considered when determining the usefulness of data sources. We will discuss data sources, data collection and data quality later in this course. Examples of data sources include:

- Patient records
- Birth registers
- Sentinel/demographic surveillance
- Censuses
- Focus groups
- Household surveys

Monitoring Plan:

The monitoring plan describes: Specific program components that will be monitored, such as provider performance or the utilization of resources, How this monitoring will be conducted, The indicators that will be used to measure results, Because monitoring is concerned with the status of ongoing activities, output indicators, also known as process indicators, are used. For example, these indicators might be: How many children visit a child health clinic in one month? And How many of these children are vaccinated during these visits?

Evaluation Plan:

The evaluation plan provides the specific research design and methodological approaches to be used to identify whether changes in outcomes can be attributed to the program. For instance, if a program wants to test whether quality of patient care can be improved by training providers, the evaluation plan would identify a research design that could be used to measure the impact of such an intervention. One way this could be investigated would be through a quasi-experimental design in which providers in one facility are given a pretest, followed by the training and a posttest. For comparison purposes, a similar group of providers from another facility would be given the same pretest and posttest, without the intervening training. Then the test results would be compared to determine the impact of the training.

Information Dissemination and Use:

How the information gathered will be stored, disseminated, and used should be defined at the planning stage of the project and described in the M&E plan. This will help ensure that findings from M&E efforts are not wasted because they are not shared. The various users of this information should be clearly defined, and the

reports should be written with specific audiences in mind. Dissemination channels can include written reports, press releases and stories in the mass media, and speaking events.

Implementation and Mechanism for Update:

The capacities needed to implement the efforts described in the M&E plan should be included in the document. A mechanism for reviewing and updating the M&E plan should also be included. This is because changes in the program can and will affect the original plans for both monitoring and evaluation.

Standards for M&E Plans:

M&E plans should serve the information needs of the intended users in practical ways. These users can range from those assessing national program performance at the highest central levels to those allocating resources at the district or local level. M&E plans should convey technically accurate information and should be realistic, prudent, diplomatic, and frugal. The activities described in M&E plans should be conducted legally, ethically, and with regard to those involved in and affected by them.

What Are Frameworks?

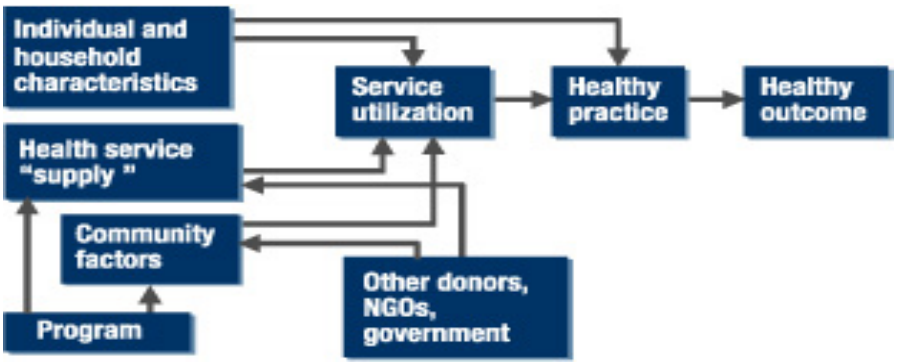
Frameworks are key elements of M&E plans that depict the components of a project and the sequence of steps needed to achieve the desired outcomes. They help increase understanding of the program's goals and objectives, define the relationships between factors key to implementation, and delineate the internal and external elements that could affect its success. They are crucial for understanding and analyzing how a program is supposed to work.

There is no one perfect framework and no single framework is appropriate for all situations, but several common types will be discussed here:

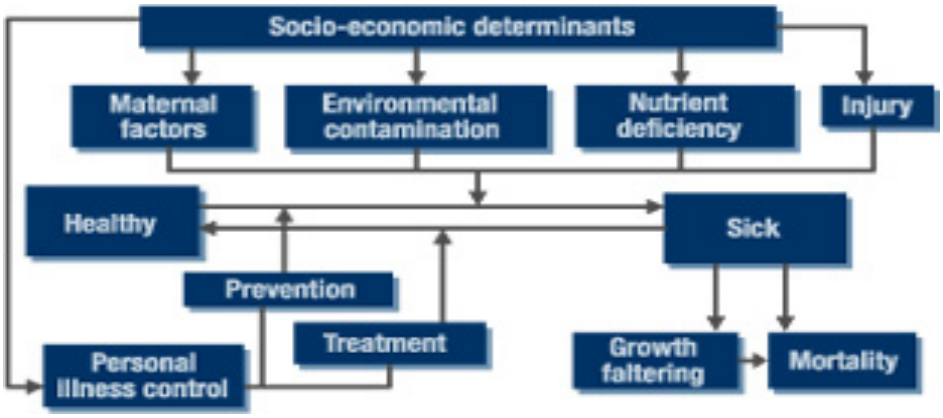
- Conceptual framework
- Results framework
- Logic model

A fourth common type of framework, not discussed in this course, is a logical framework, a diagram or matrix that illustrates the linear relationships between key program inputs, activities, immediate results/outputs, and desired outcomes.

Conceptual Frameworks



A conceptual framework, sometimes called a "research framework," is useful for identifying and illustrating the factors and relationships that influence the outcome of a program or intervention. Conceptual frameworks are typically shown as diagrams illustrating causal linkages between the key components of a program and the outcomes of interest. For instance, in this example, the program, in addition to other donors, is supplying health services, in order to increase service utilization, with the ultimate outcome of improved health. By identifying the variables that factor into program performance and depicting the ways that they interact, the results that can reasonably be expected from program activities are outlined. Clarifying this process permits program designers to develop valid measures for evaluating the success of the outcomes and also guides the identification of appropriate indicators. We will discuss the selection and use of indicators in the next section of this course.



Another example of a conceptual framework, the Mosley-Chen Framework, is commonly used in the study of child survival. In this framework, socio-economic determinants act through five "proximate" or biological determinants to impact child health.

- Maternal factors (age, parity, birth interval)
- Environmental contamination (air, food, water, soil, insect vectors)
- Nutrient deficiency (calories, proteins, vitamins, minerals)
- Injury (accidental or intentional)
- Personal illness control (preventive measures and medical treatment)

The is no standard format for conceptual frameworks, but the two examples shown here are typical.

Results Frameworks

Results frameworks, sometimes called "strategic frameworks," diagram the direct causal relationships between the incremental results of the key activities all the way up to the overall objective and goal of the intervention. This clarifies the points in an intervention at which results can be monitored and evaluated. As can be seen in this example, results frameworks include an overall goal, a strategic objective (SO) and intermediate results (IRs). An SO is an outcome that is the most ambitious result that can be achieved and for which the organization is willing to be held responsible. An IR is a discrete result or outcome that is necessary to achieve an SO.

Notice that the goal and strategic objective appear at the top of the framework. Before achieving this broader strategic objective, a set of "lower level" intermediate results must first be reached. Under each IR are subordinate intermediate results or sub-IRs that relate directly to the intermediate results. For example, under IR1, you will see IR1.1 and IR 1.2. IR1.1 and IR 1.2 are sub-IRs. Results frameworks are the type of framework used by USAID in what is called Performance Monitoring Plans, or PMPs.

Here is a portion of the same results framework with the information filled in. For example, as you can see under IR2, the information system, training and supervision of clinicians, and provider performance are factors that lead to improved quality of health services. Notice that IRs and sub-IRs need to be measurable; in other words, indicators can be developed for them and data can be collected to calculate them. Please note that actual frameworks contain more information than appears here in these abbreviated examples.

Logic Models

A logic model, sometimes called an "M&E framework," provides a streamlined linear interpretation of a project's planned use of resources and its desired ends.

Logic models have five essential components:

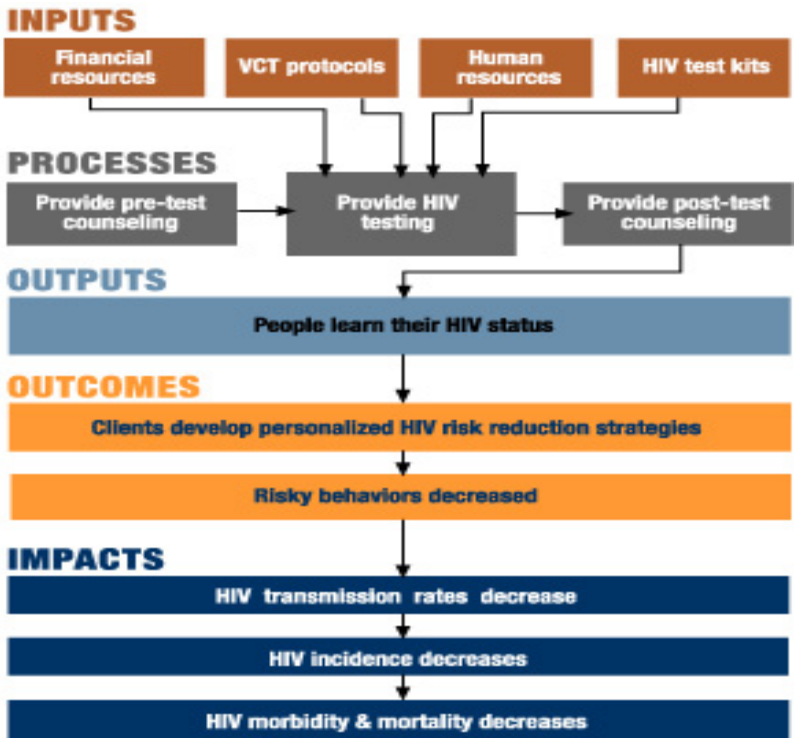
Inputs – the resources invested in a program, for example, technical assistance, computers, condoms, or training

Processes – the activities carried out to achieve the program's objectives

Outputs – the immediate results achieved at the program level through the execution of activities

Outcomes – the set of short-term or intermediate results at the population level achieved by the program through the execution of activities

Impacts – the long-term effects, or end results, of the program, for example, changes in health status. In this context, the term "impact" refers to the health status or conditions that the program is intended ultimately to influence (mortality, morbidity, fertility, etc.), as measured by appropriate indicators. Measuring "impact" in this way, however, should be distinguished from impact evaluation which is a specific type of evaluation activity that focuses on examining how much of an observed change in outcomes or "impact" can be attributed to the program.In other words, inputs (or resources) are used in processes (or activities) which produce immediate intermediate results (or outputs), ultimately leading to longer term or broader results (or outcomes) and impacts. This example presents a straightforward view of a project designed to reduce population morbidity by increasing the number of clients served by trained health care providers. As you can see, it does not try to account for all factors that may be influencing operations and results as a conceptual framework would, but instead focuses specifically on the project's activities and impacts. This narrow focus assists program managers and M&E planners as they clarify the direct relationships between elements of particular interest within a particular program effort.



This is a small portion from a logic model for an HIV voluntary counseling and testing (VCT) program. It is important to remember that, within a program, several activities can have their own inputs and outputs. Collectively the outputs of the activities contribute to the program outcomes and impacts. In some cases the output of one program activity could be an input for another activity. For example, if an activity is to develop guidelines, the output of that activity is the guidelines, which are an input in this overall logic model for VCT service delivery.

Summary of Frameworks

Using frameworks is one way to develop a clearer understanding of the goals and objectives of a project, with an emphasis on identifying measurable objectives, both short-term and long-term. Frameworks, such as the three types discussed in this course, also help define the relationships between factors key to the implementation and success of a project, both internal and external to the program context. This design process deepens the understanding of managers, implementers, and other partners in many practical ways, including serving as the foundation for selecting appropriate, useful M&E indicators.

Type of Framework and Brief Description	Program Management	Basis for Monitoring and Evaluation?
Conceptual– Interaction of various factors	Determines which factors the program will influence	No. Can help to explain results.
Results– Logically linked program objectives	Shows the causal relationship between program objectives	Yes – at the objective level
Logic model– Logically linked inputs, processes, outputs, and outcomes	Shows the causal relationship between inputs and the objectives	Yes – at all stages of the program from inputs to process to outputs to outcomes/ objectives

The conceptual framework places the health problem in a wider context, one that considers the various factors that can affect the program or intervention, clarifies the causal relationships between these factors, and identifies those that the intervention may affect. It is used for program design rather than for program M&E.

Results frameworks show the causal relationships between the various intermediate results that are critical to achieving the strategic objective. The effectiveness of these activities can be measured at each step along the way.

Logic models help to show the logical connections between the inputs, processes, and outputs of an activity and how they link to the program's objectives (outcomes) and goals (impacts). They also clarify the linear relationships between program decisions, activities, and products.

Programs should use the types of frameworks that best suit their needs. USAID-funded programs tend to use results frameworks, but many other donors, such as the UK Department for International Development (DFID) and the United Nations (UN), use other types of frameworks.

What Is an Indicator?

An indicator is a variable that measures one aspect of a program or project that is directly related to the program's objectives. Let's take a moment to go over each piece of this definition. Examples of indicators include:

- Percentage of clinic personnel who have completed a particular training workshop
- Number of radio programs about family planning aired in the past year
- Percentage of clinics that experienced a stock out of condoms at any point during a given time period.

An indicator is a variable whose value changes from the baseline level at the time the program began to a new value after the program and its activities have made their impact felt. At that point, the variable, or indicator, is calculated again.

Secondly, an indicator is a measurement. It measures the value of the change in meaningful units that can be compared to past and future units. This is usually expressed as a percentage or a number.

A full, complete, and appropriate set of indicators for a given project or program should include at least one indicator for each significant aspect of the program's activities.

Finally, an indicator focuses on a single aspect of a program or project. This aspect may be an input, an output, or an overarching objective, but it should be narrowly defined in a way that captures this one aspect as precisely as possible.

A reasonable guideline recommends one or two indicators per result, at least one indicator for each activity, but no more than 10-15 indicators per area of significant program focus.

More examples of indicators:

- Percentage of women allowed to go alone to the clinic
- Percentage of facilities that maintain acceptable storage conditions for condoms
- Number of trained providers who perform to established standards

Quantitative and Qualitative Indicators:

Indicators can be either be quantitative or qualitative.
Quantitative indicators are numeric and are presented as numbers or percentages. Qualitative indicators are descriptive observations and can be used to supplement the numbers and percentages provided by quantitative indicators. They complement quantitative indicators by adding a richness of information about the context in which the program has been operating. Examples include "availability of a clear, strategic organizational mission statement" and "existence of a multi-year procurement plan for each product offered."

Differences between qualitative and quantitative evaluation methods		
#	**quantitative methods**	**qualitative methods**
1	Describes “how many” or “how much”	Describe “how” and “why”
2	Uses predominantly closed-ended questions.	Uses predominantly open-ended questions.
3	Provides numerical data and statistics that facilitate similar interpretation by evaluators.	Provides data on perceptions, beliefs and values which can be interpreted differently by different evaluators
4	Requires large samples preferably selected at random	Permits more limited samples generally not selected at random.
5	Requires staff with experience in statistical methods.	Requires expertise in qualitative data analysis.
6	Results can be generalized to the target population.	Results can not be generalized and they are only indicative of a segment of the population.
7	Yields more superficial responses to sensitive topics e.g. sexual behavior.	Offers more in-depth responses in sensitive topics e.g. sexual behavior

Why Are Indicators Important?

Indicators provide M&E information crucial for decision-making at every level and stage of program implementation.
Indicators of program inputs measure the specific resources that go into carrying out a project or program (for example, amount of funds allocated to the health sector annually).
Indicators of outputs measure the immediate results obtained by the program (for example, number of multivitamins distributed or number of staff trained).

Indicators of outcomes measure whether the outcome changed in the desired direction and whether this change signifies program "success" (for example, contraceptive prevalence rate or percentage of children 12-23 months who received DTP3 immunization by 12 months of age).

What Is a Metric?

An important part of what comprises an indicator is the metric, the precise calculation or formula on which the indicator is based. Calculation of the metric establishes the indicator's objective value at a point in time. Even if the factor itself is subjective or qualitative, like the attitudes of a target population, the indicator metric calculates its value at a given time objectively.

Here is an example:

Indicator: Percentage of urban facilities scoring 85-100% on a Quality of Care Checklist

Note that because this indicator calls for a percentage, a fraction is required to calculate it.

Possible metrics:

Numerator, or top number of the fraction: number of urban facilities scoring 85-100% on a Quality of Care Checklist.

Denominator, or bottom number of the fraction: total number of urban facilities checked and scored.

Defining good metrics is crucial to the usefulness of any M&E plan because it clarifies the single dimension of the result that is being measured by the indicator.

Clarifying Indicators:

In many cases, indicators need to be accompanied by clarifications of the terms used. For instance, let's look at the indicator: number of antenatal care (ANC) providers trained. If such an indicator were used by a program, definitions would need to be included. For example, providers would need to be defined, perhaps as any clinician providing direct clinical services to clients seeking ANC at a public health facility. For the purposes of this indicator then, providers would not include clinicians working in private facilities. Trained would also need to be defined, perhaps as those staff who attended every day of a five-day training course and passed the final exam with a score of at least 85%. Another indicator for this program could be percentage of facilities with a provider trained in ANC. In this example, because the indicator is a proportion or fraction, a numerator and a denominator are needed to calculate it.

The numerator would be the number of public facilities with a provider who attended the full five days of the ANC training and scored at least 85% on the final exam. Note that the numerator must still specify that the facilities are public and that the providers must have attended all five days and passed the exam in order to be counted. This information need not be included in the indicator itself as long as it is in the definitions that accompany it.

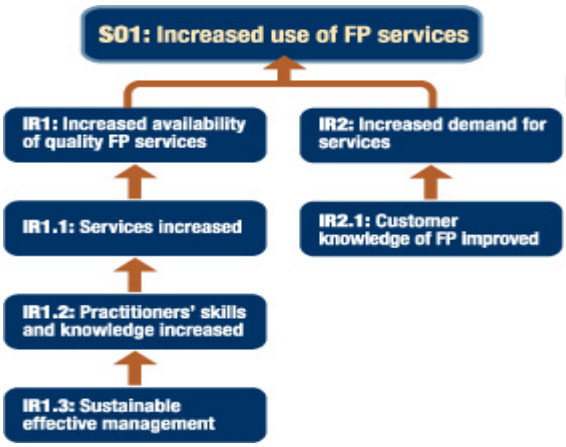
The denominator would be the total number of public facilities offering ANC services. This requires that this number be obtainable. If it is not known and it is not possible

to gather such information, this percentage cannot be calculated. In this example, it is also necessary to know at which facility each trained provider works. This information could be obtained at the time of the training. If it is not, all facilities would have to be asked if they have any providers who attended the training. To calculate the indicator in this example, let's say there were 100 public facilities with an ANC provider who completed the five-day training and scored at least 85% on the exam out of 500 facilities total. What would the indicator show?

ANSWER: The indicator would be 100 facilities with a trained provider/500 facilities total, which means 1/5 or 20% of public facilities have a provider trained in ANC.
Characteristics of Indicators

Characteristics of a good indicator:

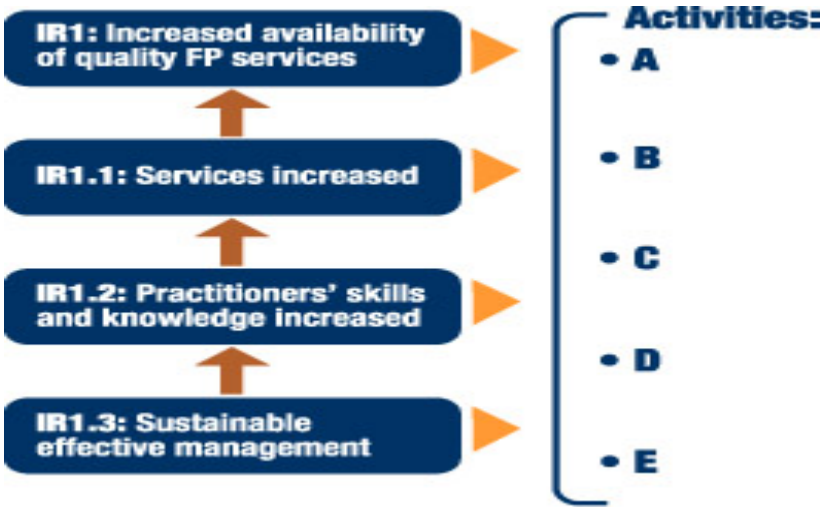
Produce the same results each time it is used to measure the same condition or event
Measure only the condition or event it is intended to measure
Reflect changes in the state or condition over time
Represent reasonable measurement costs
Be defined in clear and unambiguous terms
Indicators should be consistent with international standards and other reporting requirements. Examples of internationally recognized standardized indicators include those developed by UNAIDS and those included in the UNDP Millennium Development Goals. Indicators should be independent, meaning that they are non-directional and can vary in any direction. For instance, an indicator should measure the number of clients receiving counseling rather than an increase in the number of clients receiving counseling. Similarly, the contraceptive prevalence rate should be measured, rather than the decrease in contraceptive prevalence. Indicator values should be easy to interpret and explain, timely, precise, valid, and reliable. They should also be comparable across relevant population groups, geography, and other program factors.



Linking Indicators to Frameworks:

Let's use this generic results framework for a family planning program to demonstrate how indicators are linked to frameworks. For this program, the strategic objective (SO) is to increase the use of family planning services. There are two intermediate results (IRs) feeding into this objective. Under the IR of increasing availability of quality services, there are three sub-intermediate results (sub-IRs):

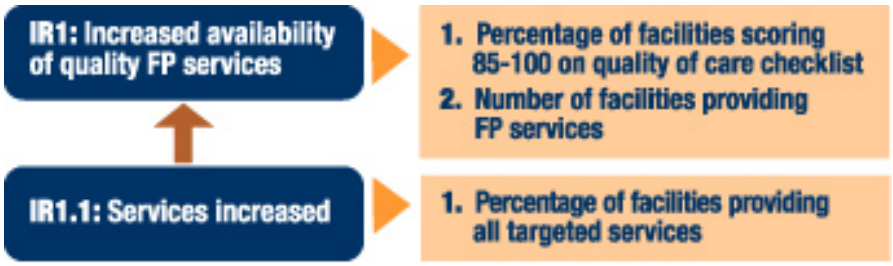
services increased, practitioners' skills and knowledge increased, and sustainable effective management. Under the other IR (increasing demand for services), the only sub-IR listed is to improve customer knowledge of family planning.



In order to develop indicators for this framework, the activities to be undertaken by the program must first be recognized. This portion of the results framework shows what activities are planned in order for the program to achieve IR1 and its sub-IRs. These activities are:

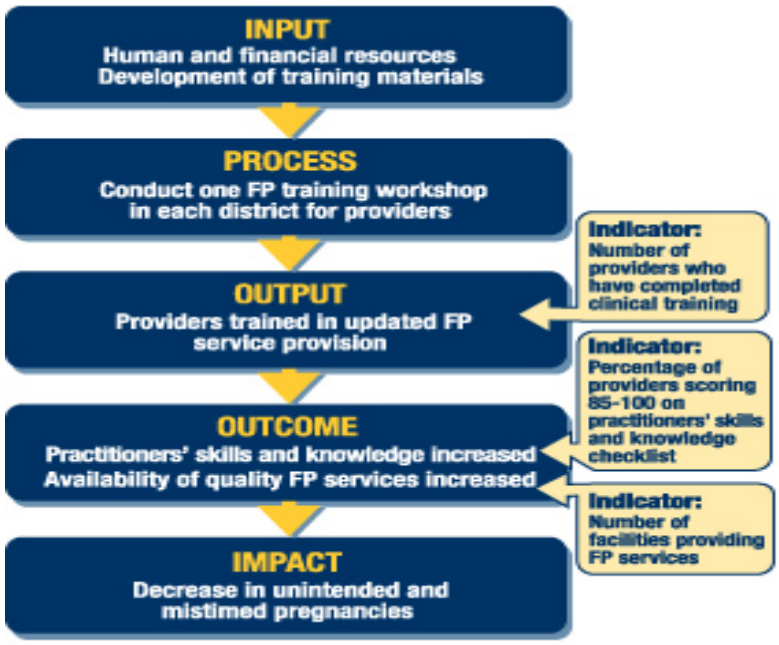
A. Provision of support and supplies to community-based distributors
B. Expanding family planning services to additional clinics
C. Clinical training for providers
D. The development of a checklist to monitor the quality of care
E. Management training for supervisors

Note that some of these activities can affect several of the sub-IRs.



Next, indicators that measure these activities would be identified. Here you can see the indicators that are linked to the IR and sub-IR1. Other indicators would be linked to the other sub-IRs. Although it is important to avoid assigning so many indicators that their measurement becomes unachievable, it is risky to rely on a single indicator to measure the significant effects of a project. If the data for that one indicator became unavailable for some reason, it would be difficult to document a significant impact on that result. Therefore, some diversification of indicators tends to strengthen M&E plans. Note that the indicators in these examples are not necessarily "perfect" indicators, just examples to suggest the connections between activities, results, and possible indicators.

Linking Indicators to Logic Models:



This example depicts how indicators are related to logic models. Here is a logic model for the same activity that was just depicted in the results framework. Three indicators are linked with this activity: Number of providers who have completed clinical training is linked to the output of having trained providers. This indicator can provide information about whether the program is meeting its targets for training providers. Percentage of providers scoring 85-100 on the practitioners' skills and knowledge checklist relates to the intended outcome of improving the knowledge and skills of practitioners. Number of facilities providing family planning services links to the intended outcome of increasing the availability of services. The assumption is that increasing the skills and knowledge of more providers will result in more facilities being able to offer services.

Some common challenges to selecting indicators:

Choosing an indicator that the program activities cannot affect for instance, imagine a program that planned to train health care providers in AIDS prevention and treatment services in an effort to expand access to these services. The authors of the M&E plan selected the UNAIDS indicator the proportion of health care facilities with adequate conditions to provide care. However, many elements can affect this indicator, such as supervision, availability of supplies and equipment, and the drafting of appropriate treatment protocols. None of these factors would be addressed by the planned training program. In using this global indicator, the planners overlooked the fact that it did not accurately reflect their program activities. Better indicators would be the number of clinicians trained or the number of facilities with a trained provider. Choosing an indicator that is too vague:

For example, imagine a radio campaign aimed at dispelling specific myths about HIV/AIDS transmission. Although the goal of the campaign is ultimately to increase

knowledge about HIV/AIDS, the indicator percentage of the population with knowledge about HIV/AIDS does not specify the exact area of knowledge in question. A better indicator would be one that measured precisely the objective of the campaign: percentage of the population not believing myths X and Y about HIV/AIDS transmission.

Selecting an indicator that relies on unavailable data

For instance, a program working on drug supply issues selected an indicator that stated percentage of days per quarter that service delivery points have stock-outs of drugs. However, information on stock-outs may not be collected often enough to provide this information.

A better indicator would be percentage of service delivery points that experienced a stock-out of drugs at some time during the last quarter.

Population-level data may also be unavailable or difficult to collect. For example, baseline numbers for immunization coverage in a certain population may be unknown.

Selecting an indicator that does not accurately represent the desired outcome:

For instance, if an IR states expanded access to antiretroviral (ARV) treatment for pregnant women to prevent mother-to-child transmission (PMTCT) of HIV, what would an appropriate indicator be? Would the indicator percentage of women on ARVs who are pregnant be appropriate?

Answer:

No, this would not be an appropriate indicator because it tells us how many women are pregnant out of all women on ARVs, rather than how many HIV-positive pregnant women are on ARVs. In other words, the numerator for this indicator is the number of women on ARVs who are pregnant and the denominator is the number of women who are on ARVs. Let's say that there were 100 pregnant women on ARVs and a total of 400 women on ARVs. The percentage would be 100/400 or 1/4 or 25%. If the denominator increased, that is, if more non-pregnant women received treatment for HIV but the number of pregnant women receiving treatment stayed the same, the indicator would decrease. For instance, if 1000 women were on ARVs, the percentage would become 100/1000 or 1/10 or 10%. The indicator would reflect this change, but this change is irrelevant to the desired outcome of the program,which is increasing the number of pregnant women on ARVs. Similarly, if the indicator increased, for instance if the percentage of women on ARVs who were pregnant out of all women on ARVs went from 25% to 50%, this may be because more pregnant women received ARV treatment (the desired outcome) but it also could be because fewer non-pregnant women were on ARVs, which would not be related to the desired outcome of the program. Because it is not clear which change occurred, this would not be a good indicator to use. Let's try another example. Would the indicator percentage of people on ARVs who are pregnant women be appropriate?

Answer:

No, this also would not be an appropriate indicator. Here the numerator is the number of pregnant women on ARVs (let's say it is 100 again) and the denominator

is the total number of people on ARVs, including all men and women and children receiving treatment (let's say it's 5000). In other words, this indicator would tell us, of all the people on ARVs, the percentage who are pregnant women is 100/5000 or 1/50 or 2%. If this indicator increased over time, say from 2% to 20%, it could be because more pregnant women were receiving ARV treatment (1000/5000, the desired effect of the program) but it could also be because fewer people overall were receiving this treatment (100/500) and the number of pregnant women receiving treatment did not actually change. Similarly, if the indicator decreased, it might be because more people overall were receiving treatment or because fewer women were HIV positive or because there were fewer pregnant women. So the information provided by this indicator would be difficult or impossible to interpret accurately. Let's try one more example: Would the indicator percentage of HIV-positive pregnant women who are on ARVs be appropriate?

Answer:
Yes, this indicator would provide the needed information.
Here the numerator is the number of HIV-positive pregnant women who are on ARVs and the denominator is the total number of HIV-positive pregnant women.
With this indicator, interpretation is not complicated by factors unrelated to the IR, such as a decrease in HIV prevalence among pregnant women or the number of non-pregnant women receiving ARVs.

Guidelines for Selecting Indicators:

Some general guidelines for the selection of indicators are:
Select indicators requiring data that can realistically be collected with the resources available. Select at least one or two indicators (ideally, from different data sources) per key activity or result. Select at least one indicator for each core activity (e.g., training event, social marketing message, etc.). Select no more than 8-10 indicators per area of significant program focus. Use a mix of data collection sources whenever possible. (We will discuss data sources in the next section of this course.)

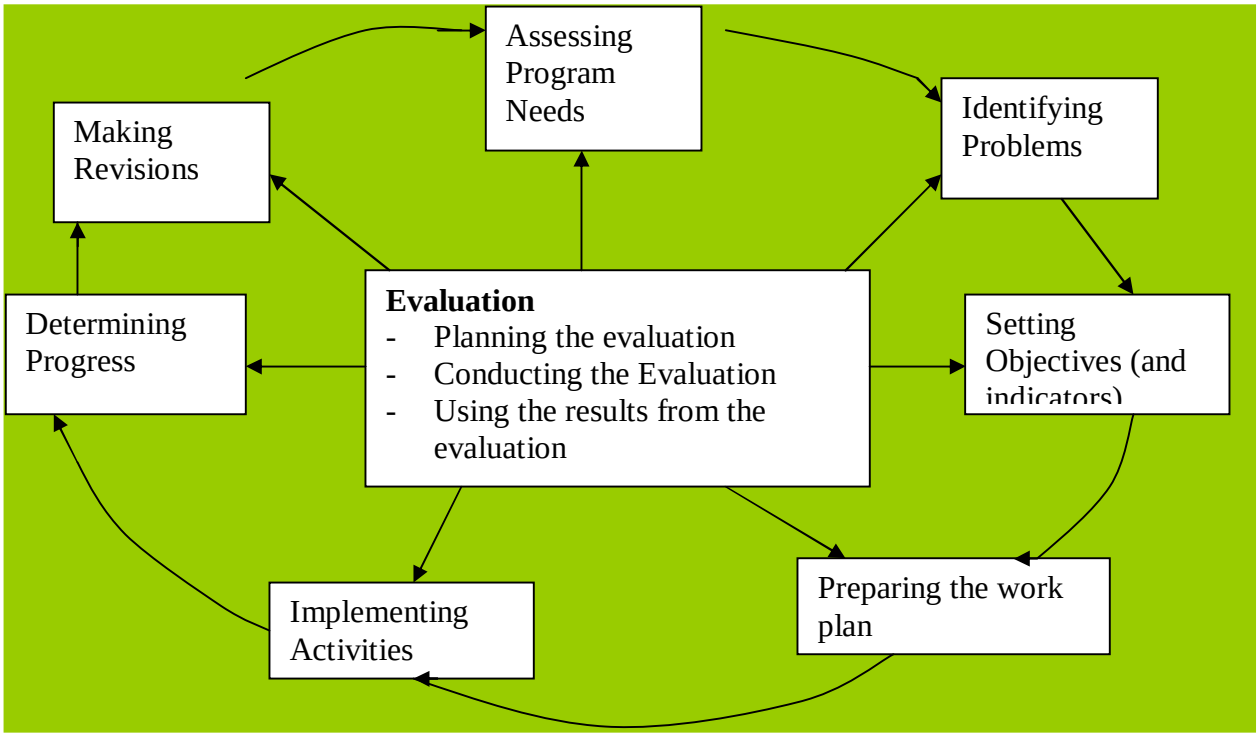
Linking Evaluation to the Program Planning and Implementation cycle:

The steps that an organization or program goes through in managing its activities can be presented as a continuous cycle of management actions from assessing needs, to planning and implementing activities, to measuring final programmatic outcomes, the results of which feed back into the planning stage to start the cycle again. Whether an evaluation is conducted internally by program staff or by an external consultant, there are three main elements in any evaluation:

- planning the evaluation
- conducting the evaluation
- Using the results.

As shown in the diagram below, these elements of evaluation are directly linked to the steps in planning and implementing your program or project.

Evaluation as part of the program planning and Implementation Cycle



Evaluation is part of and relates to each stage of the cycle, and, as already noted, all of the program's participants-managers, staff, and target population (beneficiaries)-should be involved through out the process. In this way, participants involved in different aspects of the program will understand the need to implement any necessary changes indicated by the evaluation, and will be motivated to work together to achieve the desired results.

Incorporate Evaluation into Program Planning and Implementation:

Looking more closely at the elements and their subsets, you can see how important it is to think about how you will evaluate your program at the same time that you are developing your program objectives and work plan. The following chart breaks down the steps in the evaluation process and shows how they directly relate to the steps in the planning and implementation cycle.

Evaluation process	**Link to Program Planning and Implementation process**
Planning the Evaluation	**Assessing Program Needs, Identifying problems, Setting Objectives, Preparing the Work plan**
Identify the objective of the evaluation. What do you want to evaluate? Why do you want to evaluate it? Who needs what kind of information? How will they use the information and apply the results to improve the program	In order to focus and plan the evaluation, you will need to know the main purpose of the program. What are the primary problems that the program or project intends to address?

Decide on the scope of the evaluation. Are you measuring the achievement of short term objectives or the long-term impact of the program? Will the evaluation be conducted by the staff person or by an external consultant? How will you involve others from the organization in the evaluation? How much time and money can you afford to spend on the evaluation? **Select indicators and standards for the evaluation.** Are they consistent with the objectives of the evaluation and those of your program? **Identify sources of data and plan for and decide how you will collect the data?** What methodologies will you use in evaluation? Are these methodologies appropriate to the data you want to collect (and appropriate use of your clients and / or staff if you are collecting data from them)?	As you develop your strategic and operational work plans for the program, you will develop both long-term goals and short-term specific objectives. These goals and objectives should also be used as a criteria and indicators for evaluating your program, initially in internal evolutions to see if you are meeting your short-term objectives, and then in later evaluations (either internal or external) to see whether you are making progress towards achieving your long-term goals In addition as part of developing your work plan, you need to decide when evaluations will be undertaken and develop budgets and timelines for conducting them along with other program activities.
Conducting the evaluation	**Implementing activities and determining progress**
Carry out the data collection. Who will be directly involved in collecting data? How will you keep other stakeholders informed of your progress **Organize and analyzed the data.** How will the data be analyzed – in charts, graphs or narrative summaries?	In order to conduct an evaluation, your program needs to have been implementing program activities for at least several months. Program activities include providing the service planned, regularly monitoring and implementation of activities, supervising staff and following routine reporting procedures. Any evaluation that takes place will rely on using data from routine service statistics as well as talking to clients, staff and supervisors.
Using the Results	**Making revisions and assessing the program needs**
Formulate recommendations and present them with the findings. How will you present the results of the evaluation e.g. charts, graphs and who will be involved in making the presentations? What is the best way of making recommendations for change?	It will be difficult to know how to make revisions in the program and identify new program needs or changes that should be made to the program without evaluation. Here the evaluation process is very closely linked to the program planning and implementation cycle.

Encourage staff to implement the recommendations and make program improvements. How will you work with staff at all levels to implement the recommendations?	Whether you want to identify how you can better achieve your objectives and make a grater impact, what you could be doing differently or what new needs may have developed in your target population since the program started, the evaluation will help you determine what you and your staff need to do and will allow you to discuss and formulate actions that can be incorporated into the next work plan.

Types of Data Sources

Data sources are the resources used to obtain data for M&E activities. There are several levels from which data can come, including client, program, service environment, population, and geographic levels. Regardless of level, data are commonly divided into two general categories: routine and non-routine.

Routine data sources provide data that are collected on a continuous basis, such as information that clinics collect on the patients utilizing their services. Although these data are collected continuously, processing them and reporting on them usually occur only periodically, for instance, aggregated monthly and reported quarterly. Data collection from routine sources is useful because it can provide information on a timely basis. For instance, it can be used effectively to detect and correct problems in service delivery. However, it can be difficult to obtain accurate estimates of catchment areas or target populations through this method, and the quality of the data may be poor because of inaccurate record keeping or incomplete reporting.

Non-routine data sources provide data that are collected on a periodic basis, usually annually or less frequently. Using non-routine data avoids the problem of incorrectly estimating the target population when calculating coverage indicators. Another advantage is that both those using and those not using health facilities are included in the data. Non-routine data have two main limitations: collecting them is often expensive, and this collection is done on an irregular basis. In order to make informed program decisions, program managers usually need to receive data at more frequent intervals than non-routine data can accommodate.

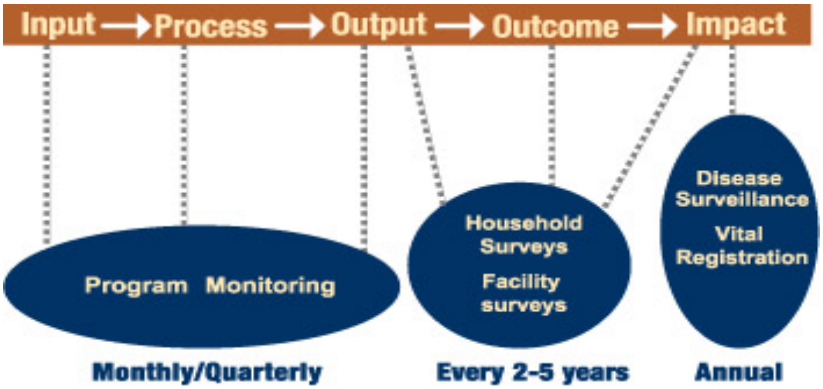
Examples of routine data sources:

- Vital registration records
- Clinic service statistics
- Demographic surveillance

Examples of non-routine data sources:

- Household surveys, such as DHS
- National censuses
- Facility surveys

Different Sources, Same Indicator



Data from different sources can be used to calculate the same indicator, although changes to the metric may be necessary. This illustration depicts one way that routine and non-routine data can be used together to provide for an effective M&E system. For example, basing on the types of evaluation questions depending on the focus of the evaluation

Types of evaluation questions depending on the focus of the evaluation	
Relevance	Are the programs, services and strategies appropriate to the needs they are supposed to address?
Adequacy	Is the program addressing all the needs it is designed to address?
Progress	Is the program doing what it planned to do within the planned amount of time and in accordance with the budget?
Effectiveness	Is the program achieving its intermediate objectives and serving the needs of its clients?
Impact	Has the program produced the expected long term results?
Efficiency	Are the results of the program (outputs) appropriate to the use of its resources (inputs)?
Sustainability	Is the program/ organization providing quality services to its clients, increasing or maintaining demand for services, and generating income locally while decreasing its dependency on funds from external donors?

If population-based survey data are used, the definition could be proportion of children age 12-23 months who were immunized with the first dose of DTP vaccine before age 12 months.
Numerator: Number of children age 12-23 months who were immunized with the first dose of DTP vaccine before age 12 months
Denominator: Total number of children age 12-23 months surveyed
If a routine data source is used, such as clinic records, the definition could be proportion of infants 0-11 months of age in a specified calendar year who were immunized with the first dose of DTP vaccine in that calendar year.
Numerator: Number immunized by age 12 months with the first dose of DTP vaccine in a given year

Denominator: Total number of surviving infants less than 12 months of age in the same year
Whenever several options for data sources exist, the advantages and disadvantages of each should be weighed when selecting which to use.

Data Collection

The M&E plan should include a data collection plan that summarizes information about the data sources needed to monitor and/or evaluate the program.
The plan should include information for each data source such as:
The timing and frequency of collection
The person/agency responsible for the collection
The information needed for the indicators
Any additional information that will be obtained from the source will depend on the differences between qualitative and quantitative evaluation methods

Data Quality

Throughout the data collection process it is essential that data quality be monitored and maintained. Data quality is important to consider when determining the usefulness of various data sources; the data collected are most useful when they are of the highest quality.
It is important to use the highest quality data that are obtainable, but this often requires a trade off with what it is feasible to obtain. The highest quality data are usually obtained through the triangulation of data from several sources. It is also important to remember that behavioral and motivational factors on the part of the people collecting and analyzing the data can also affect its quality.
Some types of errors or biases common in data collection include:
Sampling bias: occurs when the sample taken to represent population values is not a representative sample
Non-sampling error: all other kinds of mis-measurement, such as courtesy bias, incomplete records, or non-response rates
Subjective measurement: occurs when the data are influenced by the measurer
Here are some data quality issues to consider:
Coverage: Will the data cover all of the elements of interest?
Completeness: Is there a complete set of data for each element of interest?
Accuracy: Have the instruments been tested to ensure validity and reliability of the data?
Frequency: Are the data collected as frequently as needed?
Reporting Schedule: Do the available data reflect the time periods of interest?
Accessibility: Are the data needed collectable / retrievable?
Power: Is the sample size big enough to provide a stable estimate or detect change?

Data analysis

Analyzing the data you have collected is often one of the most difficult aspects of evaluation and requires careful planning. In analyzing the data, you need to develop skills in finding patterns in the data and to have the ability to isolate critical facts

and information from other information that is not so important. How you analyze the data depends greatly on how the data were collected. In some evaluations the major interest may be to measure short-term progress by comparing numbers and information with different service sites with in the program or the organization. In other evaluations, you may want to measure your programs success by comparing the programs achievements against the baseline established by your programs.

Data Use

The term data refers to raw, unprocessed information while information, or strategic information, usually refers to processed data or data presented in some sort of context. Collecting data is only meaningful and worthwhile if it is subsequently used for evidence-based decision-making. To be useful, information must be based on quality data, and it also must be communicated effectively to policy makers and other interested stakeholders. M&E data need to be manageable and timely, reliable, specific to the activities in question, and the results need to be well understood. The key to effective data use involves linking the data to the decisions that need to be made and to those making these decisions. The decision-maker needs to be aware of relevant information in order to make informed decisions. For example, if sales data from a program to provide insecticide-treated bednets show that the program is successfully increasing bednet distribution, the decision-maker may decide to maintain the program as is. Alternatively, the data may prompt the implementation of a new distribution system and could spur additional research to test the effectiveness of this new strategy compared to the existing one. When decision-makers understand the kinds of information that can be used to inform decisions and improve results, they are more likely to seek out and use this information.

Glossary of Terms

Conceptual Framework	A diagram of a set of relationships between factors that are believed to impact or lead to a target condition. It is the foundation of project design, management, and monitoring. Synonym: Conceptual model
Data Sources	The resources used to obtain the data needed for M&E activities. These sources may include, among many others, official government documents, clinic administrative records, staff or provider information, client visit registers, interview data, sentinel surveillance systems, and satellite imagery.
Evaluation	A process that attempts to determine as systematically and objectively as possible the relevance, effectiveness, and impact of activities in light of their objectives.
Framework	An open set of tools for project planning, design, management, and performance assessment. Frameworks help to identify project elements (goals, objectives, outputs, outcomes), their causal relationships, and the external factors that may influence success or failure of the project. A framework matrix provides an easy overview of key project information that allows assessment of

	project logic as well as performance monitoring and evaluation.
Goal	A broad statement of a desired, long-term outcome of a program. Goals express general program intentions and help guide a program's development. Each goal has a set of related, more specific objectives that, if met, will collectively permit program staff to reach the stated goal.
Impact	The anticipated end results or long-term effects of a program. For example, changes in health status such as reduced disease incidence or improved nutritional status.
Impact Evaluation	A set of procedures and methodological approaches that show how much of the observed change in intermediate or final outcomes, or "impact," can be attributed to the program. It requires the application of evaluation designs to estimate the difference in the outcome of interest between having or not having the program.
Indicators	Quantitative or qualitative measures of program performance that are used to demonstrate change and which detail the extent to which program results are being or have been achieved. Indicators can be measured at each level: input, process, output, outcome, and impact.
Inputs	The human and financial resources, physical equipment, clinical guidelines, and operational policies that are the core ingredients of programs and enable programs to be delivered.
Intermediate Result (IR)	An important result that is seen as an essential step to achieving a strategic objective (SO) in a results framework. IRs are measurable results that may capture a number of discrete and more specific results. IRs may also help to achieve other IRs.
Logic Model	A program design, management, and evaluation tool that describes the main elements of a program and how these elements work together to reach a particular goal. The basic elements in describing the implementation of a program and its effects are: inputs, activities or processes, outputs, outcomes, and impacts. A logic model graphically presents the logical progression and relationship of these elements.
Logical Framework	A dynamic planning and management tool that logically relates the main elements in program and project design and helps ensure that an intervention is likely to achieve measurable results. It helps to identify strategic elements (inputs, outputs, purposes, goal) of a program, their causal relationships, and the external factors that may influence success or failure. It can provide the basis for monitoring progress achieved and evaluating program results.
Metric	The precise calculation or formula that provides the value of an indicator.
Monitoring	Monitoring is the routine process of data collection and measurement of progress toward program objectives. It involves tracking what is being done and routinely looking at the types and levels of resources used; the activities conducted; the products and services generated by these activities, including the quality of services; and the outcomes of these services and products.

Monitoring and Evaluation (M&E) Plan	A comprehensive planning document for all monitoring and evaluation activities within a program. This plan documents the key M&E questions to be addressed: what indicators will be collected, how, how often, from where, and why; baseline values, targets, and assumptions; how data are going to be analyzed/interpreted; and how/how often reports will be developed and distributed.
Non-routine data sources	Resources that provide data collected on a periodic basis, usually annually or less frequently. In addition to large-scale household surveys, they may include small-scale, ad-hoc household surveys, special studies, and national censuses.
Objectives	Significant development results that contribute to the achievement of goals and provide a general framework for more detailed planning for specific programs. Several objectives can contribute to each goal. Examples: "to reduce the total fertility rate to 4.0 births by Year X," or "to increase contraceptive prevalence over the life of the program."
Outcomes	The changes measured at the population level in the program's target population, some or all of which may be the result of a given program or intervention. Outcomes refer to specific knowledge, behaviors, or practices on the part of the intended audience that are clearly related to the program, can reasonably be expected to change over the short-to-intermediate term, and that contribute to a program's desired long-term goals. Examples would be "the percentage of clients in a stop smoking program who are nonsmokers six months after the program ends," or "the percentage of married women, 15-44, using contraception one year after a family planning intervention."
Outputs	The results of activities achieved at the program level, in two forms: the number of activities performed (e.g., number of service providers trained) and measures of service utilisation (e.g., number of contraceptives distributed).
Problem Statement	A statement in an M&E plan that describes the nature and extent of the problem to be addressed by an intervention. It clearly states the specific problem and includes a quantitative element that describes the magnitude of the problem and its impact on society. The statement should also include a description of other efforts that are addressing the problem and definitions of relevant terms. An example of a problem statement is: A recent situation analysis of District A demonstrated limited access to young adult reproductive health services. Young adults (ages 15-24) account for 30% of the population in District A, yet reproductive health service statistics show that only 5% of the people using the services were in this age range. Anecdotal evidence from district health workers suggests a high incidence of unwanted pregnancies and a high prevalence of HIV/AIDS among young adults. As part of the national commitment to improve the reproductive health of young adults, the Ministry of Health will implement a five-year project

	aimed at increasing access to youth-friendly health services by improving the infrastructure necessary to deliver such services, and in partnership with the Ministry of Education and Youth, focusing on reproductive health education for youth ages 10-24.

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Rossi PH, Freeman HE, and M Lipsey. 1999. Evaluation: A Systematic Approach. Thousand Oaks, CA: Sage Publications.

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Course Name	: Research Methods

Course Description
This Course explores basic philosophy of research, its types and variables, its defines sampling design, research design, methods/tools of data collection, planning the survey as a tool of data collection, the structure of a research proposal , modes of analysis, interpretation and validation.

Course Objectives

- To provide students with descriptive and exploratory skills required in research.
- To help them develop writing skills in relation to research discoveries from different research studies undertaken.
- To provide students with a better analytical perspective on the findings acquired from the field.
- To expose students to the field experiences in attempts to collecting data.

Course content
Introduction

- Definition of research
- Different forms of research
- Distinguish between qualitative and quantitative variables
- Differences between qualitative and quantitative research
- Concepts that relate broadly to both quantitative and qualitative research

Sample Design

- Definition of sampling
- Different types of both random and non-random sampling

Research Design

- Meaning of a research design
- Types of research design i.e descriptive designs, co relational designs, case study designs
- How to design and conduct a case study

Methods of data collection

- Observation method
- Survey
- Group interviews (Focus Group Discussions)
- Questionnaires
- Advantages and disadvantages of each stated method/tool

Planning the survey as a data collection tool

- Hypotheses
- Determine the respondents
- Questionnaire, interview or telephone survey
- Format issues
- Rules for asking good questions
- Analyzing survey data

The structure of a research proposal

- Title
- Table of contents
- An abstract
- Chapter one: Background to the problem
- Chapter two: Literature review
- Chapter three: Methodology
- Chapter four: Results/findings of the study
- Chapter five: Discussion, conclusion and recommendations
- References
- Appendices

Assessment
Coursework 40%
Exams 60%
Total Mark 100%

Introduction

This module generally focuses on the various health research methods used in public health, with these methods various techniques are applied to identify issues. By the end of this module one should be in position to identify the various research methods and explain them efficiently as well as knowing their relevancies

Course work

a) Through proper explanations and illustrations briefly explain ten medical research methods used in public health.

b) What is the importance's of research to the profession of Public health and the health fraternity as a whole

What Are Health Services Research Methods? Why Are They Important?

In the 1960's, the field of health services research was created by combining several study sections at the National Institutes of Health to create the Health Services Research Study Section. The HSR study section sought to define HSR as a distinct field of scientific inquiry at the intersection of public health and medical care, informed by disciplinary perspectives. Since that time, the field has evolved to encompass multiple disciplinary perspectives, including methods from cognate disciplines such as economics, statistics, political science, sociology, and many other schools of thought. The field has also developed new models and techniques to address research questions in specialized areas of inquiry such as patient safety and access to care.

Due to the breadth of the field, two terms are critical to defining the scope of health services research methods. These are: 1) health services research, and 2) methodology.

The Academy Health definition of health services research, developed in 2000 by Kathleen Lohr and Don Steinwachs, is as follows:

Health services research is the multidisciplinary field of scientific investigation that studies how social factors, financing systems, organizational structures and processes, health technologies, and personal behaviours affect access to health care, the quality and cost of health care, and ultimately our health and well-being. Its research domains are individuals, families, organizations, institutions, communities, and populations.

An additional definition of health services research is provided by *Lexikon*:

Research concerned with the organization, financing, administration, effects, and other aspects of health services. Health services research is often concerned with the relationships among need, demand, supply, use, and outcomes of health services. Structure, process, and outcome of health services may be evaluated. Evaluation of structure is concerned with resources, facilities, and manpower; process, with matters, such as where, by whom, and how health care is provided; and outcome, with the results of the services (such as the degree to which individuals receiving health services actually experience measurable benefits).

Methodology is the collection or study of methods (practices, procedures, and rules) used by those who work in a discipline or engage in an inquiry, as in the methodology of measuring, assessing, and improving performance. Methodology addresses the full range of issues confronted by empirical work in health services research, including conceptualization, modelling, literature review, study design, sampling, data collection, measurement, and research ethics.

By combining the definitions above, it is apparent how wide the scope of methods employed by health services researchers is. HSR methods encompass a variety of study frameworks, designs, and analytic techniques. These include a spectrum of methods, from understanding of various epistemological perspectives on research, to study designs including focus groups and randomised controlled trials, to specific analytic techniques such as longitudinal data analysis.

To help organise the array of HSR methods, core and desired resources have been divided into 18 major topic areas, including:

Economics & Cost Effectiveness
Epidemiology
Ethics
Evaluation
Health Services Research Applied Methods
Information Technology
Management Sciences

Medicine
Outcomes Research
Policy
Psychology
Public Health
Qualitative Research
Quality and Safety
Sociology
Statistics, Biostatistics & Econometrics
Survey Research
Trials

Reviewing the topic areas above, it is apparent that HSR methods are not confined to disciplinary methods, but rather, are unique in their approach to medical and health care delivery questions because the field was developed to facilitate study of applied questions. These include:

- Who has access to health care?
- Do patients in large urban areas receive the same level of services as those in rural areas?
- At different levels of care, which patients have the best outcomes?

Many of these types of questions have policy implications. As a result, funding for health services research has often been linked to political interests. Yet, HSR studies are girded by the same methods as many other disciplines. As discussed above, econometric, epidemiological, survey research, and other widely accepted methods form the backbone of HSR.

A related challenge for health services researchers is that the types of questions of interest to the field rely on the ability to generalise from data to the population at large. In order to collect information that may be generalised to the population, it is often necessary to draw associations from existing sources of data such as claims databases or large population surveys - frequently referred to as observational data. Observational data is collected in situations when it would be unethical or impractical to randomize participants to one condition or another - such as having or not having health insurance. Because the data is not randomised, it is not possible to assume that an intervention causes a particular outcome; rather, researchers rely on statistical analyses to draw associations between factors in a study.

Despite concerns about the shortcomings of using non-randomised data in HSR studies, there are major benefits to studying the implications of care delivery or policy at the population level. The scope of HSR studies often allows for greater understanding of an intervention's effectiveness, or effect in a real-world population, as opposed to randomized controlled trials, which are better at assessing efficacy -- the outcome in an ideal, controlled population. In addition, HSR studies have always been closely linked to policy considerations, and as such, have the potential to enhance understanding of health care systems and impact care delivery for large numbers of individuals.

For librarians it is becoming increasingly important to create a collection of materials that address the types of applied questions that health services research addresses. This is a daunting task because of the breadth and depth of the disciplines and subjects encompassed by HSR. As the list of disciplines and topic areas relevant to HSR demonstrates, a wide array of disciplines are included in the health services research methodological 'toolkit'.

Librarians may wish to utilise the module by choosing specific content areas that will benefit their personal library needs. Likewise, faculty developing new courses may look to this list for suggested current textbooks in the field. The organisation of the list is intended to facilitate understanding of the array of options in different disciplines.

This list of resources is not intended to define the full range of HSR methods texts, rather, to provide a set of resources considered valuable by librarians and academics in the field of health services research.

The field of health services research is continually expanding and developing new methods to apply to health care and health care delivery questions. Due to the fact that the field is growing rapidly, we recommend that users of this list search for updated versions of the resources cited here in order to ensure the most recent information on methodological topics.

They are basically two main types of research methods which is quantitative and qualitative, which all the methods lie under

Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications." Thus research is a careful and systematic investigation in some field of knowledge such as culture of people, religion, etc (Neon 1995)

Variable: Variables are properties or characteristics of some event, object, or person that can take on different values or amounts (as opposed to constants which do not vary). When conducting research, experimenters often manipulate variables. For example, an experimenter might compare the effectiveness of four types of antidepressants. In this case, the variable is the "type of antidepressant" I.e. attributes which take on different values from time to time e.g.

- Height
- Weight
- Age etc

The following are the types of variables

1: Independent variable

When a variable is manipulated by an experimenter

2: Dependent variable

The experiment seeks to determine the effect of the independent variable on relief from depression. In this example, relief from depression is called a dependent variable.

In general the independent variable is manipulated by the experimenter and its effects on the dependent variable are measured.

Or

Dependent variable: a variable in a logical or mathematical expression whose value depends on the independent variable; "if f(x) =y, y is the dependent variable"

Consider age with beauty of an individual: beauty deterioration of an individual is caused by advancement in age .Age is an independent variable and beauty is the dependent variable.

3:Extraneous variable; this is the characteristics whose effects are not needed in the study like noise, for the case if one is studying the causes of lack of concentration in a given computer class or any other class.

4: Active variables characteristics that can be manipulated e.g. study environment or teaching methods etc

5; Assigned variables, certain characteristics assigned by nature and can not be changed or manipulated like height, sex of individual, age etc

Qualitative **and Quantitative Variables**

Qualitative variables: These are variables that express a qualitative attribute. Some examples of qualitative variables are hair color, eye color, religion, favorite movie, gender, and so on. The values of a qualitative variable do not imply a numerical ordering. Values of the variable "religion" differ qualitatively; no ordering of religions is implied. Qualitative variables are sometimes referred to as categorical variables. Values on qualitative variables do not imply order, they are simply categories

Quantitative variables: These are variables that are measured in terms of numbers, Some examples of quantitative variables are height, weight, and shoe size.

Discrete and Continuous Variables: *Variables such as number of children in a household are called discrete variable.*

Discrete variables: These are variable with possible scores of discrete points on the scale e.g a household could have three children or six children, but not 4.53 children. Other variables such as "time to respond to a question" are continuous variable

Continuous variable: These are variables where the scale is continuous and not made up of discrete steps e.g. The response time could be 1.64 seconds, or it could be 1.64237123922121 seconds. Of course, the practicalities of measurement preclude most measured variables from being truly continuous.

Random selection: is how you draw the sample of people for your study from a population.

Random assignment is how you assign the sample that you draw to different groups or treatments in your study. It is possible to have both random selection and assignment in a study. Let's say you drew a random sample of 100 clients from a population list of 1000 current clients of your organization. That is random sampling. Now, let's say you randomly assign 50 of these clients to get some new additional treatment and the other 50 to be controls. That's random assignment
.

Concepts that relate broadly to both quantitative and qualitative research

Association:

Sometimes there is a relationship between two variables but the relationship may not be causal i.e., neither variable is dependent upon the other. It may be seen that short men are more assertive than taller men but it does not follow that being short causes men to be assertive and we can not state that being assertive make a man short; there is no causal relationship

Bias:
Distortion of the findings resulting from an undesirable influence.

Causality / Causal relationship:

A relationship in which one action brings about (causes) a particular consequence. More correctly, (since research can only hope to disprove a theory rather than prove it), a relationship in which failure to do 'x' means that 'y' will not follow. E.G., We can be less certain that bathing in the sun for two hours around midday causes skin to burn, than we can know that keeping out of the sun for the two hours around midday is unlikely to cause skin to burn.

Hawthorn Effect:

A psychological response in which subjects alter their behaviour because they are aware of their participation in the study

Piloting:

A small-scale trial of the research method to ensure that the design is feasible, Although only a small number of subjects may be used, a variety of practical questions may be determined. E.g., can the subjects understand the questions they are being asked?

Population:

Literally means "all the people" and in research the term is most commonly used to refer to a specific group of people. However, in a research context, population refers to all the members or objects of any defined group which might be taken or about which information might be given. A research population refers to the entire group to which the research results apply e.g., a relevant age group, or equipment group such as syringes.

Sample:

Refers to the segment of the population that is selected for investigation (the subset of the population)

Sampling frame: it is the listing of all the units in the population from which the sample will be selected

Census: this is a complete enumeration of an entire population

Reliability:

Is concerned with the accuracy (consistency, stability and repeatability) of a measure in representing the true score of the subject being assessed on a particular dimension, the same results must be achieved, as far as possible, regardless of whom is doing the measuring. e.g., several nurses weighing the same patient on the same set of scales, in quick succession, should gain the same results. Reliability of measurement reduces influence or bias on the part of the person(s) doing the measurement, to a minimum.

Representative:

Refers to the extent to which a sample reflects the "truth" for the whole population in the study. The sampling technique should aim to ensure that the views of the population are reflected by the sample.

Validity:

Refers to whether a particular instrument actually measures the construct it is designed to assess. e.g., a cardiac monitor is not a valid tool for measuring the peripheral pulse. A cardiac monitor is a valid tool for measuring the electrical activity of the heart.

Internal validity:

The extent to which the effects detected in a study are a true reflection of what is real, e.g., if the detected effect is that better nutrition leads to greater height gain in infants, internal validity exists if the height gain can not be attributed to another factor. (NB this other factor may be referred to as a confounding or extraneous variable).

External validity:

"The extent to which study findings can be generalised beyond the sample used in the study" (Burns and Grove 1993) e.g., One study may find that better nutrition leads to increased height gain in infants but external validity exists only if this finding is found with other samples.

NB the concept "Variable" appeared on the glossary of the previous session

SAMPLE DESIGN

The way of selecting a sample from a population is known as sample design. It describes various sampling techniques and sample size. It refers to the technique or procedure the researcher would adopt in selecting items for the sample.

Sampling:

Sample; Sampling; method of selecting a certain number of units from a total population

(Macleod Clark J and Hockey L. 1981)

The way a sample is selected should be clearly demonstrated in a research report. The aim of a sample is that it should be as unbiased a cross section of the "parent" population as possible, i.e., a sample of subjects needs to be as representative as possible of the population under study.

To obtain a cross section we need to devise a sampling frame to define the boundaries (limits) within the context of the study and to reflect the organization within which the sampling is taking place.

The larger the size of the sample, the lower is the likelihood of it failing to represent the population under study. However, the law of diminishing returns tells us that there is, for each study, a desirable sample size under which their may fail to be accuracy yet above which there is no better a reflection of the parent population.

Sampling may be

a) Random and non random sampling.
b) Non random: In a nonrandom sample, members are selected on the basis of a particular set of characteristics, rather than a random chance of being included and certainly it introduces bias.

Random- Random sampling is completely based on chance. For example, one might identify all members of a population, (n=250) write their names on separate pieces of paper, and then draw 25 names out of a hat to determine who is actually to be included in the study and every individual has a chance of being included in the study.

Types of random sampling

Systematic

Is a statistical method involving the selection of every k^{th} element from a sampling frame, where k, the sampling interval, is calculated as:

k = population size (N) / sample size (n)

- Stratified
- cluster sampling

Stratified sample

In a stratified sample the sampling frame is divided into non-overlapping groups or strata, e.g. geographical areas, age-groups, genders. A sample is taken from each stratum, and when this sample is a simple random sample it is referred to as stratified random sampling.

Where there is heterogeneity in the population this can be reflected in the strata, i.e., each stratum can be weighed to reflect the heterogeneity. In this way a proportional representation of the whole population can be gained.

Cluster sample

Best used where there is a wide geographical spread. Clusters may be chosen subjectively to be representative of the whole. The clusters can be further stratified. E.G., if we want to know about all A&E patients in the country we need to take a

sample from a variety of A/E's. Each department can bring a number of patients into the sample according to whether they meet the stratification criteria and it is often used in marketing research

Multistage sampling

This is the use of sampling methods that are considerably more complex than these other methods. The most important principle here is that we can combine the simple methods described above in a variety of useful ways that help us address our sampling needs in the most efficient and effective manner possible. When we combine sampling methods, we call this multi-stage sampling.

Concepts strongly associated with quantitative research

Survey:

Involves the study of a large number of subjects drawn from a defined population

Randomisation:

A method for controlling possible extraneous variables involving assigning objects (subjects, treatments etc.,) to a group or condition in such a way that every object has an equal probability of being assigned to any particular condition. Randomisation can also be applied in other settings for research e.g., within a questionnaire there may be a sequence of questions, which, if reordered randomly, may evoke different responses because the previous question does not then influence the current question.

Control:

In order to increase the probability that findings accurately reflect the reality of the situation being studied, the study needs to be designed in such a way as to maximise the amount of control over the research situation and variables. Through control the influence of extraneous variables, variables which are not being studied but which could influence the results of the study by interfering with the action of the ones being studied, is reduced.

Manipulation:

Refers to the fact that we can create artificial divisions and circumstances in order that we can test a particular hypothesis, In experimental research the "causative" variable must be amenable to manipulation by the investigator; i.e., the researcher "does something" to subjects in the experimental condition. Subjects in the control group are not "manipulated" in the way that subjects in the "experimental group" are manipulated.

Treatment Group: The portion of a sample or population that is exposed to a manipulation of the independent variable is known as the treatment group. For example, youth who enroll and participate in recreation programs are the treatment group, and the group to which no recreation services are provided constitutes the control group

Confounding Errors

Errors: are conditions that may confuse the effect of the independent variable with that of some other variable(s).

1. Premeasurement and interaction errors
2. Maturation errors
3. History errors
4. Instrumentation errors
5. Selection bias errors
6. Mortality errors

Measurement (levels)

Nominal: Subjects of research are differentiated by possessing or not possessing a given characteristic, e.g., pass/fail, single/married, and divided into a number of categories but the difference between the categories is not measurable in any real sense. This is the least sophisticated level of measurement.

Ordinal: Subjects are ranked in order from greatest to least or best to worst. Again there is no precisely measurable difference between the ranks.

Interval: Genuinely quantitative measurement such as that of temperature is measured at the interval level of measurement. Here the difference between 10 and 11 degrees centigrade is the same as the difference between 11 and 12degrees centigrade.

Ratio: In a scale of measurement where the difference between points on the scale is precise (as in the measurement of height and weight,) *and the scale starts at zero* the level of measurement is referred to as ratio. Height and weight start at zero. You can not weigh less than 0.00kg and cannot be less than 0.00mm in length/height; these are ratio scales. You can however record temperatures of the weather in terms of minus *x* degrees centigrade and this is why the scale is interval and not ratio.

Research Design

Research design can be thought of as the *structure* of research -- it is the "glue" that holds all of the elements in a research project together or plan for a study that guides the collection and analysis of the data

We often describe a design using a concise notation that enables us to summarize a complex design structure efficiently. What are the "elements" that a design includes?

Types of design:- Experimental design , Quasi-experimental design, Survey design, cross-sectional design, Case studies, comparative study etc

The research design:

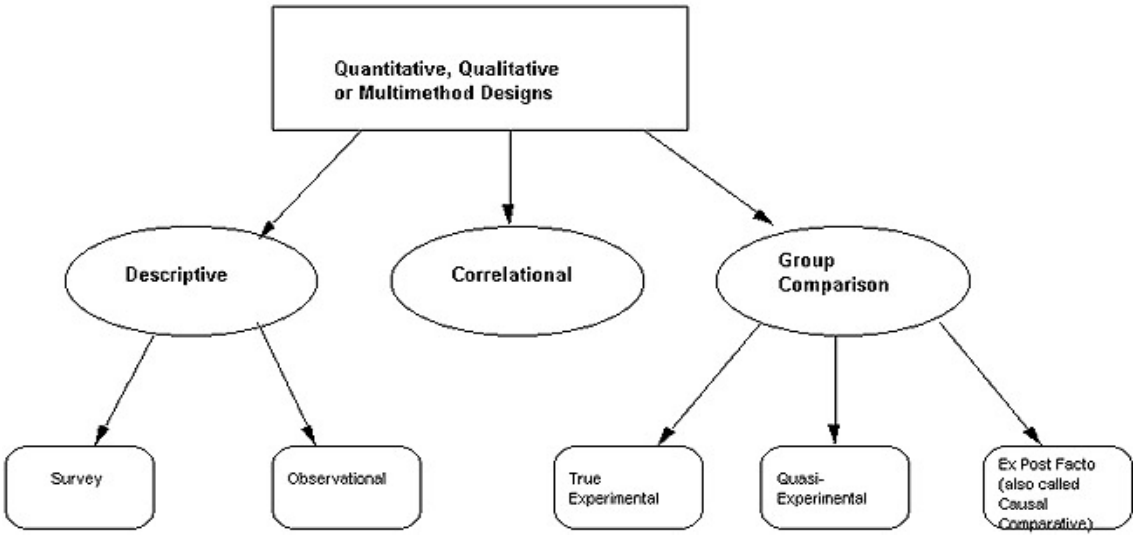
(1) Is driven by there search problem
(2) Depends upon how much is known about the problem

Types of Research Design

For example, if you are doing a study where you will be *rating* students (numerically) on their performance of a sensory-motor skill AND also *interviewing* these students (data in words) to determine how they perceive their own skill levels (if one does that !), *then at least one "design methodology label" that would apply is "multimethod*."

Now, some design labels apply only to qualitative studies -- while others could apply to a study that's any of the of designs. We'll look at the qualitative labels in a future follow-up lesson. For now, let's look at the possibility: families of design methodology labels that could apply to any/all of the above 3 possibilities.

Figure 2.



Design Methodology
That Correspond To Quant/ Qual/ Multi method Studies

Most of these, as we'll see, "link" to certain "keywords" in the research question or problem statement!

I. **Descriptive Designs**

Example: This study is to *identify* the perceived barriers to successful implementation of the Career Ladder Teacher Incentive & Development Program in X School District.

"Identify"/"what is - what are" (the perceived barriers) - > Descriptive problem statement AND also descriptive research design methodology!

Two "sub-types" (add'l. design methodology labels that could apply to "descriptive designs):"

Survey - This label also applies to any study in which data or responses (be they quant/qual/both) are recorded via any form of what we think of as "survey instrumentation."

You've probably seen (more than you care to think about! if you've been 'approached' by a 'needy dissertation stage doctoral student' to participate in his/her study!) such surveys. They can take many forms:

A. Check-off items (e.g., gender, position);
B. Fill-in-the-blank items;
C. Likert-type scales (e.g., on a 5-point scale, say, from "strongly disagree" to "strongly agree," you're asked to circle or check your opinion regarding a statement such as, "The Career Ladder Teacher Incentive and Development Program provides ample opportunity for teacher advancement in my district")
D. Open-ended fill-in items (you're asked to give a response in your own words, using the back of the survey sheet or extra paper if necessary; something like "Please state the three main reasons you chose to apply for the Career Ladder Teacher Incentive and Development Program this year.")

Types of Survey Research

While often these surveys are paper-&-pencil in nature (e.g., you're handed one or receive it in the mail & asked to fill it out and return it to the researcher), they are

sometimes "administered" orally in a face-to-face or telephone interview (e.g., the researcher records your answers him/herself).

Some Guidelines for Interviews

There are other variations on survey-type questions; the above are just examples of the most common forms and scaling of such responses.

If the responses to our earlier example were collected in the form of a survey -- be it, say, Likert-scaled attitudinal items and/or open-ended questions where the teachers are asked to share the perceived barriers in their own words -- then the study would be characterized as a *descriptive survey design methodology*.

E. **Observational** - In these design methodologies, instead of administering a survey instrument, the researcher collects data by observing/tallying/recording the occurrence or incidence of some outcome -- perhaps with the aid of assistants.

He/she might want to identify the most frequently occurring type(s) of disruptive behavior in a particular classroom. With clear prior agreement on what constitutes such "disruptive behavior" (operational definitions of our variables are important, remember?! It becomes an issue of "reliability," or verifiability that "we saw what we saw" vs. "our own bias" of what constitutes this disruptive behavior!), the researcher could develop a listing of such behaviors and observe and record the number of times each one occured in a particular observation session in a classroom. (Again, he/she might wish to 'compare notes' with assistants in order to enhance reliability or verifiability -- e.g., as a cross-check for accuracy).

This type of research would warrant the design methodology label of not only "descriptive" (due to the 'identify/what is - what are [the most frequently occurring ...]?') but also "observational" due to the recording/tallying protocol.

(By the way, qualitative-type observations can also be recorded. They don't have to be strictly numeric tallies. Examples that come to mind include case notes of counselors, where they record their perceptions in words.)

II. Correlational Designs

We've seen these too! Just as in the case of "descriptive" designs, these "link" to the keywords of "association," "relationship," and/or "predictive ability" that we've come to associate with "correlational" research questions or problem statements!

Correlational Research

III. Group Comparisons

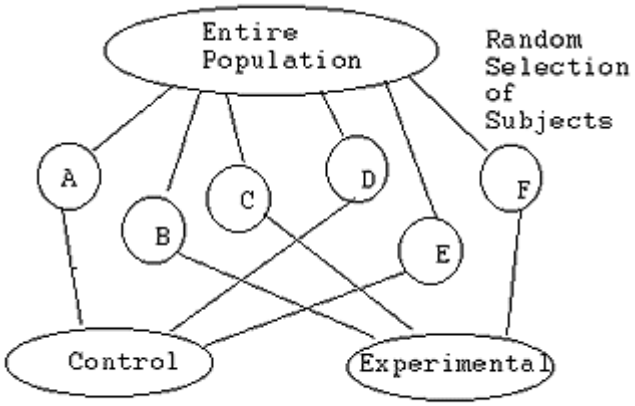
We've briefly talked about "experiments" generally, in terms of "key features" such as the following:

a. **tight control** (the researcher attempts to identify in advance as many possible 'contaminating' and/or confounding variables as possible and to control for them in his/her design -- by, say, building them in and balancing on them -- equal numbers of boys and girls to 'control for gender' -- or 'randomizing them away' by drawing a random sample of subjects and thereby 'getting a good mix' on them -- e.g., all levels of 'socioeconomic status')
b. because of the preceding control, the 'confidence' to **make 'cause/effect statements'**

That is, we begin to get the idea of ***2 or more groups, as balanced and equivalent as possible on all but one "thing:" our "treatment"*** (e.g., type of lesson, type of counseling). ***We measure them before and after this treatment and if we do find a difference in the group that 'got the treatment,' we hope to attribute that difference to the treatment only*** (because of this tight control, randomization, and so forth).

Now ... there are actually two "sub-types" of experimental designs. Plainly put, they have to do with how much 'control' or 'power' you as the researcher have to do the above randomization and grouping!

A. **True experimental** - If you can BOTH randomly draw (select) individuals for your study AND then randomly assign these individuals to 2 or more groups (e.g., 'you have the power to make the groups' yourself!), then you have what is known as a true experiment.'



Random Assignment of Subjects to Experimenter-Formed Groups

In the preceding scenario, the researcher first:

1. Randomly selected subjects A through F from the larger population; AND
2. Then randomly assigned these individuals to (experimenter-formed) groups. In our example, by coin-flipping or some other random procedure, Subjects A, D & E "landed" in the control group (e.g., the class that will get the traditional lecture), while Subjects B, C, & F "landed" in the experimental or treatment group (e.g., the researcher-formed class that will get the hands-on science instruction, say).

The two levels of "randomization" help to ensure good control of those pesky contaminating or confounding variables, don't they?! You're more likely to get a "good mix" on all those other factors when you can randomly draw your subjects and also randomly assign them to groups that you as the researcher have the "power" to form!

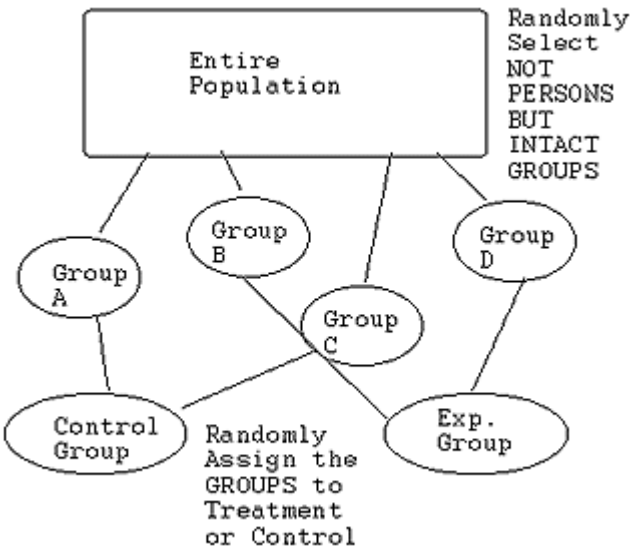
Ah...but ivory-tower research is one thing; real life quite another !

What if you get the OK to do your research within a school district, but the sup't. says, "Oh no! I can't let you be disrupting our bureaucratic organization here and "making your own 4th grade classrooms" for your study! That's way too disruptive! No, no, the best you can do is to randomly select INTACT existing 4th grade classrooms and then go ahead and use all the kids in those randomly drawn GROUPS instead!"

The True Experiment and Quasi-Experiment

Which brings us to the 2nd variant of "experimental designs:"

B. **Quasi-experimental - what you are 'randomly drawing' (selecting) is NOT INDIVIDUALS but INTACT (pre-existing) GROUPS**! These could be existing classrooms, clinics, vocational education centers, etc. In other words, you "lose" the power to "make your own groups" for your study!



Here (for the quasi-experiment), you randomly draw intact groups (e.g., from all the 4th grades in the district, you draw 4 of them at random) and then flip a coin or use some other random procedure to assign the pre-existing 4th grades to either the "treatment" or "control" conditions. (In our example Grades A and C "land" in the traditional lecture method (control), while Grades B and D end up in the hands-on science instruction (e.g., the "treatment" or the "experimental" group).

Do you see how this is different from the "true" experiment? In the "true" experiment, you selected the children themselves (subjects) at random and then "had the power" to in essence "form" your own "4th grades" by assigning the individual kids themselves randomly to either the control or the experimental conditions.

Here, though, the 'best you can do' (again, often for practical reasons such as access to sites, permission, etc.) is draw not individual kids but the GROUPS themselves (pre-existing 4th grade classrooms) at random and then in step # 2 assigning NOT the INDIVIDUAL KIDS but rather the WHOLE GROUPS to either the treatment or control conditions.

Quasi-Experimental Design

See how ***this one-step loss of randomization may mean a bit less control over those pesky contaminants***?! By forming your own groups you have a greater likelihood of "getting a good mix on all other stuff". But here, you've got to "live with the existing groups as is." And suppose that in the above scenario, 4th Grades B & D also happen (quite by accident, but welcome to 'real life!') to have a higher average I.Q. of 15 points than A & B! Now we've got a contaminant! Did the kids do better because of the hands-on science lesson -- or because of their inherently higher aptitude, intelligence or whatever?!

But at least we still have that last step: random assignment to either the experimental or control conditions!

Remember ... again...

1. For true experiments, we're randomly assigning individuals to treatment vs. control; and
2. For quasi-experiments, we're randomly assigning intact/pre-existing groups to treatment vs. control.

Well -- we lose that "random assignment" property in the 3rd "family" of group comparison design methodologies!

Ex post facto (also called "causal comparative") - really no 'random anything!' We identify some sort of outcome and wonder 'what makes it vary like that?' Could it be some pre-existing grouping? For instance, if we 'divided' or 'pile-sorted' the responses by gender, would that account for the difference we see?

Thus, there is no treatment either! Simply an attempt to see if a grouping that we had no prior control over seems to "make a difference" on some outcome(s)!

The keyword "difference" (by grouping) and no treatment would be the tip-off to an ex post facto or causal-comparative study design.

And -- regarding the grouping -- maybe this rather silly example will make the point! And help you to identify if you are in such a situation of "no-control-over-grouping:"

You wish to study whether preschoolers from single-parent homes are different in terms of emotional readiness for kindergarten than those of two-parent homes.

Now ... you couldn't go to prospective subjects' homes and say, "OK, now you've got to get divorced ... and YOU have to stay married ... 'cuz that's how you came up in the random assignment!"

I don't think so...!!! Same thing with "gender:" you took it "as is" (e.g., those subjects in essence 'self-selected into their gender grouping). You had no prior control over 'making' them 'be' one gender or the other but rather took those groups 'as is' and kind of pile-sorted some response(s) by gender to see if it 'made a difference' on some outcome! Indeed ... the ***literal Latin translation of "ex post facto" is "after the fact."*** This shows YOUR role in the 'grouping' process as the researcher! You didn't 'assign' them into any one group, randomly or otherwise. Instead, you came in "after the fact" and wished to see if that self-determined grouping made a difference on some outcome(s) that you are studying!

As you can imagine -- even bigger problems with contaminating variables! There is no randomization or control here!

Thus the name "causal comparative" is sort of a misnomer. You are indeed "comparing" two or more "pre-formed" groups on some outcome(s). But due to that *lack of randomization and control*, you can't really use this design to study "cause/effect" types of research questions or problem statements. There are generally *too many uncontrolled, unrandomized contaminating variables* that may have entered the picture to confidently make 'strong' cause/effect statements!

Nonetheless, given the circumstances, this type of design might be "the best you can do." Group differences on some outcome(s) might indeed be interesting to study even though you had little or no "control" in the situation.

To summarize, for the "group comparison" family of designs:

Kind of Study	**Method of Forming Groups**
Ex Post Facto (Causal Comparative)	Groups Formed
True Experiment	Random Assignment of Individual to "Researchr-Made" Groups
Quazi-Experiment	Random Assignment of Intact Groups

Case study design

It is a useful tool for investigating trends and specific situations in many scientific disciplines, especially social science, psychology, anthropology and ecology

Basically, a case study is an in depth study of a particular situation rather than a sweeping statistical survey. It is a method used to narrow down a very broad field of research into one easily researchable topic

Though it does not answer a question completely, it gives some indications and allows further elaboration and hypothesis creation on a subject.

The case study research design is also useful for testing whether scientific theories and models actually work in the real world. You may come out with a great computer model for describing how the ecosystem of a rock pool works but it is only by trying it out on a real life pool that you can see if it is a realistic simulation.

For psychologists, anthropologists and social scientists they have been regarded as a valid method of research for many years. Scientists are sometimes guilty of becoming bogged down in the general picture and it is sometimes important to understand specific cases and ensure a more holistic approach to research.

Its advantage, (case study research design) is that you can focus on specific and interesting cases. This may be an attempt to test a theory with a typical case or it can be a specific topic that is of interest. Research should be thorough and note taking should be meticulous and systematic. In a case study, you are deliberately trying to isolate a small study group, one individual case or one particular population.

For example, statistical analysis may have shown that birthrates in African countries are increasing. A case study on one or two specific countries becomes a powerful and focused tool for determining the social and economic pressures driving this

How To Design And Conduct A Case Study

It is best if you make yourself a short list of 4 or 5 bullet points that you are going to try and address during the study. If you make sure that all research refers back to these then you will not be far wrong.

With a case study, even more than a questionnaire or survey, it is important to be passive in your research. You are much more of an observer than an experimenter and you must remember that, even in a multi-subject case, each case must be treated individually and then cross case conclusions can be drawn

How To Analyze The Results

Analyzing results for a case study tends to be more opinion based than statistical methods. The usual idea is to try and collate your data into a manageable from and construct a narrative around it.

Use examples in your narrative whilst keeping things concise and interesting. It is useful to show some numerical data but remember that you are only trying to judge trends and not analyze every last piece of data. Constantly refer back to your bullet points so that you do not lose focus.

It is always a good idea to assume that a person reading your research may not possess a lot of knowledge of the subject so try to write accordingly.

In addition, unlike a scientific study which deals **with facts,** a case study is based on **opinion** and is very much designed to provoke reasoned debate. There really is no right or wrong answer in a case study.

Cross-sectional design

A research design where **subjects are assessed at a single time** in their lives, A cross sectional study is fast and can study a large number of patients at little cost or effort. Also, you don't have to worry about patients dropping out during the course of the study. This study is efficient at identifying association, but may have trouble deciding cause and effect. With data at only one time point, you don't know whether the chicken or the egg came first. Here are two examples of cross sectional designs
In Zureik et al (BMJ 2002 Aug 24;325(7361):411), a group of 1132 adults with asthma were given respiratory function tests to assess the severity of their asthma. They were also given skin prick tests to assess their sensitization to mold, pollen, dust mites, and cats. In this study, those patients with reactions to mold were much more likely to have severe asthma.

Types Of Research

Research can also be classified on the basis of its purpose its intended to achieve and examples of such researches include:

Evaluative research:

This is the study that focuses on whether an intervention was properly implemented and whether the intended outcomes of a given programme or project have been realized or not. (Mouton, 2001) Evaluation studies are both quantitative and qualitative in nature and it requires an understanding of the project objectives so that the performance of the project can be measured against the set objectives.

Predictive research

This type of research takes on several variables and tries to predict the likely outcome. It asks ‘what if questions. Thus it is based on predictions which themselves grow out of repeated actions and events which have been studied. It is based on probability and can be used to predict the likelihood of an event occurring (Wisker, 2001)

Historical research

These are studies which attempt to reconstruct the past and chronology of events (mouton 2001) and aim at arriving at an accurate account of the past so as to gain a better understanding of the present and fore cast what the future is likely to be.

Historical research is also referred to as analytical research. Common methodological characteristics include a research topic that addresses past events, review of primary and secondary data, techniques of criticism for historical searches and evaluation of the information, and synthesis and explanation of findings. Historical studies attempt to provide information and understanding of past historical, legal, and policy

Meta-Analysis

Meta-analysis combines the results of studies being reviewed. It utilizes statistical techniques to estimate the strength of a given set of findings across many different studies. This allows the creation of a context from which future research can emerge and determine the reliability of a finding by examining results from many different studies. Researchers analyze the methods used in previous studies, and collectively quantify the findings of the studies. Meta-analysis findings form a basis for establishing new theories, models and concepts.

Thomas and Nelson (1990) detail the steps to meta-analysis:

1. Identification of the research problem.
2. Conduct of a literature review of identified studies to determine inclusion or exclusion.
3. A careful reading and evaluation to identify and code important study characteristics.
4. Calculation of effect size. Effect size is the mean of the experimental group minus the mean of the control group, divided by the standard deviation of the control group. The notion is to calculate the effect size across a number of studies to determine the relevance of the test, treatment, or method.
5. Reporting of the findings and conclusions.

Exploratory research:

These are studies intended to carry out preliminary investigation into relatively unknown areas of research (Terre Blanch and Durrheim). They employ open, flexible and inductive approach to research as they attempt to look for new insights into phenomena. They generate speculative insights, new questions and hypothesis. They ask both 'what and why 'questions (Wiker, 2001, and Mbaaga, 1990) and this type of research is more flexible.

Descriptive research

Descriptive reseach are designed to gain more information about a particular characteristic within a particular field of study. A descriptive study may be used to, develop theory, identify problems with current practice, justify current practice, make judgements or identify what others in similar situations may be doing. There is no manipulation of variables and no attempt to establish causality. They are qualitative in nature and produce descriptive data i.e they use people's own written and spoken words as well as observable behaviour to describe a phenomenon or event so that it can be understood better.

- Descriptive research requires the clear specification of...
  WHO, ***WHAT***, ***WHEN***, ***WHERE***, ***WHY***, and ***HOW***

-- Before data collection can begin

- Exploratory research is very flexible; descriptive research is **MUCH** more rigid

Causal research

This is a type of research that tries to find out the cause and effect of phenomenon (Leedy, 1997). The possibility of causal inference derives from the use of randomization techniques, experimental and comparative groups and repeated measures over time. Thus it aims at establishing cause-effect relationships between the research variables.

Other classification of research

It may also be categorized into the following

- Quantitative versus qualitative research
- Basic versus applied research
- Empirical and non empirical research

Qualitative and Quantitative Research

Quantitative research is:
"a formal, objective, systematic process in which numerical data are utilized to obtain information about the world" (Burns and Grove cited by Cormack 1991 p 140). There is massive use of mathematics, statistical tools and the samples are comparatively large.
In general, qualitative research generates rich, detailed and valid (process) data that contribute to in-depth understanding of the context. Quantitative research generates reliable population based and gereralizable data and is well suited to establishing cause-and-effect relationships

Quantitative research is research involving the use of structured questions where the response options have been predetermined and a large number of respondents is involved.
By definition, measurement must be objective, quantitative and statistically valid. Simply put, it's about numbers, objective hard data.

The sample size for a survey is calculated by statisticians using formulas to determine how large a sample size will be needed from a given population in order to achieve findings with an acceptable degree of accuracy. Generally, researchers seek sample sizes which yield findings with at least 95% confidence interval (which means that if you repeat the survey 100 times, 95 times out of a hundred, you would get the same response) and plus/minus 5 percentage points margin error. Many surveys are designed to produce smaller margin of error.

Qualitative Research is collecting, analyzing, and interpreting data by observing what people do and say. Whereas, quantitative research refers to counts and measures of things, qualitative research refers to the meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions of things.

Qualitative research is much more subjective than quantitative research and uses very different methods of collecting information, mainly individual, in-depth interviews and focus groups. The nature of this type of research is exploratory and open-ended. Small numbers of people are interviewed in-depth and/or a relatively small number of focus groups are conducted.

Participants are asked to respond to general questions and the interviewer or group moderator probes and explores their responses to identify and define people's perceptions, opinions and feelings about the topic or idea being discussed and to determine the degree of agreement that exists in the group. The quality of the finding from qualitative research is directly dependent upon the skills, experience and sensitive of the interviewer or group moderator.

This type of research is often less costly than surveys and is extremely effective in acquiring information about people's communications needs and their responses to and views about specific communications.

Basically, quantitative research is objective; qualitative is subjective. Quantitative research seeks explanatory laws; qualitative research aims at in-depth description. Qualitative research measures what it assumes to be a static reality in hopes of developing universal laws. Qualitative research is an exploration of what is assumed to be a dynamic reality. It does not claim that what is discovered in the process is universal, and thus, replicable. Common differences usually cited between these types of research include.

Characteristics of quantitative and qualitative research

Quantitative	**Qualitative**
Objective	Subjective
Research questions: How many? Strength of association?	Research questions: What? Why?
"Hard" science	"Soft" science
Literature review must be done early in study	Literature review may be done as study progresses or afterwards
Test theory	Develops theory
One reality: focus is concise and narrow	Multiple realities: focus is complex and broad
Facts are value-free and unbiased	Facts are value-laden and biased
Reduction, control, precision	Discovery, description, understanding, shared interpretation
Measurable	Interpretive
Mechanistic: parts equal the whole	Organismic: whole is greater than the parts
Report statistical analysis. Basic element of analysis is numbers	Report rich narrative, individual; interpretation. Basic element of analysis is words/ideas.
Researcher is separate	Researcher is part of process
Subjects	Participants

Context free	Context dependent
Hypothesis	Research questions
Reasoning is logistic and deductive	Reasoning is dialectic and inductive
Establishes relationships, causation	Describes meaning, discovery
Uses instruments	Uses communications and observation
Strives for generalization Generalizations leading to prediction, explanation, and understanding	Strives for uniqueness Patterns and theories developed for understanding
Highly controlled setting: experimental setting (outcome oriented)	Flexible approach: natural setting (process oriented)
Sample size: n	Sample size is not a concern; seeks "informal rich" sample
"Counts the beans"	Provides information as to "which beans are worth counting"

The decision of whether to choose a quantitative or a qualitative design is a philosophical question. Which methods to choose will depend on the nature of the project, the type of information needed the context of the study and the availability of recourses (time, money, and human).
It is important to keep in mind that these are two different philosophers, not necessarily polar opposites. In fact, elements of both designs can be used together in mixed-methods studies. Combining of qualitative and quantitative research is becoming more and more common.

Every method is different line of sight directed toward the same point, observing social and symbolic reality. The use of multiple lines of sight is called triangulation.
It is a combination of two types of research. It is also called pluralistic research.
Advantages of combining both types of research include:

1. research development (one approach is used to inform the other, such as using qualitative research to develop an instrument to be used in quantitative research)
2. Increased validity (confirmation of results by means of different data sources)
3. Complementarity (adding information, i.e. words to numbers and vice versa)
4. Creating new lines of thinking by the emergence of fresh perspectives and contradictions.

Barriers to integration include philosophical differences, cost, inadequate training and publication bias.

Qualitative data analysis

Qualitative analysis involves a continual interplay between theory and analysis. In analyzing qualitative data, we seek to discover patterns such as changes over time or possible causal links between variables.
Examples of approaches to discovery and explanations of such patterns are Grounded Theory Method (GTM), semiotics, and conversation analysis.
Qualitative researchers sometimes attempt to establish theories on a purely inductive basis. This approach begins with observations rather than hypothesis and seeks to discover patterns and develop theories.

Qualitative data Processing

The processing of qualitative data is as much art as science. Three key tools for preparing data for analysis *are coding, memoing*, and *concept mapping.*
Coding is classifying or categorizing individual pieces of data.
If you are testing hypothesis, then the codes could be suggested by the theory, in forms of variables. Open coding – codes are suggested by the researcher‘s examination and questioning of the data.
Example: 2 passages from Book Leviticus (Revised Standard version): religious bases for homophobia.
18:22 You shall not lie with male as with a woman, it is an abomination.
20:13 If a man lies with a male as with a woman, both of them have committed an abomination; they shall be put to death, their blood is upon them.
Homosexuality – key concept
Lying implies having sex
Male homosexuality
Prohibited behavior
Abomination
Put to Death
Male homosexuality is not the only abomination. Most of the abominations have to do with dietary rules and mishandling of ritual artifacts. **Thus, Dietary Rules and Ritual Artifacts are additional codes**.

Death penalty is broadly applied by Leviticus: everything from swearing to murder, including male homosexuality somewhere in between.
An extended analysis of prohibited behavior, short of abomination and death, and also turns up a lengthy list. Among them are slander, cursing the deaf, putting stumbling blocks in front of the blind people, and so forth.
Memoing writing memos or notes to yourself and others involved in the project.It is appropriate at several stages of data processing to capture code meaning, theoretical ideas, preliminary conclusions, and other thoughts that will be useful during analysis.
Concept mapping uses diagrams to explore relationships in the data graphically

Basic Research And Applied

Basic Research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.

Applied research is also an original investigation undertaken to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

Experimental development is systematic work, drawing on existing knowledge gained from research and/or practical experience that is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed."

Content In The Proposal

What follows is more information about what is required in the various sections of your evolving research proposal.

I. **The Problem**. You should begin by stating what the problem is that you are going to research. You should give the reader an idea of the project you intend to undertake.

II. **Importance to the Discipline**. Not every topic is worth researching. What should guide your choice of a topic is that it is important and relevant to the field in which you are engaged. You must convince the reader that your topic is important. It is here that you need to integrate some theory that supports the need to investigate your topic.

III. **Literature Review**. Your review should follow the introduction of the problem and should include a logically organized review of the relevant literature. You should give a summary of the theory that guides your work, as well as discuss what others have found who have done the same or similar research. If you are proposing to replicate someone else's work, you should say why. For example, do you wish to extend the generalizability of their findings, or are you hoping to improve on their methodology? Tell why. There is no need for you to rediscover the wheel; therefore, be careful in your search of the literature.

List Questions/Hypotheses. Your review of the literature should lead you to your research questions. In other words, these questions should be a natural outgrowth of your review of others' work. State these questions concisely. Be clear about what you are going to try to prove or disprove. If the reader cannot understand what you are proposing, then you are not making a strong argument

Hypothesis: A statement that specifies how two or more measurable variables are related. e.g

(H1): Women are more likely than men to make impulse purchases of our brand.
(H2): Decreasing price by 10% will increase unit sales by 30%.
(H3): Adoption of our new product will be greater in Northern states than in Southern States.

IV. **Method of Research**. While there are various methods by which one can approach social research, there are certain parameters which must be taken into consideration and addressed in your proposal. If the parameter does not appear to be relevant to your proposed research, you must address why that may be the case. What follows below is a list of parameters which might be considered in the writing

of a research proposal. During the course of the semester, we will address these and other components of a research proposal.

A. **Operationalization of the Variables**: If your question is “Is job security related to job satisfaction?” you must tell what you mean by both job security and job satisfaction, and be very specific. Will these concepts be measures by a response to a question? What is that specific question? If you are asking more than one question to capture a concept, will you form a scale measure? What kind of scale measure? Each variable must have specific operations (hence, operationalization) attached to is so that the reader knows exactly how the variable will be measured in the proposed research.

B. **Design**: Specify what research design your study will take, and why. Is it an experimental design? Will you look at one group once or on several different occasions? Will you look at more than one group? Will you
be comparing different groups? Why? Will you use a case study approach?

C**. Sample**: How will you draw your sample? What is the method(s) you will employ? How many will be in your sample? Why? Will you use probability sampling or non-probability sampling? Why?

D. **Data Gathering Method**: How will you actually gather the data that measures your variables? Will you use a survey? Will you interview people? you use existing data? Which data? If you are using specific instruments,include copies of them in an appendix to the proposal. Will you use focus groups?

E. **Ethical Considerations**: What impact might your study have on your “subjects?” What risk, if any, might you impose on the population you study by conducting the research? What are some different ways in which
the findings of your research might be utilized by others? Are there any possible political uses and what might be some implications of those uses? How your findings might be utilized differently from your research intentions?

F. **Political Considerations** : To what political ends might the findings of your research be used? It is important to be aware that one’s findings,regardless of what was hypothesized, can be put to political use. If the costs of political use outweigh the benefits of the research (which is also true of ethical considerations), one must question whether to conduct the proposed research

G. **Validity and Reliability**: How will you know if you are measuring what you say you are measuring? How will you know if your data is valid? What checks for validity will you provide? Are your measuring tools reliable? How will you know if they are reliable? What will you do that will convince the reader that you have addressed validity and reliability?

H**. Limitations to the Proposed Study**: You should tell the reader some of the limitations you foresee for your study. If you are using a specific sample and this limits generalizability, you should say so. If you are testing a group that might change the effectiveness of your measuring instrument, you need to address it.

Anything that might limit the knowledge gained,in any way, should be mentioned. None of us cond uct the perfect research project; therefore, it is important the we address possible limitations.

V**. Data Analysis**: How do you propose to analyze the data you would collect from this proposed research? If you posit a relationship between some of the variables, how will you determine if there really is a relationship? What statistical techniques might you use? While you are not actually going to do any statistical analysis at this point, you must have an idea of what types of analyses would be appropriate for both your variables and your research questions.

VI. **Reference List**: Any of the studies you cite in the literature review, or any other relevant works that you use in the proposal, must be included in a proper reference list. (See Writing Guidelines) Note that a reference list should include only those items actually referenced in the body of the paper. If you do not use it in the body of the paper, you should not include it inthe reference list.

VII. **Appendices:** You should attach a copy of any relevant supplemental materials, such as questionnaires, interview schedules, scoring keys (code sheets),.

Grading Points for Proposal Papers
Consider the following criteria used in grading to increase your skills in project proposal writing

GRADING: Stage 1 is worth 120 points. Stage 2 is worth 280 points and the next pages detail the grading criteria for each paper.

RESEARCH PROPOSAL –
STAGE 1 – EVALUATION SHEET
MECHANICS (10%) – 12 POINTS
1. Grammatical and spelling errors (possible 8 points): Average number of errors per page: 0 = 8 pts;
1 = 6 pts;
2-3 = 4 pts;
4-5 = 2 pts;
6-7 = 1 pts;
8 or more = 0 pts. _____

2. Follows required writing guidelines, including spacing, margins, and citation of sources. (4 points) _____

ORGANIZATION (30%) – 36 POINTS
1. Presents critical thought on the topic; i.e., does not merely provide Descriptions or lists. (12 points) _____
2. Shows evidence of careful, logical planning and presentation, with use of appropriate headings throughout proposal. (12 points) _____
3. Shows evidence of careful writing, with clear articulate use of language. (12 points) _____

CONTENT (60%) – 72 POINTS

1. Statement of the problem that clearly describes the topic that is being proposed for research. (10 points) _____
2. Demonstrates the importance of the topic for research and for the respective discipline. (10 points) _____
3. Integrates scholarly material and own ideas in the development and discussion of the topic. (25 points) _____
4. Uses scholarly references and shows a clear link to the existing professional literature and relevant theory. (12 points) _____
5. Poses appropriate and clear research questions/hypotheses. (15 pts

The following are the methods of data collection

Observation method

Observational research is used for studying nonverbal behaviors (gestures, activities, social groupings, etc).

Sommer & Sommer (1986) developed the list shown below to assist in observation research.

1. Specify the question(s) of interest (reason for doing the study).
2. Are the observational categories clearly described? What is being observed and why?
3. Design the measurement instruments (checklists, categories, coding systems, etc.).
4. Is the study designed so that it will be 'Valid (i.e., does it measure what it is supposed to measure, and does it have some generalizability)?
5. Train observers in the use of the instruments and how to conduct observational research.
6. Do a pilot test to (a) test the actual observation procedure and (b) check the reliability of the categories of observation using at least two independent observers.
7. Revise the procedure and instruments in light of the pilot test results. If substantial changes are made to the instrument, run another pilot test to make sure changes will work under the field conditions.
8. Collect, compile, and analyze the data and interpret results.

Casual observation is normally done like unstructured interviews. During the early stages of a research project, casual observation allows the researcher(s) to observe subjects prior to designing questionnaires and/or interview formats.

Types of Observation Studies

Ethnographies which are observations of groups

Grounded theory which uses multi-staged data collection Phenomenological studies which studying subjects over a period of time through developing relationships with them and reporting findings based on research “experiences”.

Case studies which use various data to investigate the subject over time and by activity

Each research method has its strengths and weaknesses. When designing a research study it is important to decide what the outcome (data) the study will produce then select the best methodology to produce that desired information.

SURVEY: This is the method used to describe a method of gathering information from a sample of individuals in a population in order to learn something about the larger population from which the sample is drawn.

Types of surveys: descriptive statistics which is largely conducted by the government to obtain major descriptive information about the population and its density, the composition of the labor force, national health statistics etc.

Survey for social research: mainly used by social scientists to gather and a analyze information about the social and economic conditions of the population or segments of the population and leads to the better understanding of human beings in their social settings.

Market research survey: this is carried on by business in consumer market research to determine consumer needs and the effectiveness of marketing programs.

The Steps In A Survey Project

1. Establish the goals of the project or what you want to learn
2. Determine your sample –whom you will interview
3. Choose interviewing methodology-how you will interview
4. Create your questionnaire –what you ask
5. Pretest the questionnaire, if practical test the questions
6. conduct interviews and enter data
7. Analyse the data and produce the report

Interviews; this may be defined as a deliberate conversation between the interviewer and an informant conducted for the purpose of collecting information. It may take the form of face to face interview schedule or telephone survey by Mbaaga (Ibid.). it may be formal or informal interview

Formal interview: this type involves the pre determined list of questions that are asked to all the interviewees in the same order. They may be structured with standardized questions or semi-structured with some degree of flexibility and the more structured the interview, the easier it is to quantify the results.

Group Interview: (Focus Group Discussion) FGD

Richard Krueger (1988), describe the focus group as a special type of group in terms of purpose, size, composition, and procedures. A focus group is typically composed of seven to twelve participants who are unfamiliar with each other and conducted by a trained interviewer. These participants are selected because they have certain characteristics in common that relate to the topic of the focus group.

The researcher creates a permissive environment in the focus group that nurtures different perceptions and points of view, without pressuring participants to vote, plan, or reach consensus. The group discussion is conducted several times with similar types of participants to identify trends and patterns in perceptions. Careful and systematic analyses of the discussions provide clues and insights as to how a product, service, or opportunity is perceived.

A focus group can be defined as a carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non threatening environment. It is conducted with approximately seven to twelve people by a skilled interviewer. The discussion is relaxed, comfortable, and often enjoyable for participants as they share their ideas and perceptions. Group members influence each other by responding to ideas and comments in the discussion.

Characteristics Of Focus Groups

Focus group interviews typically have four characteristics:

1. Identify the target market (people who possess certain characteristics);
2. Provide a short introduction and background on the issue to be discussed;
3. Have focus group members write their responses to the issue(s);
4. Facilitate group discussion;
5. Provide a summary of the focus group issues at the end of the meeting.

Other types of group processes used in human services (delphic, nominal, planning, therapeutic, sensitivity, or advisory) may have one or more of these features, but not in the same combination as those of focus group interviews.

Key Data Collection Techniques

Face to Face or personal interviews
Telephone interviews
Mail / postal interviews
E-mail interviews
Internet/ intranet (WEB PAGE)
How ever the above techniques may have advantages and disadvantages

The above techniques may be applied using a questionnaire,

Questionnaire: Is a predetermined written list of questions, which may be answered, by a subject or respondent.

The type of population, the nature of the research question and resources available determines the type of questionnaire to be used.

Planning the Survey

I. Hypotheses

- Descriptive hypotheses best answered by this method
- If you don't consider your hypotheses before writing your survey, you may be Overwhelmed with data and End up with data that doesn't address your concerns
- Good to go through several different scenarios of outcome from survey to see whether different outcomes would indeed have different implications for: Your

hypotheses and What action you will take (if survey is to address applied issue)

II. After determining precisely what you want to find out, determine who you want to ask

A. Defining your population
B. Determining whether to use the population or to sample
C. Types of samples
1. Convenience samples
2. Quota samples
3. Random samples: Allow you to use inferential statistics to determine how closely your results reflect their population
4. Stratified random samples: The advantage of random samples, but with a smaller sample and/or greater accuracy

III. Questionnaire, Interview, or Telephone Survey?

A. Issues to consider
1. Cost
2. Response rate
3. Honesty of responses
4. Standardization
B. The case for the telephone survey

IV. Format issues:

A. Format of questions
1. Dichotomous versus continuous
2. Fixed versus open-ended

B. Format of survey
1. Structured
2. Semi-structured
3. Unstructured

C. Why a novice might be better off with fixed alternative questions and a structured survey:
1. Data is easily coded
2. Structure may reduce investigator bias: Data on hypothesis-confirming bias (Snyder, 1984, Snyder, 1981, Snyder and Cantor, 1979)

V. Rules for asking good questions

A. Use words a third-grader would understand
B. Use words that won't be misinterpreted
C. Avoid personal questions
D. Make sure your sample has the information you seek
E. Avoid leading questions
F. Avoid questions loaded with social-desirability
G. Avoid double-barreled questions negation
H. Keep questions short and concise
I. Avoid negations barrel
J. Avoid irrelevant questions

K. Pretest the questions

VI. Analyzing survey data
A. Summarizing data
B. Summarizing interval data
C. Summarizing ordinal or nominal data
D. Using inferential statistics
1. Parameter estimation with interval data
2. Hypothesis testing with interval data
a. Relationships among more than two variables
b. More complicated procedures
E. Using inferential statistics with nominal data
1. Estimating overall percentages in population
2. Relationships between variables

A. Literature review
1. To avoid doing a study that has already been done
2. To learn from others' mistakes and successes

B**. Ethical concerns**
1. Assessing potential gain:
- Is it a test of theory?
- Does it address a practical problem?
- Does it open up new lines of inquiry?
- Be sure you're **not** trying to prove the null hypothesis or unwittingly replicating a study that has been done before.
- Peer review

2. Assessing potential harm:
- Are ethical principles compromised?
- Peer review
- Review by professor
- Review by ethics committee
- Practical concerns

Should scientific principles be used to study humans and other animals?
Only if:
A. The potential benefits exceed the potential harm.
B. The potential for harm has been minimized
II. Maximizing benefits
A. Getting a good, useful idea to test.
B. Providing a valid test of that idea. The study should have at least one of the following three types of validity. The type or types needed depend on the research question.

Documentary Analysis

This is also known as the study of documents where documents are the materials which contain the information we wish to study. It is important to note that all

studies begin by a review of related literature and certain documents; this may become a method of data collection if the research based on available documents.

Documents are divided into two broad categories namely primary (eye witness account written by people who experienced the particular event or behavior) and secondary documents (accounts written by those who were not present during the event but received the necessary information for compiling the documents by interviewing the eyewitnesses or reading the primary documents.

Primary documents may include things like letters, agendas, committee minutes, financial accounts and diaries. Secondary documents may include things like books, newspapers, journals articles etc.

Forms of documentary Analysis: Historical, Literature, Meta-Analysis Diaries and Content Analysis

Content Analysis

Content analysis systematically describes the form or content of written and/or spoken material. It is used to quantitatively studying mass media. The technique uses secondary data and is considered unobtrusive research.
The first step is to select the media to be studied and the research topic. Then develop a classification system to record the information. The techniques can use trained judges or a computer program can be used to sort the data to increase the reliability of the process.
Content analysis is a tedious process due to the requirement that each data source be analyzed along a number of dimensions. It may also be inductive (identifies themes and patterns) or deductive (quantifies frequencies of data). The results are descriptive, but will also indicate trends or issues of interest.

Experimental Designs

1. True Designs
2. Quasi Designs
3. Ex Post Facto Designs

True Designs - Five Basic Steps to Experimental Research Design

1. Survey the literature for current research related to your study.
2. Define the problem, formulate a hypothesis, define basic terms and variables, and operationalize variables.
3. Develop a research plan:
    a. Identify confounding/mediating variables that may contaminate the experiment, and develop methods to control or minimize them.
    b. Select a research design as seen already above
    c. Randomly select subjects and randomly assign them to groups.
    d. Validate all instruments used.
    e. Develop data collection procedures, conduct a pilot study, and refine the instrument.
    f. State the null and alternative hypotheses and set the statistical significance level of the study.

4. Conduct the research experiment(s).
5. Analyze all data, conduct appropriate statistical tests and report results.

Quasi Designs

The primary difference between true designs and quasi designs is that quasi designs do not use random assignment into treatment or control groups since this design is used in existing naturally occurring settings.
Groups are given pretests, then one group is given a treatment and then both groups are given a post-test. This creates a continuous question of internal and external validity, since the subjects are self-selected. The steps used in a quasi design are the same as true designs.

Ex Post Facto Designs

An ex post facto design will determine which variables discriminate between subject groups.
Steps in an Ex Post Facto Design

1. Formulate the research problem including identification of factors that may influence dependent variable(s).
2. Identify alternate hypotheses that may explain the relationships.
3. Identify and select subject groups.
4. Collect and analyze data

Ex post facto studies cannot prove causation, but may provide insight into understanding of phenomenon.

Data Analysis

The data collected in a given research can be analyzed either qualitatively or quantitatively depending on the nature of the data collected. In analysing the data,you need to develop skills in finding patterns in the data and to have the ability to isolate critical facts and information from other information that is not so important. Although the analysis depends on the type of data collected, how the data collected depends on the type analysis anticipated.

Qualitative Data Analysis

Its normally analyzed continuously during and after data collection (Mbaaga 1990). The analysis involves a pure description of events, places, people or objects. This will enable the reader to know what happened, what it was like from the participant's activities etc. In most cases qualitative analysis does not go beyond the measure of central tendency and measure of dispersion (mean, mode, median, range, and standard deviation)

Thus the analysis takes place simultaneously during and after the data collection (Merrian et al 1995), this enables the researcher to make adjustments, restructure and if possible examine emerging concepts not originally in the study design.
How ever NVivo 8 is a software package for analysis of qualitative data, such as transcripts of in-depth interviews, focus groups and field notes.

Quantitative Data Analysis

This type of data can be analyzed by use of statistical procedures after the researcher has measured the relevant variables. The first step in quantitative data analysis is to prepare the raw data and transform them into a data set in machine readable format (in a form that can be read by a computer

Raw data is a collection of unprocessed measurements such as pile of completed questionnaires, strings of numerical codes applied to written texts etc these are then transformed into ordered data set before they can be analysed. The data preparation process involves three important tasks namely;

- Coding
- Entering and
- creating

Coding where the data is grouped into certain categories and assigned specific codes and process involves translating verbal responses into numerical codes that facilitates data manipulation. Then after the data is coded it is entered into computer for analysis using the appropriate statistical package. How ever before the analysis, data has to be cleaned i;e the information has to be edited or cross checked for errors if good results are to be expected and Following data entry, some data manipulation is usually needed to manipulate the entered ("raw") data into structures that are suitable for analysis. Typically, data manipulation tasks include

- *Copying data*
- *Selecting subsets of the data*
- *Restructuring the data to make analysis easier*
- *Transforming data*
- *Merging data at different levels*

Copying data

To avoid confusing the entry and the management, we suggest that you copy the raw data to a second sheet. This is easily done in Excel by creating a new worksheet (Insert => Worksheet), using Edit => Copy to copy the original data to the clipboard, and then Edit => Paste Special (rather than Paste) and clicking the Paste Link button. This ensures that the data in the new sheet are linked to the original data, so that any subsequent changes to the original are reflected automatically in the copy.

It is a good idea to get into the habit of naming sheets. In general your analysis will be simpler to follow if you use more sheets, rather than putting all your information together in a few sheets. But you then need to give them meaningful names so you can easily find them and retrieve the information that you want.
Also, you can take advantage of Excel's facility for naming cells or areas of cells (Insert => Name => Define). This makes it much easier to refer to your data, rather than using cell addresses.

Selecting subsets of the data

It is often useful to look at subsets of the cases (rows) in your data, for example to concentrate on female subjects, or on cases that show abnormally large values for a

particular variable. Excel has some excellent filtering facilities for selecting rows of interest, in particular the automatic filter (Data => Filter => Autofilter). This allows you to display only those rows containing particular values of one or more variables. By using the Custom option, you can specify up to two specific criteria for each variable. All rows that do not meet the criteria are hidden from view (but are not deleted). More complex filtering can be achieved using the Advanced Filter facility (Data => Filter => Advanced Filter), but this is more difficult to use.

Restructuring data

It is often necessary to extract some of the data and convert them to a different structure. The most common requirement is to split a data column into several columns, one for each level of a factor (or combination of factors). For example, we may wish to separate data for males and females, so that we can process them separately or compare them.
We call this process "unstacking", since in list format the data for a variable are held in a single column for all levels of a factor (i.e. stacked on top of each other).

Transforming data

You will commonly need to perform some transformations of the original data (for example, taking logarithms or converting from grammes per plot to tonnes per hectare). This is easily achieved by adding a new column to a copy of the data, and using a suitable Excel formula to transform the data contained in an existing column. The need to add new columns to your data is one of the reasons that we recommend taking a copy of your original data.

Merging data at different levels

When you have data at multiple levels, you may wish to incorporate data about one level in the data at a more detailed level. For example, records about individuals may contain an indication of which household they belong to. You may wish to add some details about the households to the individual data.

This can be achieved using the Excel lookup function. For each column of household information that you want to incorporate, you should create a new column in the individual table and use lookup to extract the appropriate information from the household data for each individual.
The analysis can be done at three levels depending on the investigation of the study namely;

At univariate level of Analysis: frequency tables to provide an enumeration of activity of people that have pre-specified characteristic. Percentages can also be presented so as to show the distribution of people that have certain characteristics within the total population of the study.

Suitable aids to visualizing your data fall generally into the following categories:
Graphics, which give a picture of the structure of your data and the relationships within them
Tables, which enable you to compare values, frequency counts, etc between levels of factors. Other univariate descriptive statistics include measures central tendency

(e.g. mean, median, mode),deciles, quartiles and measures of dispersion(e.g. ,range, mean deviation, standard deviation, coefficient of variation).

At The Bivariate this involves making contingency tables between the dependent variable and the independent (explanatory variables). In order to establish relationship between the independent and the dependent variable Pearson -chi square test statistics can be used to measure the degree of association.

At multivariate can be used to carry out further investigation to establish the relative importance of the dependent variable.

NB programs we teach most statistical packages used in analysis like SPSS, STATA

Difference Between Research Proposal And Project Proposal

A research proposal	A project proposal
Exclusively written by academics and students in institutions of higher learning	Not restricted to academics
Review of related literature is emphasized	Literature review section is absent
Focuses on collecting data on a problem which will be analyzed for drawing conclusion and making recommendation	Makes use of the recommendations of a study to solve the problems of a given community
Bibliography and references are a must	Bibliography and reference may not be necessary
May be written and presented in chapters	Written and presented in sections
Proposals especially written by students may not necessarily be presented to seek financial assistance	The primary aim is to seek financial assistance
May not need a follow up action	Emphasizes a follow up action
Evaluation plan not necessary	Evaluation plan a must

The structure of a research report

- **Title**
- **Table of content**
- **An abstract**
- **Chapter one: Background to the problem**
- **Chapter two: Literature review**
- **Chapter three: Methodology**
- **Chapter four : Results /findings of the study**
- **Chapter five: Discussion, Conclusion and Recommendations**
- **References**
- **Appendices**

    - Timetable
    - Budget
    - Research instruments
    - Field photograps
    - Introduction letters

- Any other important document

Appendix

WRITING UP RESEARCH

This is how method fits into your thesis:

	Introduction: introduction of research problem introduction of objectives introduction of how objectives will be achieved (methodology), optional introduction of main findings and conclusions, optional
	Literature review: review of previous work relating to research problem (to define, explain, justify) review of previous work relating to methodology (to define, explain, justify) review of previous work relating to results (particularly reliability, etc.) i.e identify weaknesses and success
	Method (how the results were achieved): explanation of how data was collected/generated · explanation of how data was analyzed explanation of methodological problems and their solutions or effects
	Results and discussion: presentation of results interpretation of results discussion of results (e.g. comparison with results in previous research, effects of methods used on the data obtained)
	Conclusions: has the research problem been "solved"? to what extent have the objectives been achieved? what has been learnt from the results? how can this knowledge be used? what are the shortcomings of the research, or the research methodology? etc.

	analysis: classes of data are collected and studies conducted to discern patterns and formulate principles that might guide future action
	Case study: the background, development, current conditions and environmental interactions of one or more individuals, groups, communities, businesses or institutions is observed, recorded and analyzed for stages of patterns in relation to internal and external influences.
	Comparison: two or more existing situations are studied to determine their similarities and differences.
	Correlation-prediction: statistically significant correlation coefficients between and among a number of factors are sought and interpreted.
	Evaluation: research to determine whether a program or project followed the prescribed procedures and achieved the stated outcomes.
	Design-demonstration: new systems or programs are constructed, tested and evaluated
	Experiment: one or more variables are manipulated and the results analyzed.
	Survey-questionnaire: behaviors, beliefs and observations of specific groups are identified, reported and interpreted.
	Status: a representative or selected sample of one or more phenomena is examined to determine its special characteristics.
	Theory construction: an attempt to find or describe principles that explain how things work the way they do.
	Trend analysis: predicting or forecasting the future direction of events
	Descriptive narration tells the story from beginning to end in chronological order, utilizing limited generalizations and synthesized facts.

	Interpretive analysis relates one event to another event. The event is studied and described within a broader con- text to add meaning and credibility to the data. For example, an examination of the development of a local jurisdiction's ability to dedicate land for parks may be related to the urbanization and loss of open space in our communities.
	Comparative analysis examines similarities and differences in events during different time periods-for example, the budget-cutting priorities and procedures of the Proposition 13 era of the early 1980s in parks and recreation as compared to the budget-cutting priorities and procedures of today
	Theoretical and philosophical analysis utilizes historical parallels, past trends, and sequences of events to suggest the past, present, and future of the topic being researched. Findings would be used to develop a theory . For example, an analysis of public recreation agency goals and objectives of previous eras can be used to describe the future in the context of social, political, economic, technological, and cultural changes in society.

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Africa Population Institute
P. O. Box 10842, Kampala Uganda
Website: www.africapopulation.net Email: info@africapopulation.net
Tel:+256-772/712-836998

Course Name	: Entrepreneurship Skills & Practice

Course description
The Course explains different approaches to entrepreneurship theory, differentiate between myths & realities about entrepreneurs, differentiate between Intrapreneurship and entrepreneurship, analyze the causes of early failures of entrepreneurial ventures, factors that determine emergence of entrepreneurs, creating and developing the business, searching for and generating business ideas, buying and starting a business, financing new ventures, and franchising.

Course objectives

- To provide awareness and ability to identity opportunities, challenges, and procedures and creates enterprise culture among students.
- To help in changing the attitudes of students so as to become entrepreneurial figures in their everyday lives.
- To help students receive proven strategies and support for starting, managing and growing business.
- To provide knowledge and skills to students in order to develop business plans as well as searching for business ideas.

Course Content
Introduction

- Key elements in the definition of entrepreneurship
- Who is an entrepreneur
- Who is a social entrepreneur
- Why is there a growing need for social entrepreneurs
- Characteristics of social entrepreneurs
- The nature of entrepreneurship
- Approaches to entrepreneurship theory
- Myths and realities about entrepreneurs
- Causes of early failures of entrepreneurial ventures
- What government can do to encourage new enterprises

Factors that determine emergence of entrepreneurs

- Personality factor
- Upbringing factor
- The employment/work history
- Social factor growth of the service sector
- Environmental factors

Creating and developing the business

- Searching for business ideas
- Sources of ideas

Methods of generating ideas

- The focus group
- Brain storming

- Problem inventory analysis
- Strategic window I use to selecting ideas

Buying or starting a business

- Questions to ask before buying a business
- Advantages of buying a business
- Disadvantages of buying a business
- Advantages of starting a business
- Disadvantages of starting business

The business plan

- Overview of a business plan
- Reasons for writing a business plan
- Contents of a business plan

Intrapreneurship (Corporate Intrapreneurship)

- Definition of corporate Intrapreneurship
- Advantages of Intrapreneurship
- Conditions for establishing Intrapreneurship in organizations
- Importance of Intrapreneurship
- Classifications of Intrapreneurship
- Corporate new ventures creation
- What retards Intrapreneurship

Financing new ventures

- Sources of finances
- Advantages of each source
- Disadvantages of any associated source
- Advantages associated with debt financing
- Factors considered before extending a loan

Venture Capital

- Overview of venture capital
- Consideration when raising venture capital
- Advantages of venture capital financing

Franchising

- Description of the term franchising
- Advantages of franchising
- Disadvantages of franchising
- Questions to ask before franchising
- Key things to consider when planning to purchase a franchise
- Areas covered by a typical agreement

Other related topics; Social Entrepreneurs as engines of innovation, patient capital, procuring social investment, social return on investment & its importance, community members as social entrepreneurs, supporting local entrepreneurial talent

Mode of delivery Face to face lectures

Assessment
Coursework 40%
Exams 60%

Total Mark 100%

Introduction

With high unemployment and also public sector retrenchment issues to do with downsizing in organizations and other restructuring programmes in many countries, self employment and small enterprise creation are now being emphasized. As a result, there has been much concern among the policy makers to re-orient the education and training systems to prepare the learners for a condition where formal employment may not exist or may be limited.

In the process, some countries have initiated programmes to put entrepreneurship education on their curriculum. This seeks to develop entrepreneurial skills which will enable the trainees to set their own businesses at some point in the future and also to work productively in Small and Medium Enterprises (SMEs). In most countries of the world, the SMEs account for over 70% of employment and they constitute over 80% of enterprises of all countries.

Job creation depends largely upon the initiation and expansion of the small and medium enterprises and this is basically the work of the entrepreneurs. Entrepreneurs have the ability to generate new ideas and develop new products and services that create new businesses which in turn creates new jobs.

AIM

The aim of this course is to give awareness, ability to identify opportunities, challenges, procedures and to create and enterprise culture among the learners. It also aims at changing the attitudes of people so as to become entrepreneurial in their everyday lives.

Become a more successful entrepreneur by taking one of our courses! You'll receive proven strategies and support for starting, managing and growing your business. If you need help with a business or marketing plan, how to handle employees, how to use internet marketing, how to find financial assistance, how to conduct interviews or how to write business letters, you'll find it in our courses covering all these areas and more in this entrepreneurial category.

We know you're busy and that's why a short course will suit your lifestyle and schedule. Our courses are self-paced and low cost. You decide when working on your class is most convenient, especially during the weekend, in any time-zone. Enroll in our courses and be informed and inspired by the lesson material. Happy learning!

Entrepreneurship Skills and Practice Course has set the learning in which at the end of the course, participants are expected to be able to:

- Understand the different approaches to Entrepreneurship theory.
- Differentiate between myths and realities about entrepreneurs.

- Analyze the causes of early failures of entrepreneurial ventures and develop strategies to curb the situation.
- Know the role played by entrepreneurs in an economy.
- Understand the determinant factors for the emergency of entrepreneurs.
- Differentiate between Intrapreneurship and Entrepreneurship.
- Understand the conditions favorable for establishing intrapreneurship in Organizations, its importance and the different classifications.
- Know and understand the different sources of financing new ventures, the advantages and disadvantages of each source.
- Searching for and generate business ideas /opportunities from different sources using different methods.
- Create and develop businesses after identifying the opportunities for marketing a product or service.
- Systematically, develop and prepare business plans and proposals.
- Locate businesses appropriately after understanding the general elements for an ideal location for a business.

Who is an Entrepreneur?

A common misconception is that any businessman, or anyone who starts a business, is an entrepreneur. But starting a business, according to economists Say and Schumpeter, is not the main component of entrepreneurship. Rather, entrepreneurship is concerned with stimulating economic progress through innovation and action. In the early 19th century, the French economist Jean Baptiste Say described entrepreneurs as “the venturesome individuals who stimulated economic progress by finding new and better ways of doing things.” In other words, entrepreneurs optimize the allocation and use of resources to generate maximal profits.

In order to achieve his economic objectives, the entrepreneur’s mindset must be innovative, creative and goal-oriented. In the words of 20th century economist Joseph Schumpeter,

“the function of entrepreneurs is to reform or revolutionize the pattern of production…by exploiting an invention or, more generally, an untried technological possibility for producing a new commodity or producing an old one in a new way, by opening up a new source of supply of materials or a new outlet for products, by reorganizing an industry and so on.”

Moreover, the entrepreneur thrives on problems and is motivated by the idea of altering an unpleasant situation. Rather than waiting for instructions, the entrepreneur initiates direct action. If the entrepreneur sees a more effective method of doing things, they will not hesitate to do away with existing systems in favor of a whole new approach to a problem. The entrepreneur has the courage to take calculated risks, sometimes even doing “things that others think are unwise, or even

undoable." The entrepreneur also carries projects through to completion and is uninhibited by occasional setbacks or challenges.

Who is a Social Entrepreneur?

The social entrepreneur harnesses entrepreneurship skills to do social good. According to J.Gregory Dees, social entrepreneurship "combines the passion of a social mission with an image of business-like discipline, innovation, and determination commonly associated with, for instance, the high-tech pioneers of Silicon Valley." The social entrepreneur's philanthropic energies are channeled into business ventures, creating value in business so that consumers are willing to pay for the goods and services, and by doing so, the social entrepreneur earns a profit which is invested in the social ventures. According to Martin & Osberg, "the Social Entrepreneur aims for value in the form of large-scale, transformational benefit that accrues either to a significant segment of society or to society at large." Moreover, the social entrepreneur targets its programs at the "underserved, neglected, or highly disadvantaged population that lacks the financial means or political clout to achieve the transformative benefit on its own." Social entrepreneurs are builders of a better world.

A case in Point: Victoria Hale

A few years ago, Victoria Hale realized that vital drugs were not getting to the poor because profit-driven drug companies were unwilling to develop drugs for the poor, who could not afford to pay for them. Determined to challenge this unjust status quo, Hale founded the Institute for OneWorld Health, a nonprofit pharmaceutical company that works to ensure that the poor have access to vital drugs for infectious diseases regardless of their ability to pay. The Institute for OneWorld Health is the first of its kind. Recently, it obtained permission from the Indian government to use a drug, paromomycin, which cures visceral leishmaniasis, a disease that kills more than 200,000 people each year. Victoria hopes that her pharmaceutical model will provide enduring benefits for the disadvantaged.

What is the difference between entrepreneurship and social entrepreneurship?

The entrepreneur's final objective is wealth creation. However, for the social entrepreneur, wealth creation is simply a means to an end. The social entrepreneur participates in profit-seeking business ventures if only to use the profits generated to create valuable social programs for the whole community.

Why is there a Growing Need for Social Entrepreneurs?

In the current economic crisis, financial pressures are exacerbating existing social problems such as poverty and unemployment. According to J. Gregory Dees, social entrepreneurship is necessary to mitigate the financial repercussions on the most vulnerable in society:

"Fewer people will receive adequate health care. Because of the financial burden that formal education can place on parents, fewer children will attend school. Tensions

and violence may increase as the poor compete for jobs and income opportunities...Progress will be lost, as families that have been successful in moving out of poverty fall back into it...As government, business, and household budgets tighten, costly environmental protection and clean-up efforts are in jeopardy...Because many social and environmental issues are time sensitive, failure to recognize the importance of social entrepreneurship and provide adequate support for such efforts during this downturn would be a serious mistake."

THE DEFINING CHARACTERISTICS OF SOCIAL ENTREPRENEURS

Social entrepreneurs are:

Social Catalysts – They are visionaries who create fundamental social changes by reforming social systems and creating sustainable improvements. According to J.Gregory Dees, "though they may act locally, their actions have the potential to stimulate global improvements in their chosen arenas, whether that is education, health care, economic development, the environment, the arts, or any other social field."

Socially aware – Social improvement, as opposed to the creation of profit, should be the ultimate goal of the social entrepreneurs. The success of their endeavors is measured by their social impact, not by the amount of profits generated.

Opportunity-seeking – They pursue their goals relentlessly, seeing every obstacle as an opportunity to develop and fine-tune their business models.

Innovative – They are creative, willing to think outside the box and ready to apply ideas to new situations. They understand that not every innovation will be a success, and they see failures as learning opportunities even as they strive for success.

Resourceful – Their visions are not limited by the resources that they have. Besides optimizing the use of existing resources, they actively expand their resource pool through collaboration with others.

Accountable – Social entrepreneurs are accountable to their beneficiaries, and they often ask themselves, "Am I creating value for the people I am serving? Do I understand their needs?" This is because social entrepreneurs want to know that they are actually making an impact. They are also accountable to investors who want to know that their contributions are indeed stimulating social improvements as promised by the social entrepreneurs.

THE NATURE OF ENTREPRENEURSHIP

Entrepreneurship is a concept that has evolved over time and there has been a lot of questions as to who is an entrepreneur, what is entrepreneurship and what is an entrepreneurial process. However, the word entrepreneurship has been defined in different ways by different authors.

According to Hisrich and Timmons, entrepreneurship is the process of creating something new with value by devoting the necessary time and effort, assessing the accompanying risks and receiving the resulting rewards.

It is the process of identifying opportunities in areas that have been overlooked by others or where there where others see chaos, contradiction and confusion.

Usually an entrepreneur is defined from three perspectives;

- As a manager: Undertaking an activity i.e. defied by the means of particular tasks he7she performs.
- As an Agent of Economic change: defined by the effects they have and the types of changes they create.
- As an individual: defined by the means of their psychology and personality traits.

The key elements in the definitions of Entrepreneurship include:

- Observing the environment
- Identifying something one can do and can get benefit from.
- Devoting the necessary time and effort.
- Accepting the accompanying or likely risks.
- Receiving rewards or profits.

APPROACHES TO ENTREPRENEURSHIP THEORY

There is no universal acceptable theory about entrepreneurship since there are different opinions as the emergence of entrepreneurship. The opinions may be classified into categories in an attempt to explain the entrepreneurship theory.

These categories are:

- The psychologist theory.
- The sociologist theory.
- The Economist theory.

The Psychologist Theory

This theory pays attention to the personal traits, motives and incentives of an individual. (According to Mac Clelland), it is the high need for achievement which drives people towards entrepreneurial activities. He noted that a society with generally high need for achievement or urge to improve produces more energetic entrepreneurs.

In the same way individuals with high achievement motive tend to take keen interest in conditions of high risks and always have a desire for responsibility as well as high level of performance.

The Sociologist Theory
This theory explains entrepreneurship as a process where individual's sociological background i.e. one of the decisive factors to become an entrepreneur i.e. entrepreneurship is a response to unfavorable social conditions.

People become creative (entrepreneurial) in areas where they are socially deprived or where they see the possibility of being disadvantaged. The sociologist believe that entrepreneurship is most likely to emerge under a specific social culture e.g. Social sanctions, where people see some cultural values to be promoted, the role expectations. All these are responsible for the emergence of entrepreneurship.

The Economist Theory
Entrepreneurship was first identified by an economist as a factor of production. Schumpeters (1954) launched the field of entrepreneurship as a tool for innovation. He said that the concept of entrepreneurship lies in the perception and exploitation of new opportunities in the practice of business.

On the other hand other economists pointed out that economic incentive are the main drive for entrepreneurial activities i.e. A person's inner drives have always been associated with economic gains. The incentives and the gains are regarded as the sufficient conditions for the emergence of entrepreneurship.

MYTHS AND REALITIES ABOUT ENTREPRENEURS

- All entrepreneurs tend to be alike. The reality is that not all of them are alike. They are different in terms of their ages, education level experience, skills, etc.
- Entrepreneurs are driven by greed, power and lust for money. The reality is that what really drives entrepreneurs is personal achievement not greed or lust for money.
- Obtaining financing for a new venture is the most difficult step. The reality is tat finance is not the main obstacle but the inadequacy of the financial institutions (banking systems)
- Entrepreneurs are reckless risk-takers. However, the reality is that they are not reckless risk takers. They are also averters i.e. they avoid high risk situations.
- Entrepreneurs sacrifice morals for profits; the reality is that entrepreneurs are honest people of integrity who also depend on the trust of their customers, their suppliers and their money lenders.
- Entrepreneurs must have a good idea but the reality is that it is not only good ideas which matters but also experiences only 1/100 ideas result into business and only 5/10 of the new businesses survive more than five years.
- Some people say that women entrepreneurs cannot be successful. The reality is that women entrepreneurs are more successful than their male counterparts. Reasons
- : They are good at loan repayment, they only consume profits instead of capital for their male counterparts.

CAUSES OF EARLY FAILURES OF ENTERPRENEURIAL VENTURES.

The causes of early failures of entrepreneurial ventures are mainly external and they include:

- **Bureaucracy**: This refers to detailed regulations that are unrequired i.e. long delays in obtaining permits and a complex network of decision makers.
- **Inadequate financial Markets and Institutions i.e. in terms of banking services:** These are not readily available especially to the local population where the majority live. This makes it difficult for entrepreneurs to carry out their transactions in their local areas.
- **Inadequate infrastructure**: In connection with lack of reliable communication network which includes transportation services.
- **Technological problems**: Lack of access to modern technology is one of the main obstacles to new enterprises for those dealing in exports.
- **Issues of culture:** This is one of the most important barriers to entrepreneurship. Most people tend to be reactive and conscious rather than being innovative and assertive (proactive).
- **Low business ethics:** People are not always honest in their business transactions, not fair in their pricing and they also lack trustworthiness, respect for others and property is lacking.
- **Lack of the technical skills** such as experience, planning, single mindedness, and also some people do not know where to invest and therefore some over invest in fired assets

WHAT GOVERNMENT CAN DO TO ENCOURAGE NEW ENTERPRISES:

- There is need for partnership between government and businesses foreign investors and entrepreneurs, International institutions and government.
- Government policy should be favorable i.e. favorable to private initiative thus there must be clear national priorities.
- Clear legal framework covering property rights, transfer of ownership and competition.
- Emphasize reasonable and simple taxes in terms of assessment and administration.
- Provide favorable conditions for International trace, investment and co-operation.
- Control Inflation which encourages people to invest now.
- Scrap unnecessary bureaucratic procedures and employ simple analysis especially in terms of time duration i.e. how long it takes and how many people are involved in giving various permits e.g. when creating a company, buying property, opening an office, importing raw materials, exporting finished products, permission to borrow money from a micro finance institution.
- Provision of reliable transportation, power and communication in terms of accessibility, telephone network.
- Well conceived and realistic strategies and action plans for attracting foreign investment, technical training, management and staff training in Languages, Accounting, Marketing ethics, Professional services, Consulting etc.

- Export development assistance can be offered to entrepreneurs, setting up business development centers.

THE ROLE OF ENTREPRENEURS IN AN ECONOMY

- Promoters of Economic change - They scan the environment and identify opportunities.
- They mobilize resources and implement business ideas.
- They distribute goods and services.
- They spread innovative ideas which expands the boundaries of economic activity,
- Employment Creators Apart from gaining self employment, entrepreneurs also provide job opportunities to others.

- Market Efficiency providers - Entrepreneurs compete for the market as they seek profits, they also ensure that markets are efficient and prices are controlled.
- They also process market information especially by forcussing on information not being exposed yet.
- They transform market information into opportunity and pursue them.

FACTORS THAT DETERMINE EMERGENCE OF ENTREPRENEURS

Many people think that going into business or becoming an entrepreneur is solely to make money. The desire to earn money is infact an important factor but not the sole reason. There are other factors that inspire people to become entrepreneurs:-
They include the following:

- **Personality factor.**

This is one of the factors considered to be a determinant factor in the emergence of entrepreneurs, personally can be looked at differently but generally it is a consistent or persistent belief, feeling and action which makes an individual distinct from another.
Psychologists have been much interested in personality and they have been constantly exploring and investigating it and one of the most acceptable researchers to explain personality has been MacClelland. He identified “Need for Achievement” as the fundamental driving force in the personality of successful entrepreneurs.

According to this theory, an individual need for achievement refers to the need for personal accomplishment and it is a drive to excel or to thrive for success and achieve something that makes somebody become an entrepreneur.
High achievers are not motivated by money alone but instead employ money as a method of achieving their goals.
Other personality factors which make an individual become a successful entrepreneur include ambition, hard work, and strong desire for independence among others.

- **Upbringing factor (Family background)**

The personality factor alone cannot or may not make an individual an entrepreneur. The family background, moral support, encouragement of family members, friends and relatives may lead to growth of entrepreneurship. Previous association in the

family business may also serve as the foundation for building and accelerating the process of becoming an entrepreneur.
Education is equally important in bringing up a child. The educational background also determined the emergency of entrepreneurs. Research shows that most of the technically qualified persons tend to establish enterprises in the fields of their specialization. This shows those entrepreneurs are prompted by their qualifications and educational level.

- **The Employment /Work History**

Employment or worm experiences can provide confidence to the entrepreneurs i.e. people can scrutinize the work – experience and skills from the job being or previously done to start a new venture. This may result from t he opportunity of being in the job e.g. availability of resource expertise. On the other hand, it may be a result of dissatisfaction or losing a job.

- **Social Factors**

Migration or ethnic factors may lead to socially disadvantaged or marginalized society / community. Such groups usually seek ways of survival under harsh conditions. People tend to become creative or entrepreneurial in areas where they are socially disadvantaged e,g Americans today, Japanese.

- **Growth of the Service Sector**

The service sector is growing at a faster rate than before. Most small scale businesses are service providers rather than manufacturers e.g. Telephone services, restaurants, salons transporters, etc. This is because it requires low a capital base to start such businesses and also less overhead costs.

- **Environmental factors**

Environmental factors are not the main motivating factors but they play a role of contributing in the implementation of the entrepreneurship idea e.g. new entrepreneurs may be inspired by the perception of the community in which they live. The government support, assistance from the financial institutions, encouragement from big businesses and success stories of other entrepreneurs.

- **Culture (Norms, Values, attitudes, beliefs)**

Entrepreneurship can be influenced by the culture of the society career. Hofstede identified some dimensions of national culture that may influence the move to entrepreneurship as follows:

- **Individualism Vs Collectivism.**

This dimension of culture is a measure of the relationship between individuals and other people and the degree to which people prefer to have personal freedom rather than groups. This dimension correlates most strongly with entrepreneurship development.
According to Hofstede, individualistic societies are more industrialized than the collectivistic society. This means individualistic societies are more entrepreneurial than those who practice collectivism.

- **Power distance (social group between individuals)**

The power distance evaluates the way a particular society handles inequality among people. Societies with less power distance are more industrialized than those with a wider power distance. In societies where there is less power distance, managers prefer to consult with their subordinates in decision making and also authority can be challenged from time to time. On the other hand, a society wit a wide power distance is less consultative and authorities are not challenged and the people are expected to follow orders without questioning. This means that societies with less power distance are more creative and therefore more entrepreneurial.

- **Uncertainty Avoidance**

This dimension measures how society deals with uncertainty of the future. A low uncertainty avoidance society is that which does not feel threatened by the uncertainty of the future. i.e. It is generally firm and tolerant. Individuals who come from such societies are more likely to become entrepreneurs than those from uncertainly avoidance.

- **Masculinity Vs Femininity**

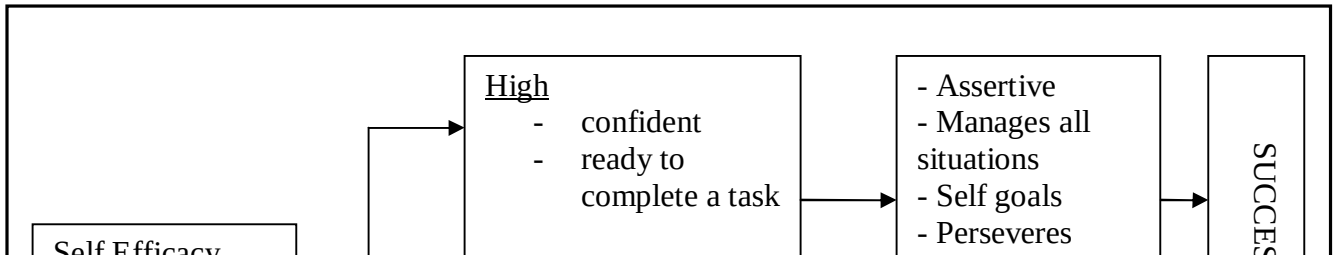
This refers to the inflexibility of sex roles in a given society. Hofstede defines a society as Masculine if there are extensive decisions of roles by sex and as feminine if these divisions are relatively small. The Masculine society is characterized by competition, ambition, assertiveness and aggressiveness, a need to acquire money and wealth. On the other hand, the feminine society prefers solidarity, relationship and quality of life.
Entrepreneurs are more likely to emerge from a Masculine society than from a feminine one.

- **Self Efficacy:**

Bandra Albert (1989) defines self efficacy as the belief an individual has in his /her ability to complete a given task successfully. Self efficacy is about one's perception of his/her competences. It is a higher form of personality combining internal locus of control with goal directness and strategic orientation. The people's sense of capability influences their perception, motivation and performance. An individual's sense of self efficacy manifests in three ways:

- Magnitude i.e. The level of tasks difficulty a person believes can deal with competently.
- Strength of self efficacy - This refers to the conviction that an individual has regarding the magnitude of the task.
- Generally of self efficacy - It refers to the degree to which an individual's expectations are generalized across all situations.

THE SELF EFFICACY MODEL:



Sources of Self Efficacy

- **Past and Actual successes**, where the individual has repeated history of successes, he/she can build a strong belief to perform similar tasks. On the other hand, experience of repeated failure may lead to withdrawals.
- **Performance of others**: The performance of others can serve as a role model. Most people tend to associate themselves with successful personalities whom they want to emulate.
- **Social and Personal Persuasions**: Self efficacy is acquired through suggestions made by some members of the society. And these suggestions may influence an individual to regard him/herself capable.
- **Emotional state**: The reaction of an individual towards a task affects his/her self efficacy about completing a given task.

ENTREPRENEURIAL CHARACTERISTICS

Wickham Phillip noted that although there is a dividing view about entrepreneurship /neurs, there is a great deal of consistence in the way in which they approach their tasks. Wickham observed that there are common characteristics exhibited by almost all entrepreneurs and he identified the following:

- Hard work (innovativeness): Entrepreneurs put a lot of effort both physical and mental in order to create and develop new ventures. So they tend to work for long hours and with a lot of commitment to their work.
- Self-starters: Entrepreneurs identify tasks for themselves without being told what to do i.e. they carry on tasks without waiting for directives from others.
- Goal setters: They are also characterized by setting their personal goals. Successful entrepreneurs set goals which direct their activities and these personal goals become their standard for measuring their performance.

- Resilience /Persistence: Successful entrepreneurs never give up. They usually learn from mistakes to improve on their performance. They tend to recover very quickly from failures and get going.
- Confidence: Entrepreneurs not only believe in themselves but also in the tasks they are performing.
- Receptiveness to new ideas: Successful entrepreneurs accept to learn and change according to a given situation i.e. they are flexible – monitoring changes and adjusting accordingly.
- Assertiveness: Entrepreneurs have freedom to accept or reject something depending on the likely outcomes.
- Information seeking: Successful entrepreneurs are never satisfied with the information they have at any one time. They always seek other sources of information so as to identify possible opportunities.
- Eager to learn: Successful entrepreneurs are always ready to learn more and more and improve on their skills.

- Commitment to Others: Successful entrepreneurs are never selfish, they interact and share ideas and other resources with people i.e. they seek support from others.
- Comfort with power: Successful entrepreneurs are powerful and they enjoy their powers. They use their powers responsibly to influence decisions within the society in which they work.
- Risk taking: Entrepreneurs deliberately take risks and evaluate the various alternatives and they tend to involve themselves in more challenging tasks and always take action to reduce the risks.

CREATING AND DEVELOPING THE BUSINESS:

Creating and developing a business is a process that begins with the perception of an opportunity for marketing a product or service. After the perception of the opportunity, the entrepreneur establishes a business unit and manages it. In order to create and develop a business, the following steps must be taken into consideration.

- Searching for business ideas / opportunities

The task of establishing an enterprise begins with the search for a suitable business idea. The idea may relate to starting a new business or taking over an existing one. The idea should be sound and workable so that it may be exploited in order to get reasonable returns.

- Sources of Ideas

The ideas to start a business may originate from various sources and these include:

a. Success stories of others.

Most entrepreneurs begin their business ventures as a result of successes of those they know. E.g. friends, relatives etc.

b. Though observing the market i.e. all the potential buyers. Potential entrepreneurs should pay close attention to markets for various products and services so as to understand the demand and supply trends of such products and services. Careful observation of the market can reveal some gaps which can be turned into business opportunities.
c. Prospective consumers

Contacts with prospective consumers can provide an opportunity for creating a product or service since the consumers know best what they want.

d. Developments in other nations, people in less developed countries are generally initiators of developed countries. An entrepreneur can discover good business ideas by keeping in touch with developments in advanced nations.
e. Government Organizations.

These include development banks, exports and promotion sectors, The Uganda Manufacturers Association and Investment Authorities assist entrepreneurs in discovering and evaluating business ideas.

f. Visiting many trade fairs / Exhibitions

The natural and International trade fairs are very food sources of information. A visit to these fairs provides information about new products in the market and those that may be introduces at a later stage.

Methods of generating ideas.

Even if a variety of sources are available, coming up with an idea for a new venture may still be difficult. The entrepreneur can use several methods to help generate and test new ideas. The common methods are:

a. The Focus group.

This refers to a group of individuals who provide information in a structured format. They use a moderator to present the question or an idea focusing on some business aspects and the group gives responses.

b. Brain Storming.

This is a group method foe obtaining new ideas and solutions. It is an unstructured process for generating all possible ideas about a given problem within a limited time frame through indiscriminate contributions of participants of participants.

c. Problem Inventory Analysis.

This is a technique where consumers are provided within a list of problems in a general product category and they are asked to identify and discuss products in this category that have the particular problem presented.

d. Strategic Window I selecting ideas.

It is a metaphor which is useful for generating a mental image which can guide the identification, analysis and exploitation of an opportunity. It is a notion that there is always a possibility of something being done better and it assumes that through which a new opportunity can be seen.

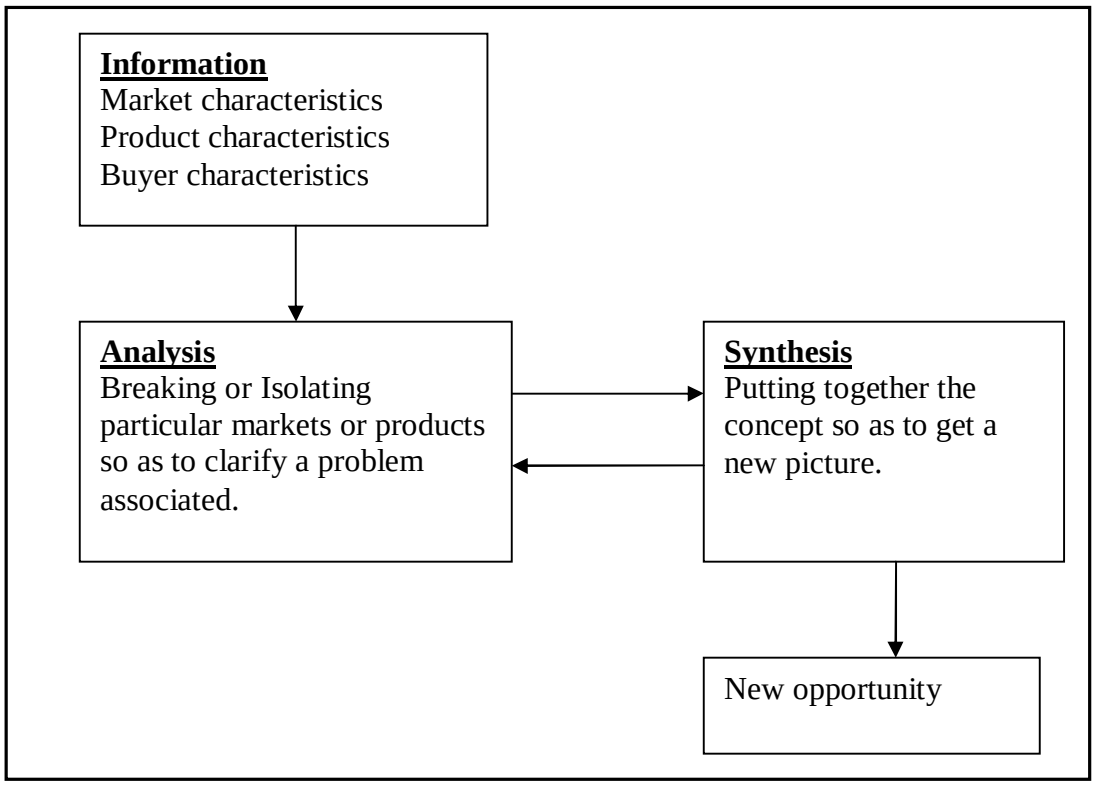
There are five stages of the strategic window:

- Seeing the Window.

This is the first stage in using the strategic window. It involves scanning the environment which is like a "solid wall" and trying to find out the windows which can help in identifying or spotting a possible gap. The gaps or opportunities may be in the areas of developing new products, new services, new methods of production, new distribution channels/routes etc. from existing business.

a. Heuristic technique

This is the most frequently used and it is a method of solving a problem by finding problem by finding practical ways of dealing with them. It involves gathering information, analysis of the market or product and the synthesis.



Diagrammatic illustration of the Heuristic technique.

b. Problem Analysis

This method begins with identification of the needs of individuals or Organizations and the kind of problems they are facing. Once the problem is identified, a question can be asked as for what can be done to improve or solve that problem. The solution will represent the new opportunity for an entrepreneur.

c. Customer Proposals

A new opportunity may be identified by customers recognizing. Their own needs and problems and they make proposals that can provide and opportunity for an entrepreneur.

d. Feature stretching.

This involves identifying the principle features which define a particular product or service and seeing what happens if they are altered e.g. of the size was made bigger, smaller, shorter, larger, etc, strength – harder to softer, speed – fast to slow.

e. Product blending

This refers to a method where new products are created by blending / combining together features from different products.

- **Locating the Window [competitive space]**

This involves developing an understanding of where or how the new venture will locate itself in the market place relative to others. This therefore requires the entrepreneur to relate the opportunity to the established businesses and identify a strategic position.

A strategic position is the way the business as a whole is located relative to the competitors in the market – (competitive space).

- **Measuring the window (Analysis of the opportunity)**

It involves analyzing or evaluating the opportunity and recognizing ther potential it offers. It means finding out how much the opportunity might be worth and this requires information about the size, impact of the opportunity and what risks are involved in taking up such an opportunity.

- **Opening the Window (commitment).**

After identifying, locating and measuring the window, the next stage is to open it. i.e. turning the ideas or opportunities into realities (the actual start of the new business venture). It also involves drawing the commitment of stakeholders towards

the business i.e. creating relationships with investors, suppliers, employees and customers.

- **Closing the window (Sustaining Competition**).

This means giving the new venture some unique and variable character so that competitors cannot follow through the window and exploit that opportunity. It also implies that the entrepreneur must do something that is valuable for customers but which competitors find difficult to copy or match. This means that the entrepreneur should identify some sources such as lower costs, stronger relationship, flexible and responsive organizational structure.

Processing the Idea.

Once the business opportunities or ideas are discovered, screening or testing the ideas is done and the following are put into consideration:

- Technical Feasibility

This refers to the possibility of creating the product or service. This possibility is looked at in terms of the availability of technology, machinery and equipment, raw materials and stalls required.

- Commercial viability

Cost-benefit analysis is required to determine the profit – ability of the ideas. Once the entrepreneur is satisfied with the technical feasibility and commercial viability of the ideas then idea selection is carried out.

Idea Selection.

The idea selection is influenced by products or services whose demand exceeds their supply or products/services which are highly profitable or those which can be exported easily. The selection is also based on products whose incentives and subsidies are available.

Assembling the necessary resources.

Once the entrepreneur is convinced of the profitability of the product /service, there is need to assemble the necessary resources to launch the business. This may also involve choosing partners, collecting the required finances, acquiring land and buildings machinery etc.
Establishing and Managing the enterprise.

This concerns the decisions about the size and layout of the organization. It also involves determining the overall structure of the organization and the managerial levels with clear definitions of areas of authority and responsibilities for each position within the structure.

BUYING OR STARTING A BUSINESS:

A potential entrepreneur can either buy an existing business or start a new one. Each option has some advantages and disadvantages. When the potential entrepreneur decides to buy a business, there are many questions which he/she should ask and some of these include:

- Why do I want to buy this business?
- Why does the owner want to sell it?
- Does the business have a future where it is and the way it is operating?
- Do I have the skills to run this business?
- Will I be happy operating this business?
- Are you buying the name of the business and the right to use that name forever?
- Are you buying the stock, furniture and fittings?
- Are you getting the land and buildings as well?
- Are you paying for the present owner of the business not to set up a similar business nearby?

Advantages of buying a Business

- There are limited risks compared to starting a new one.
- There is an already established relationship with the customers and customers i.e. the name of the business is already in the market place.
- The cash flow of the business is already being generated.
- It has an established service or product i.e. inventory is already in place.
- It may already have trained employees thus reducing training costs.
- It may have a good location i.e. strategically located in terms of customers and suppliers.

Disadvantages of buying a Business

- The product or service may be in a declining stage / market.
- There is limited growth potential.
- Debtors or stock may be too high hence capital tied up.
- The merchandise may be obsolete needing to be disposed off to obtain new one.
- The business may have a bad reputation in the market.
- The location may be poor i.e. where there are no customers and the suppliers may be far from the business.

STARTING A BUSINESS

Most people who want to be entrepreneurs think that the best approach is to start their own businesses and not buy one that already exists. This is because of the following advantages.

- There is greater personal freedom and hence flexibility.

- There is ability to enter a new market or introduce a new product.'
- You may incur lower costs at the start than when buying the existing one.
- There is ability to introduce changes in the business operations right from the beginning to see what should be included, modified etc.

Disadvantages of starting a business.

- Start up has high risks for establishing new business i.e. whether the business will stand or not.
- It requires significant personal involvement and business planning of the business is to succeed.
- The customers / markets may have to be found and developed and this is usually costly.
- Competition from established businesses may be high for the new business to cope up with.
- It may be difficult to fined t he finances for the start up.

CHOICE OF LOCATION FOR THE BUSINESS

Selecting a business location is important for success and failure of the business. It varies from business to business thus the right location is very important for retail business and this may not be very important for manufacturing industries because their customers always locate them.

A decision should be made on the particular community i.e. literate or illiterate, young or old etc.

Select a particular spot with in that community to locate the businesses i.e. put into consideration the customers in terms of convenience for instance how easy is it for customers to come and access the products, is there parking space,, recreational facilities, etc.

- **The economic state of the community (Economic base)**

This may involve looking at the standard of living, average income of the community, level of employment among the members of the community and other businesses in that area.

- **Competition**

There is need to study the competition and collect information about their strengths and weaknesses, find out how many they are and their location.

Find out how many businesses similar to yours that have been newly opened or closed down and the reasons as to why they have closed down.

- **The type of the business.**

Businesses may take many forms but generally they can be categorized as retail, wholesale and manufacturing firms or service firms.

For retail firms, their location should depend on the traffic flow (human traffic) whereas for the wholesale firms, consideration is given to good transportation and distance from the source of raw materials. This depends on the kind of manufacturing firm. For service firms, they need to be located close to large shopping centers.

- **Operating costs at the site in terms of rent, water and power costs.**

THE BUSINESS PLAN

Overview

Before starting on the business plan, it is important to identify the different types of plans that may be part of any business operation. Plans may be short term or long, they also vary in scope from one type of business to another,

Although the plan may serve different functions, all the plans have one important purpose and that is to provide guidance and structure to management, especially in an changing market environment.

Preparing a business plan is a major step in starting and operating a successful business. A business plan can be looked at in different ways. i.e.;

- It is like a "road map" of how an entrepreneur is going to start and operate a business especially in t he first few years [3 – 5 years].
- It could also be a document which strikes out the goals and objectives of a business and clearly outlines how they will be achieved.
- It may also be referred to as a detailed action program outlining every activity of the proposed business venture.

It helps the entrepreneur to answer the questions such as:

- Where am I now? – Vision
- Where am I going? – Mission
- How do I get there? – Strategy
- Why should I get there? – Purpose

Reasons for writing a Business plan (The scope and value of a Business plan).

A business plan may be written for a number of reasons and can be used by many people e.g. investors, employees, bankers, suppliers, customers, advisors, and consultants.
However, there are three perspectives that should be considered when preparing a business plan.

a. The perspective of the entrepreneur.

This is because the entrepreneur knows better about the new venture and must be precise to say what the business is all about.

b. The Marketing perspective.

Entrepreneurs must not only concentrate on the product but must consider their business through the "eyes" of their customers.

c. The entrepreneur should also view the business through the "eyes" of the investors.

The value of a business plan to the entrepreneur

- it is a guiding tool for opening and operating a business
- it is also a guide for managing a business
- it is a tool for monitoring performance
- it helps to attract customers if they see that the products being provided and their purpose is clearly stated.
- It helps and acts as a selling tool in the market.
- It can be a mode of communication between those businesses that need and those that have capital.
- It helps in negotiating for finances from financial institutions
- It enables investors to evaluate investments.

CONTENTS OF A BUSINESS PLAN

1. Introductory page.

This includes the following:

a. The name and address of the business.
b. Name(s) and address (es) of principles – this can be the entrepreneur and his/her management team if available.
c. The name of the business – is it going to provide services or manufacture products.
d. Statement of financing needed – this states the amount of money and the sources as initial capital.
e. Statement of confidentiality of report – this states who owns the business plan (entrepreneur himself) and who else is authorized to use the report e.g. copyrights.

2. Executive summary

This contains the summary of the whole business plan. It includes an overview of t he business, the nature of the business, source of financing, the marketing potential, distribution competences, the vision, mission and objectives of the business.

3. Industry Analysis

This gives the details of the industry in which the business is going to operate from i.e. the services or products to be manufactured.

This section includes:

a. Analysis of competitors – who are they, what is their size, what are there strength and weakness (carry out a SWOT) analysis).
b. Market segmentation – Are the customers to the business teenagers, school goers, adults or infants?
c. Industry forecasts – look at whether the business in which the business is to operate is growing or has potential for growth in future.
d. Future outlook and trends – this involves projecting the sales say 3-5 years, anticipated growth e.g. in terms of shares (5%) market share in a period of 5 years.

4. Description of the venture

This gives a detailed profile of the company, location, date of commencement and its history. It describes the form of business one is to deal in for instance a sole trader, partnership or a company. It also covers the products and services that the products and services that the business is t o provide to its customers (potential).

Other aspects included in the description of the venture are:

- Office equipment and personnel – what equipment will the business need as a manufacturing or service firm, how will these be acquired, is it through loaning? Can one include his/her close associates?
- Background of the entrepreneurs – what are your management skills like as a central person in there business, age, etc.
- Size of the business – how big is the business? Is it small, medium or large?

5. Production plan

In the production plan, the following are considered:

- The manufacturing process. ‘’will the business handle the whole process of manufacturing the products or it will do some subcontracting if so who ate the sub-contractors.
- Physical plant. – How and who will do the installation of the machinery and equipment and what arte the costs of doing it.
- Claimes of suppliers of raw materials – This describes the raw materials to be used in t he production process their sources and the suppliers.

6. Marketing plan

This includes:

- Pricing - state the strategy to be using in marketing the products or services. It involves analyzing whether the market is low or high at the start, whether their is a possibility of making profits or breaking even, whether their is need to give discounts, looking closely at the competitors strategy _(ies) can enable the entrepreneur come up with a good marketing plan.

- Distribution - This involves describing how the business will distribute its products. – will it be locally, regional basis, national or international basis. State the distribution channels and means.

- Promotion - This involves describing the promotional tools the business is to employ when selling/marketing its products or services. Will the business inform its customers about its products through the media e.g.- newspapers, magazines, TVs or over radio stations? The choice of a promotional tool will depend on its efficiency in terms of costs and accessibility to people.

- Product Forecast.

This involves describing the product in detail and relevant. It will be to the customers compared to the products of the competitors to the business. The relevancy could be in terms of quality, price, durability, reliability etc.

- Controls - This involves describing what will be done or put in place to minimize the costs, how distribution will be controlled so t hat customers are not confused in other words, how will the four Ps be controlled i.e. Product, Place, Promotion, and Pricing

7. **Organizational plan.**

This outlines clear roles and responsibilities of employees and other stakeholders of the business. It involves an outline of the methods pf acquiring employees, how they will be places, trained and motivated. It also addresses aspects such as:

- Form of ownership – Is the business a public or private entity (joint venture, sole proprietor, etc).
- Identification of partners or principal shareholders.
- Authority of principals and their responsibilities.
- Management – team background – their names and a brief background i.e. educational level, experience and skills possessed.
- Roles and responsibilities of members of the organization – the organizational structure is important.

8. **Financial Plan**

It includes:

- Proforma income statement. This is a projected income statement estimates of sales, revenue expected over 3 years and the direct /indirect expenses the entrepreneur is likely to incur, projected profits and losses one is likely to incur in 3 years.

- Cash flow projections i.e. what one is likely to bring in and out as the business operates in a period of 3 years.

- Proforma balance sheet.
- Assts and liabilities of the business.

Break – even analysis.

This involves projecting what level of sales will cover the expenses incurred by the business.

9. Appendix

This contains backup material and it may not be included in the business plan but the information their in is important.

The Appendix includes
- letters
- market research data
- lease or contracts
- Price lists from suppliers.

INTRAPRENEURSHIP (CORPORATE ENTREPRENEURSHIP)

Corporate entrepreneurship is a type of entrepreneurship within an existing business structure. It is one method for stimulating and capitalizing on individual creativity within an organization.

Advantages of intrapreneurship

- It is built on an existing structure
- Organizational resources can be used.
- Different activities and tasks can e accomplished by organization employees.

Differences between Entrepreneurship and Intrapreneurship are corporately undertaken.

Entrepreneurs have to exercise personal responsibility while for intrapreneurship responsibility is impersonal. It is a collective responsibility i.e. shared by all members.

Entrepreneurship assumes personal risk and profits whereas in Intrapreneurship there is no assumption of personal risk and profit.

Entrepreneurship involves direct investment of resources while under Intrapreneurship there is indirect investment. The resources are obtained from various sources.

The entrepreneur is motivated by the profits from the business while Intrapreneurship is not motivated by money or profits but the vision or something of value to the organization.

CONDITIONS FOR ESTABLISHING INTRAPRENEURSHIP IN ORGANISATIONS:

1 Secure a commitment to Intrapreneurship in the organization by the top management. Once the top management is committed to Intrapreneurship. The concept can be introduced throughout the organization and once the concept is clear and accepted by everybody, there is need to identify leaders who should be trained about the vision, mission and value of the Intrapreneurship.
2 Identify ideas and general areas that top management is interested in supporting. The target results of each Intrapreneur venture should be established.
3 Determine the company needs for technology to make it more flexible and responsive to changes.
4 Training needs for interested managers so as to establish a firm intrapreneurial culture must be identified and met and this must be done so that the team learns haw to co-exist within the organizational structure.
5 The Organization needs to develop ways of getting closer to customers so that innovations can be made to respond to their changing needs.
6 The Organization needs to establish a strong support structure for Intrapreneurship. This is because Intrapreneurship is a secondary activity that not everybody in the organization will understand.
7 It should be able to tie rewards to the performance of the Intrapreneurship Unit in order to motivate workers to work harder and to avoid members from starting independent and parallel ventures.
8 Establish an evaluation and monitoring system that allows a successful Intrapreneurial unit to expand and the unsuccessful ones to be eliminated.

THE IMPORTANCE OF INTRAPRENEURSHIP

Intrapreneurship appears to be a new concept to many people just like the concept of Entrepreneurship. Much as it is an emerging concept, most organizations attach some importance to it for the following reasons:

1. It enables an organization achieve a competitive edge over her competitors. This is because the world is changing faster than eyes before especially changes in technology, new discoveries, demand etc, organizations find it harder to survive by merely competing and as a result they look towards Intrapreneurship as a means of taking them beyond competition by creating new businesses in new markets.

2. On the other hand employee loyalty is diminishing i.e. employees are no longer tied to one organization but they change from time to time. Employees who feel that their ideas can be bought by another company will always leave so organizations must encourage creatively within they are to survive.

CLASSIFICATION OF INTRAPRENEURSHIP

Hans Scholl hammer provides five classifications of corporate intrapreneurship.

1. Administrative Intrapreneurship.

This is where the organization purposely encourages greater innovation and commercial development of new ventures committing organizational resources for research and development for the purpose of innovations.

2. Opportunistic Intrapreneurship

This is where creative members of the organization are given freedom to pursue opportunities for the organization and individual benefits by exploiting external markets. It is also where large firms take advantage of commercializing ideas generated else where by smaller firms or some individuals especially where they lack resources to implement their ideas.

3. Acquisitive Intrapreneurship.

This is where one organization takes over another company through absorption or mergers etc.

4. Irritative Intrapreneurship:

This is where large companies set up individual espionage / spy to study the product, technology and processes/activities of other companies, and they modify and imitate those companies.

5. Incubative Intrapreneurship

This refers to an intensive in-house effort to establish new methods of innovation where ideas are received from members of the organization and the ideas are developed slowly until it reaches implementation stage by the organization.

CORPORATE NEW VENTRES CREATION

It describes ways in which new ventures evolve in an organization. There are basically two ways of evolving new ventures:

1. The Spontaneous Ventures (Venture Team)

This results from the informal relationships among members of the organization who work together on new ideas. Still under the spontaneous technique of new venture creation, there are four stages of development or team building.

a. Solo stage/phase.

This is where an individual generates and nurtures creative ideas which can be turned into feasible innovation.

b. Network Stage

This is where an innovator seeks advice and support from colleagues to develop the idea.

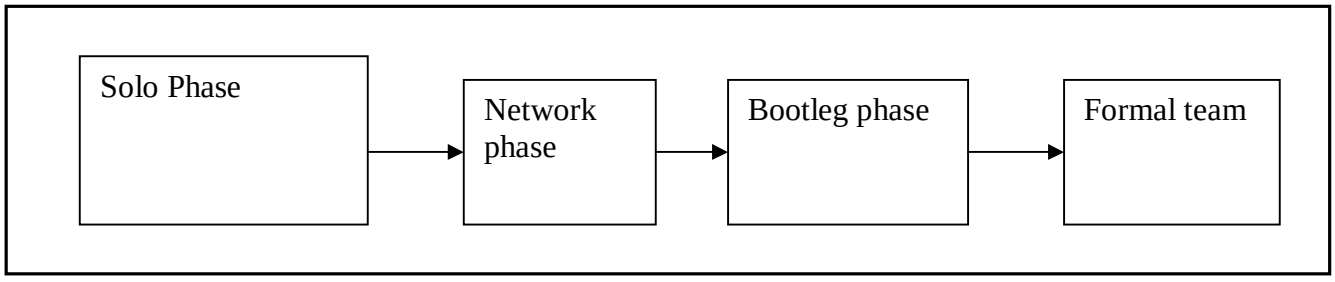
c. Bootleg Stage.

This is where members of the organization work informally as a team and propose ideas as a team to the organization for formal development and support

d. Formal team stage

It is where the company is fully informed of the ideas or business plan and also this is a stage where the team gains corporate support and provides a budget and the mandate for the team to pursue their ideas (the activity is legalized).

Diagrammatic expression.



2. The Formal venture Team.

This refers to deliberate encouragement of team building for the purpose of innovation. There are three stages in the formal venture creation i.e.

a. The Initiation stage.

This is where members of the organization or innovators generate ideas and they form adhoc committees to generate and develop preliminary models and write a draft, a proposal and pass it to the management of the organization for review. If it is approved, they move to the next stage.

b. Feasibility development stage.

Once the idea has been supported the team prepares a budget and a feasibility plan with detailed information and it is forwarded to the committee for another review. Once the plan is approved, the organization proceeds to stage (c)

c. Implementation stage.

This is where the project is introduced to the entire organization and it is transferred to the cooperate management for further development, further research and transfer of technology.

WHAT RETARDS INTRAPRENEURSHIP

1. The cost of failure Vs the rewards for success. The cost of failure is high while the reward for success is too low (low bonus) and since the reward is low and yet the cost of failure is high, members of the organization may relax.

2. Inertia caused by established systems or structures that no one is willing to change i.e. most organizations are governed by implicit or explicit systems and in many cases people are reluctant to change. Many organizations use their existing systems to show that they already have the right answer at the expenses of creating.

3. Hierarchy

Organizational hierarchies may create a need to ask for permission before something can start. The deeper the hierarchy the harder it is to get permission for anything new. People lower down the hierarchy become powerless and less creative or innovative.

4. Ownership which can either be public or private.

Usually public organizations called public ownership limit the workers' tendency to be creative /innovative. On the other hand private ownership encourages workers to be more innovative.

FINANCING NEW VENTURES

Sources of finances:

a. Equity financing: Here owners provide finances by exchanging ownership for capital sources of equity finances may include.

- Personal savings in terms of assets, money or cash
- Family members and friends through collective effort.
- Partners - these may be other persons with whom you share common ideas not necessary family members or friends.

Advantages of each source include:

- Personal savings equity implies that all the profits belong to the individual.
- With personal savings, the burden of debts is reduced
- It shows good faith to any potential lender since the entrepreneur already has something at hand to start with.

However this source is associated with the following disadvantages.

- It requires personal sacrifices which means postponing consumption
- All the losses are suffered by the owners of the business.

Family and friends (Advantages)

More cash is available for the business
There is ability to borrow more
There is a possibility of sharing any financial risks that may occur.

However, it is associates with disadvantages such as:

- One may have to give up part of the profile to the family members and friends since they also contributed towards the business.
- Disputes may arise among family members and friends as a result of unproportional sharing.

Advantages of partnership

- It is one of the easiest sources of cash
- There is a possibility of having less pressures of work because responsibilities can be shared amongst members.

Disadvantages of partnerships

- There is a risk of destroying personal relationships with individual customers.
- Misunderstandings may arise among partners if the agreement is not followed critically.
- It may lead to slow decision making because of the need for consultations among partners before deciding on anything.

b. Debt Financing /Credit financing/Asset based financing.

This refers to accounting a loan which means collateral security must be provided in order to acquire a loan. Collateral security can include either fixed or current assets.
Some interest is charged on the borrowed money which is considered as the cost of borrowing. When equity sources of financing are not adequate, the entrepreneur has the option of borrowing from other sources which is referred to as debt financing.

Advantages associated with debt financing.

- The entrepreneur maintains control and ownership of the business without bringing in the lender's ownership.
- The entrepreneurship may pay at more convenient intervals.
- It forces the entrepreneur to save money in preparation for the repayment of the borrowed funds.
- It is advantageous at the time of inflation in that the entrepreneur may repay at cheaper currencies. However, this source of financing as associated with some advantages such as:
- The lender imposing restrictions on the borrower.
- It is easy to abuse and overuse. Lenders are careful not to lend money if the risk is too high. Most lenders therefore will review the business plan carefully.

FACTORS CONSIDERED BEFORE EXNTENDING A LOAN

Different lending institutions have different aspects put into consideration before extending a loan to the applicant. They include:

- The type of the loan – is it long, medium or short term.
- The purpose of the loam – most lenders do not want to loan to illegal business.
- Credit history / worthiness – can the borrower be trusted. This is revealed by the bank's records and suppliers to the borrower.
- The capability of the entrepreneur – they look at the business profile of the applicant i.e. as revealed by the cash flow statements.
- The re-payment period – this is important to both the borrower and the lender.
- Security – what kind of collateral property covering the property of the company/entrepreneur. This is known as a secured loan.
- Guarantors – these could be from friends, employers or reputable persons whose opinions is reliable.
- Economic conditions, political atmosphere and its stability together with ´government policy.

FINANCING SMALL BUSINESSES

Money, capital or cash is very important and one cannot start or run a business without it. However, raising the money one needs can be a complicated and frustrating experience. Very few entrepreneurs know that there is plenty of investment money out there if one knows where to look. One will discover a variety of sources of financing from banks and micro finance companies.

Venture Capital

A business' ability to raise finance can often make or break it. This can be an especially testing time in the life cycle of the business as raising finance can sometimes be a stumbling block for many business owners.

While there may be a number of options available, often the more traditional methods such as bank loans just do not meet the needs of some businesses. And therefore the answer for such businesses can lie with venture capital.

Venture capital works well with businesses that possess real growth prospects coupled with skilled, ambitious management.

Venture capital can be defined as a financial investment into one Business Company from an independent outside source such as another company, firm or specialized venture capital fund.

It defers from more traditional finance sources such as banks or lending institutions because venture capitalists arte in the market to take more calculated risks when it comes to their investments.

In return for taking such risks, venture capitalists require a higher rate of return ob their investment. This means depending on the individual business arrangement, that the venture capitalist will effectively become a partner in your business requiring financial compensation in the form of profits and or shares.

Securing investment from a venture capital firm means entering into business partnership and the venture capitalist is ready to also share in the risks and rewards of the business he has invested in.

They promote growth in the businesses and companies they invest in. This is because they eventually sell their shares in the business or company which can be three – seven (3-7) years after the investment.

Each firm will have a different approach to tits investments some may look for business that are in the 3 start-up phase or that need capital to manufacture a new product while others may look to invest in expanding companies or those which specialize in a particular industry.

It is therefore important to do research to make sure the venture capitalist approached is likely to be interested in your proposal.

Considerations when raising venture capital.

Raising any type of capital needs research and strategic planning before approaching any source one needs to have:

- A good business plan with an executive summary.
- Assessed that private equity is suitable the business.
- Analyzed how much finance is needed and what it will be used for.
- Identifies those finance sources that meet his/her requirements.

One may need to ask him/herself questions like the following when it comes to venture capital:

a. Do you have the high growth ambitions for your company?
b. Are you willing to sell some of your shares to a venture capital investor in order to be able to increase your stake's value to more than that of your original holding within a few years?

The entrepreneur should then draw up a short list of potential venture capitalists and then contact the venture capital firm and request of investments they favor.

Advantages of Venture Capital financing:

- The venture capitalist can provide long-term finance which can be a solid base for business growth. Depending on your arrangement, the venture capitalist may also be willing to provide an additional funding boost when required for financial advice.
- In essence a venture capitalist is a business partner who is sharing the risks and obviously the rewards.
- The venture capitalist can also be a mentor for the business or company in which he/she has invested by providing strategic operational and financial advice.
- One can also take advantage of the network of contacts the venture capitalist has. This can add value to the business in dealing with suppliers, manufacturers, retailers etc. It can also be beneficial when looking for co-investment.
- The venture capitalist is also experienced in the process of preparing a company for initial public offering (if required) and helping in trade negotiations and sales.

GOING PUBLIC

This refers to a private company's action of making an initial public offer (IPO) thus becoming a publicly traded and owned entity. Businesses usually go public to raise capital in hopes of expanding.

Venture capitalists may use initial public offers (IPO) as an exit strategy that is a way of getting out of their investment in a company.
The IPO process begins with contacting an investment bank and making certain decisions such as the number and price of the shares that will be issued.

Investment banks take on the task of underwriting or becoming owners of shares and assuming legal responsibility for them. The goal of the underwriter is to sell the shares to the public more than what was paid to the original owner of the company.

Deals between investment banks and issuing companies can be valued at hundreds of millions of dollars some even hitting $1 billion.

Positive effects of going public.

- it strengthens the capital base – the business is able to borrow from financial institutions.
- Makes acquisition easier – Money lenders have confidence in transferring of company assets.
- Diversities ownership – Different people have different expertise hence efficiency.

- Increases prestige – Makes the entrepreneur more stable than when it is private.

Negative effects

- Puts pressure on short-term growth – this is because the public is usually concerned about the activities of the company.
- Increased costs – in form of dividends to shareholders.
- Imposes more restriction on management and on trading
- Makes former owners of the business to lose control over decision making in the company.

For some entrepreneurs, taking a company public is the ultimate dream and mark of success (usually because there is a large payout). However, before an initial public offer can be discussed, a company must meet requirements laid out by the underwriters.

Characteristics that may quality a company of an initial public offer.

- High growth prospects
- Innovative product or service
- Competitive in the industry.
- Able to meet financial audit requirements
- Revenues of approximately $10-20 million per year with $1million profits.
- Management teams should show future growth of about 25%per year in a 5-7 years span.

The process of Going public / Flotation

When a company decides to list its shares on a stock market. It has to go through an elaborate process before its shares become quoted i.e.

- The company publishes a prospectus describing its business who its directors are, what its financial position is and what profits it thinks it is going to make. The information it includes has to conform to strict guidelines so that potential investors are not misled.
- The prospectus announces the issue of new shares sets an offer price for the shares and invites subscriptions. In some cases a company will not actually set a price for its shares but will have an “offer by tender “ effectively an auction in which investors bid for shares.
- In a flotation, a company raises money by issuing new shares in what is known as the ‘primary market’. Once the shares are listed, further trading in them occurs in the secondary market – secondary in a sense that it is a second stage market between investors that does not involve the company itself.

Strategies for Going Public

Going Public represents a significant milestone for any company. The Initial Public Offer (IPO) market grew more than 200% in 2004. With all its rewards however, an

IPO is complicated and time consuming. It involves a high degree of risk and requires an extraordinary level of management commitment.

A Summary of what to consider in Going Public.

- Should you Go public? Public ownership offers significant benefits to a company and its shareholders but also has disadvantages. Therefore the pros and cons and alternatives must be weighed when making a decision.
- Timing: Evaluating your company's appeal to investors and the state of the market is important in deciding whether to Go Public. A business plan will enable you to move quickly and seize market opportunities.
- Your team: Specialized professionals are required for taking a company Public. There is need to identify who you need and offer brief overviews of their participation.
- Pre-Public planning: This deals with steps that must be taken to prepare a company for a public offering. It also provides insight into the roles of your management attorneys, accountants and financial public relations firms.
- The Underwriters: Competent underwriters are critical to the success of your public offering. The criteria for selecting underwriters and also the criteria underwriters use for deciding whether they want to take the company public should be understood. The factors they consider when pricing your stock should he clear.
- Registration: Every member i.e. the entrepreneur, the underwriters, the attorneys, accountants will be involved in registering the company with the Securities and Exchange Commission.
- The waiting period: The actual selling efforts occur during the weeks immediately preceding the effective date of your registration statement. You should be aware of the rules governing what you can and cannot do and say during this period and what your involvement is in the selling effort.
- Closing the deal: When your registration statement is effective, the remaining events in the process occur quickly.
- After you go public: When the offering is complete, looks ahead to responsibilities as a leader of a public company especially your relationship with the financial community, reporting requirements and several securities laws.

Criteria for Evaluating Loan Sources:

The cost: What are the benefits of getting a loan in relation to the costs. This cost is in terms of the interest rate or cost of borrowing. The cost of a loan is usually measured by its impact on the earnings of the business.

Flexibility of the loan source: Will the conditions imposed by a loan source reduce flexibility in seeking for other capital? Can there be possibility of seeking for other alternatives? The more the flexibility of the loan source, the source.

Control: How does the loan affect the owner's control over the business? If the source of the loan prevents the entrepreneur from controlling the business does it allow the entrepreneur to make operating decisions or not?

Risks to which the business is exposed as a result of the loan. This refers to the conditions which are attached to the loan in case one fails to pay back. E.g. taking over the ownership of the business or selling it off. Usually the best option is to go for sources with lower risks.

The lending experience of the source especially with small business enterprise. Does the source have a good reputation for dealing with small scale businesses or they are harsh and unreliable.

Are there some special requirements for the lender for instance opening an account with a specific bank before obtaining the loan and should this account be opened with a specific minimum amount, procedures to follow for instance documentation about the client, the maximum amount to be obtained might be dictated.

FRANCHISING

Taking on a Franchise is an option worth considering for anyone who wants to run a business but does not have a specific business idea or prefers the security provided by an established business.

The word Franchising comes from the French word 'Franchir' which means 'free' originally it meant to free from "slavery". Today it has several other meanings: One of the acceptable meanings is that.

It is an arrangement whereby the manufacturer or distributor of a product or provides of services gives exclusive rights of local distribution to independent retailers in return for payment and conformance to standardized operation procedures.

This is common in the automobile, beverages, book and electronic industries.

A franchise is a form of business ownership created by **Contract** whereby a company (Franchisor) grants to a buyer (Franchisee) the rights to engage in selling or distributing its product(s) or services under a prescribed business format in exchange for royalties or shares of profits.

Advantages of franchising

- Your business is based on a proven idea. You can check how successful other franchises are before committing yourself.
- You can use a recognized name and trademarks. You benefit from advertising or promotion by the owner of the franchise.
- The franchisor gives you support – usually including training, help setting up the business: a manual telling you how to run the business and ongoing advice.
- You usually have exclusive rights in your territory. The franchisor will not sell any other franchises in the same region, though there will be competition from other businesses.

- Financing the business may be easier. Banks are sometimes more likely to lend money to a franchise with a good reputation.
- Risk is reduced and is shared with the franchisor.
- You have an existing customer base and do not have to invest time looking to set up one. Customers will always buy the product because they are already aware.
- Relationships with suppliers have already been established.

Disadvantages of franchising.

- Costs may be higher than you expect . in addition to the initial costs of buying the franchise, you may continue to pay royalties and you may have to agree to buy products from the franchisor.
- The franchise agreement usually includes restrictions on how you run the business. You might not be able to make changes to suit your local market or environment.
- Other franchisees could give the brand a bad reputation and eventually affect sales.
- You may find it difficult to sell your franchise – you can only sell it to someone approved by the franchisor and may not be easy.
- Reduced risk means you might not guarantee vastprofits.

Questions to ask before buying a franchise.

- What is the business and how does it operate? There is need for a better understanding of a business before taking it up.
- How long has the franchisor or company offering the franchise in business? This is because the longer they have been in business the larger the customer base.
- Is there a strong demand for the franchisor's products or services?
- What is the strength of competition from other businesses? Competition should be minimal to allow fast growth and expansion.
- Is the location of the franchise convenient? Can the customers and suppliers locate you easily without difficulty?
- Will the franchise company provide you with everything you need to be successful e.g. equipment for storage etc.
- Will you be happy with the restrictions imposed by the franchise arrangement? This is because these restrictions can have an impact on the morale of the workers and even the managers' flexibility.
- Can you afford the franchise fee? It should not stress you financially because you might take long to recover it.

Key things to consider when planning to purchase a Franchise (The Dos)

- Assess yourself to see what kind of franchise if any will suit you.
- Find out what franchises are available.
- Do your own market research into customers and competitors in your area.
- If you will need to raise bank finance, ask your bank if it will need consider a loan for the type of franchise you are considering.

- Draw up a business plan – indicate other strategies to enable you succeed.
- Check the franchise agreement and get professional advice.

Areas covered by a typical agreement are:

- **The term:** How long does the franchise last? Can it be renewed and on what terms?
- **Territory:** What area does your franchise cover, and do you have exclusive rights to sell within it?
- **Fees:** What initial fee will you pay? What royalties will you pay on sales? Will you have to pay other costs and how are they worked out?
- **Support:** How much help will you get purchasing the franchise? What continuing support will you get?

- **Restrictions:** What restrictions are there on what you are allowed to do and how you must run the business?

- **Exit:** What happens if you cannot continue in the business for some reason? Perhaps due to ill health? And what happens if you want to sell your franchise.

The Disadvantages:

It is advisable to make sure you don't:

- Take up the first opportunity before investigating alternatives this is because there could be better alternatives.
- Allow yourself to be hurried into making a decision – first think and analyze the situation.
- Pay any non-refundable deposit.
- Commit yourself before you are completely satisfied i.e. getting into the agreement.
- Assume that a franchise will automatically give you customers or assume that it will work in your area just because it works elsewhere.
- Rely on the forecasts provided by the company selling you the franchise.
- Sign any agreement without legal advice.

Social Entrepreneurship: Not Just Charity

Social Entrepreneurship cannot be confused with charity. While charity reflects the benefactor's compassion for humankind and is measured in terms of the generosity of donations to the less fortunate, social entrepreneurship reflects more than the good intentions of its practitioners, who are not merely driven by compassion, but are also compelled by a desire for social change. Oftentimes, charitable organizations survive at the mercy of their donors whose contributions vary with the economic climate. A nonprofit that practices social entrepreneurship, on the other hand, relies less heavily on donor funds because it creates social programs that are meant to be self-sustaining. Social entrepreneurs manage donor contributions in an effective manner, investing in social ventures which can then generate their own revenues to sustain themselves.

In other words, while charity uses donor funds to buy food to ease the poor's hunger, albeit only temporarily, social entrepreneurship uses its funds to make a lasting social impact, creating instructional programs that teach the poor how to grow their own food so that they can take care of themselves in the long run. In a world of scarce resources, it is no longer enough to simply donate out of good intentions. Rather, Greg Dees emphasizes the need for people to value the social impact that their donations are actually having:

"In society, I'd like to see more value placed on social impact and success than on good intentions or effective marketing or the severity of the need you're claiming to serve. I'd like to see a fundamental change in ethics or culture around that. We still have the lingering effect of a culture of charity, which honors people for their sacrifice—how much they give and the purity of their motives. The word charity comes from the word "caritas," which is Latin for love or compassion. We're rewarding people for demonstrating their love of humankind, but we're not often looking to see whether it has the intended impact. So I'd love to see an ethics change, so that we honor people for the impact they've had directly, or indirectly in choosing to support programs and organizations and individuals that have had impact, not just for how much they give or how generous they are."

Moreover, social entrepreneurs have to identify opportunities that have the potential to change the world. In the words of Martin J Fisher & Kevin Starr, the authors of Real Good, Not Feel Good:

"We can no longer afford to spend scarce funds on things that simply feel good. Instead we need to support initiatives that do real good, and that have the potential to generate large-scale and lasting solutions to the world's biggest problems."

Social Entrepreneurs as Engines of Innovation

Just as business entrepreneurs are willing to take risks and play around with ideas until they find one that works, social entrepreneurs must dare to innovate even if it means treading where no one has ventured before. Of course, not all social innovations are successful. But even so-called failures are usually blessings in disguise because they inform the social entrepeneurs what to avoid in a future enterprise. Since social entrepreneuers work in a variety of different social contexts throughout their career, with each new situation demanding a different approach or even a different solution, they must be flexible in the way they think and approach problems.

Innovation – A Tool to Better the Whole Society

There is no doubt that innovation plays a vital role in any entrepreneurial enterprise. While the ability to generate innovative ideas is important, this alone cannot make the social entrepeneur successful. Many people can think creatively and generate a lot of ideas, but many tend to rest on their laurels once their own problems are

solved. According to William Drayton, the social entrepreneur effects a paradigm shift in the whole society:

“There are many creative, altruistic, ethically good people with innovative ideas. However, only one in many thousands of such good people also has the entrepreneurial quality necessary to engineer large-scale systemic social change. Entrepreneurial quality also does not mean the ability to lead, to administer, or to get things done; there are millions of people who can do these things. Instead, it refers to someone who has a very special trait -- someone who, in the core of her/his personality, absolutely must change an important pattern across his/her whole society. Exceedingly few people have this driving motivation. Most scholars and artists come to rest when they express an idea; many managers relax when they solve the problem of only their company or institution; and most professionals are happy when they satisfy a client. It is only the entrepreneur who literally cannot stop until he or she has changed the whole society.”

A Case in Point: Andrew Carnegie & the Birth of the Library System

“Imagine that Andrew Carnegie had built only one library rather than conceiving the public library system that today serves untold millions of American citizens. Carnegie’s single library would have clearly benefited the community it served. But it was his vision of an entire system of libraries creating a permanent new equilibrium – one ensuring access to information and knowledge for all the nation’s citizens - that anchors his reputation as a social entrepreneur.” – Roger L. Martin & Sally Osberg in the Stanford Innovation Review

Social Entrepreneurial and Eye Care

Unite For Sight supports eye clinics worldwide by investing human and financial resources in their social ventures to eliminate patient barriers to eye care. The village and slum communities where Unite For Sight and the eye clinic partners now work had not previously had access to eye care due to many patient barriers. Unite For Sight's model enables the local ophthamlologists to create real change and a sustainable impact for those living in extreme poverty. With Unite For Sight's support, the local ophthalmologists develop and lead eye care programs that provide high quality, cost-effective care to the world's poorest people.

Unite For Sight’s programs are sustainable because emphasis is placed on nurturing and developing local potentialities so that eye clinics can meet local eye care needs on a long-term basis. Unite For Sight provides the necessary support to cultivate leadership, talent and ideas among its eye clinic partners. Not only are eye care programs led by local staff, but local volunteers are also trained to serve as support staff at local eye clinics. To nurture local talent, visiting specialist volunteers, such as ophthalmologists, optometrists and ophthalmic nurses, provide training to local specialists. Unite For Sight’s model is able to significantly increase the number of surgeries provided by local eye clinics annually. For more information, visit http://www.africapopulation.net

Unite For Sight works with partner eye clinics to provide local solutions, identifying, and overcoming community-specific barriers to effective healthcare delivery, such as transportation and communication. Patients are transported to and from the eye clinic. Moreover, local community leaders and members are involved in outreach activities, raising awareness and providing education regarding eye care to those who would otherwise not have access to eye care. Unite For Sight's model has been employed successfully in a variety of different social contexts in Ghana, Honduras and India.

The Social Venture – A Success or a Failure?

The primary indicator of success lies in the actual impact of the social initiative. To put it simply, a social venture is successful if it achieves its intended social impact.

Capturing the Impact – The Mission Statement

The social entrepreneur should state the intended social impact in a brief and specific mission statement. For example, "poor families will earn more money" or "fewer people will get, and/or die of, malaria." Statements like "fighting poverty and injustice" or "improving lives" are simply too vague to be useful.

Measuring the Impact & Establishing a Correlation

The social entrepreneur can now assess whether the social program actually measures up to the mission statement. To measure impact, one has to gather concrete statistical data. For instance, if the mission statement is "poor families will earn more money," then the income data of these families before and after the intervention should be collected and analyzed. The impact can then be quantitatively measured. Of course, owing to the sometimes varied and complex nature of the impact, it is often up to the social entrepreneur to find a suitable metric that can capture results with integrity.

However, it is insufficient to simply measure the impact.. More importantly, the social entrepreneur must prove that the social programs are indeed the interventions responsible for producing the desired changes. For this purpose, scientific randomized trials involving control groups could be done to study the correlation between a particular social initiative and the perceived social changes. Otherwise, one could rely on the past studies of similar programs in similar contexts conducted by other social entrepreneurs or researchers. The social entrepreneur must provide concrete evidence to justify the efficacy of the social endeavors. According to Fisher & Starr,

"A project working to reduce the incidence of malaria by distributing mosquito bed nets must demonstrate that the incidence of malaria is in fact reduced. It is not enough to simply report on the number of nets distributed - the link to impact may

not be there. Nets can be improperly used, sold by the beneficiaries for quick cash, or even used as fishing nets. Simply tracking activities is not enough - you need to track the impacts of those activities...A project that aims to reduce poverty by helping poor people to start businesses needs to show that the participants earn significantly more net-income after the intervention than they did before it. Business training or access to credit may not in fact get people out of poverty—measuring incomes is the only way to know."

Cost-Effectiveness

Funding for philanthropic purposes can be extremely limited. As such, it is important to keep track of the amount of donor funds required to produce a given impact. For example, for every dollar spent in a poverty reduction program, by how much do the incomes of the people rise? The social entrepreneur must strive to be cost-effective, optimizing every dollar to produce the greatest benefit for the beneficiary. The programs should also be evaluated to determine if the programs are going to be cost-effective over time, in the future. Fisher and Starr also offer additional advice: "Cost-effectiveness is relative, so compare the project to other projects working to produce the same impacts in similar areas. If you have nothing to compare it to, then at least ensure that the effectiveness can be measured and that it feels reasonable to you."

Sustainability in the Long Run

A crucial question is whether the social initiative would be sustainable in the long run. What would happen to the program once the inflow of external funding stops? In an effective program, the initial positive impact should not fade away, but should continue to generate benefits even with scarce, decreasing funding. Fisher and Starr urge social entrepreneurs to continually ask the following questions:

"Will the people who are given mosquito nets continue to use them? Will the nets continue to be effective? Will they get replacement nets? Will new people want, and be able to get, nets?... Will the businesses that people have started continue to prosper? Will new people be able to start new profitable businesses?"

According to Fisher and Starr, in order to have sustainable impact, a social program should have one or more of the following characteristics:

> "The project can leave in place a business model and supply chain, which will continue to provide the required goods and services at a profit."
>
> "The project can hand-over the provision of goods or services to the local government – which will fund the continued interventions by collecting taxes." Though this is a viable option, it is unfortunately not always sustainable to rely on the government.
>
> "The project can leave in place a self-sustaining community process to provide a solution to a local problem with no external source of funding."

"Finally, a project can work to permanently eliminate the problem it is trying to solve. Either it can get rid of the problem itself, or it can permanently change a no-cost social behavior…"

A Case in Point: The Grameen Bank, A Model of Sustainability

Muhammad Yunus, the founder of the Grameen Bank and winner of the 2006 Nobel Peace Prize, found a solution to the plight of poor Bangladeshis who are unable to acquire funds to start their own business – microcredit. He lent $27 of his personal funds to a group of poor women, who quickly started a sewing business that was able to generate enough income to help them pay back the loan, and more importantly, to rise above poverty. Thus the idea of the Grameen Bank was born. According to Martin & Osberg, "Grameen Bank sustained itself by charging interest on its loans and then recycling the capital to help other women." Having thus proven microcredit to be a sustainable method of combating global poverty, Yunus continues to inspire organizations worldwide to adopt the Grameen model to combat poverty in their own communities.

Learning Outcomes: Sharing Knowledge With Other Social Entrepreneurs

After assessing the impact of a social venture, the social entrepreneur will know whether it is successful or not. Successes and failures are equally important because the social entrepreneur draws valuable lessons from both. More importantly, the social entrepreneur also shares knowledge of what works and what doesn't with other social entrepreneurs to help them achieve progress in their respective social projects.

Learning Outcomes: Scaling & Replicating The Impact Elsewhere

According to Fisher & Starr, "developing successful models for social change is expensive and we can't afford to reinvent the wheel every time." The best projects are normally those that, with a few minor modifications, can be rescaled and replicated in a variety of different social contexts to address a similar problem. The Grameen model of poverty reduction is successful not only because it is sustainable and cost-effective, but also because it can readily be adapted to serve the needs of different communities with different sets of cultural and social needs. In fact, so successful is microfinance that it is now even being implemented in developed countries like the United States to reduce poverty.

An Emerging Trend: Social Venture Investors

While venture capital was predominantly invested in such industries as semiconductors, biotechnology, and the internet in the past, venture investors today are increasingly attracted to small business models that, in addition to their

potential to earn attractive financial returns, could yield social benefits. Many venture investors increasingly recognize that there is no need for a tradeoff between earning profits and delivering a social mission. Already many industries, such as clean energy and organic foods, are getting investors' attention, and their 'patient' capital.

"There's more attention in this space, and with attention, more investors want to participate... it becomes less a fringe and more acceptable. In a few years it'll be closer to mainstream." - Deb Parsons, business development director at Investors' Circle

What is 'Patient' Capital?

"Patient capital is another name for long-term capital. With patient capital, the investor or backer is willing to make some type of investment in a business with no expectation of turning a quick profit. Instead, the investor is willing to defer any return for an extended period of time."

Patient capital is revolutionizing the concept of philanthropy. Social entrepreneurs are no longer content with traditional philanthropy – which is normally the giving of direct, temporary aid to relieve poverty – as the best way to alleviate poverty. Patient capital allows social entrepreneurs to bring their business acumen to bear on social issues. By combining patient capital with their talent and knowledge, social entrepreneurs strive to perfect the correct models for delivering basic goods and services, such as housing, healthcare, energy and clean water, to the underserved market of the poor in the most effective and efficient ways.

Patient capital is based on the philosophy that everyone should have access to basic goods and services. It targets the poor consumers.

'Patient' Capital as a Poverty-Reduction Tool

"People grow out of poverty when they create small businesses that employ their neighbors. Nothing else lasts." - Thomas L. Friedman

Moreover, according to Friedman, many people do not aspire to become entrepreneurs because they would rather be followers of certain risk-taking leaders and innovators. As such, patient capital must be made available to these would-be capitalists to initiate their own businesses which could in turn benefit others.

Patient capital can also be used to increase the incomes of the poor sustainably. A case in point described by Friedman is the Kenyan company Advanced Bio-Extracts (ABE), a pharmaceutical company which produces an affordable, efficacious malaria treatment in a region where malaria still kills nearly a million Africans annually. ABE also designs contracts with small local farmers to grow the botanical ingredient for the drug, which helps them earn more income than just growing corn. This business model is funded using 'patient' capital from investors like Novartis and the Acumen Fund.

The Significance of 'Patient Capital' in Improving Global Health

In developing countries, health services rendered by the private sector are often costly and unattainable. As such, patient capital could be invested in social enterprises that provide high quality medical care at a low cost to the poor.

Brief Case Study: The Acumen Fund

"People don't want handouts...They want to make their own decisions, to solve their own problems." – Jacqueline Novogratz

A former graduate of Stanford Business School and subsequently an international banker, Jacqueline Novogratz is now a social entrepreneur who is redefining the practice of philanthropy by tapping into her business foresight and skills to fight poverty in developing countries. She believes that traditional charity, which merely gives aid, is no longer an adequate solution to the problem of poverty. Founding The Acumen Fund in 2001, Novogratz uses market-oriented approaches to tackle issues of poverty – by providing promising entrepreneurs, who bring the necessary good and services to communities who need them, with patient capital. Rather than distributing handouts like a traditional charity, The Acumen Fund invests in socially-conscientious companies whose target customers are the world's poor.

"From drip-irrigation systems in India to malaria-preventing bed nets in Tanzania to a low-cost mortgage program in Pakistan, Acumen's portfolio offers important case studies for entrepreneurial efforts aimed at the vastly underserved market of those making less than $4/day."

Social Investing and Social Return on Investment

According to Social Economy Scotland, social investment is a form of investment that is "focused on the social return rather than the financial return. It is a relatively new term but is gaining common currency describing the type of investment organizations are looking for as they move away from grant aid."

The Challenge: Procuring Social Investment

Because a social investor has to sacrifice financial return in favor of social return, the social investor arguably takes on more financial risk compared to the traditional investor. According to Brian Trelstad of Acumen Fund, a social investor is "someone who takes a double (or in some cases triple) bottom line approach to their capital, and attributes real value to the social or environmental return in their investment decision-making. They will often, but not always, be willing to exchange a lower economic return for potential social or environmental impact." So a fundamental challenge facing social entrepreneurs is to persuade investors, who normally invest in profit-oriented businesses, to invest in social ventures that not only do not promise significant returns, but are normally also highly susceptible to failure.

At the moment, there are no ready answers to this problem. In fact, there are many more challenges to come in terms of attracting investment into the social sector. Though the number of social investors continue to grow, it is unlikely to achieve a size large enough to meet all future social investment needs. Moreover, continued dependence on donor funding only leads to increased competition with other traditional nonprofits. Some have also suggested improving the profitability of social ventures by expanding their clientele to include the middle and upper classes, but this would arguably detract from the integrity of social entrepreneurship, which is supposed to serve the disadvantaged. Yet, without sufficient investment, a social venture's impact is limited because it cannot achieve significant scale.

Social Return on Investment (SROI) & Its Importance

According to Social Economy Scotland, "SROI measures an organisation's added value by calculating the social, environmental and economic benefits it creates and by attributing a financial value to them. It is based on standard accounting principles and investment appraisal techniques." It is a way of quantifying value creation. Like other investors, social investors, too, want to know if their investments are actually generating social returns. After all, just as economic profits justify the existence of businesses, so social returns justify the existence of nonprofits and social entrepreneurs.

But unlike other investors, social investors often have difficulty coming up with a precise, numerical value that can accurately represent the amount of social return produced. According to Sean Stannard-Stockton, the director of a wealth management firm,

"But what about the Social Return on Investment? If a donor makes a gift to a nonprofit, what is the "return" on that gift? How much "good" was achieved? The dollar amount given is easy, but "calculating" the "good" done is tough. First because knowing what "good" means is hard, secondly because relating "good" to dollars is like translating a symphony into organic chemistry, and third because identifying cause and effect is tough (did your grant create more jobs, or did the economy just happen to get better?)...I don't think we'll ever be able to honestly make statements like "My $10,000 donation achieved a 9.2% SROI". That would be like calculating that The Great Gatsby was a better investment of your time than Freakonomics."

Calculating the Social Return on Investment

Some entrepreneurs have provided technical guidelines in an attempt to measure the social return on investment. Jed Emerson, Jay Wachowicz and Suzi Chun from Harvard Business School propose an SROI analysis using the following methodology:

"Examines a social service activity over a given time frame (usually five to 10 years); calculates the amount of "investment" required to support that activity and analyzes the capital structure of the non-profit that is in place to support that activity; identifies the various cost savings, reductions in spending and related benefits that accrue as a result of that social service activity; monetizes those cost savings and

related benefits (that is to say, calculates the economic value of those costs in real dollar terms);discounts those savings back to the beginning of the investment timeframe (referred to as "Time Zero") using a net present value and/or discounted cash flow analysis; and then presents the Socio-Economic Value created during the investment time frame, expressing that value in terms of net present value and Social Return on Investment rates and ratios."

In presenting the above methodology, the authors also give a disclaimer: "The core SROI analysis, as presented by REDF, does not attempt to definitively quantify and capture all aspects of the benefits and value that accrue as a result of a successful program, but rather to identify direct, demonstrable cost savings or revenue contributions that result from that intervention." In other words, this is just one of many possible ways to calculate social return on investment, one based on cost savings and revenue contributions.

The Calvert Foundation has designed its own Social Return on Investment Calculator, based on the number of jobs created by the social venture. The diversity of methods of value appraisal attest to the difficulty of providing a standard, consistent way of Social Return on Investment analysis

The 'Invisible' Entrepreneurs

Social entrepreneurs from developing countries are seldom known. This is hardly because developing countries lack entrepreneurial talent; it is because many, especially those who have initiated entrepreneurial projects to lift themselves out of poverty, simply go unrecognized. The field of social entrepreneurship conventionally gives recognition only to MBAs and investment bankers, the elite group who have acquired specialized training in an institutional setting, but not to the poor and disenfranchised. It is time that they are recognized as legitimate practitioners of social entrepreneurship, and be given the necessary support and resources. No longer satisfied with just being the clientele of social ventures, the poor, too, want to participate actively in improving their own lives.

Social Entrepreneurship: A Survival Tactic for the Poor

"The true social entrepreneurs are ghosts that never claim the glory for themselves, that work for their goal like their lives depend on it, because actually, their lives do depend on it. They don't work to be counted. You don't find them in congresses, seminars and forums. They don't read literature about social entrepreneurship; they don't study it. They just are social entrepreneurs because they need to be. They live for it and by it." – John Alexis Guerra Gomez

For many of the poor, social entrepreneurship is a vocation of necessity, not of choice. In an effort to eke out a living, many rural poor have unknowingly become what Western academics term social entrepreneurs. These entrepreneurs have low or maybe even zero visibility in the field of social entrepreneurship because they do not actively engage in public relations, or they do not have resources like Internet access or even the necessary language skills to discuss their ideas. Yet, they are

contributing in significant ways to the betterment of their communities. Their social ventures may not achieve a scale significant enough to trigger a paradigm shift, as is conventionally the desired outcome of social entrepreneurship, but they nevertheless still have a huge impact on their immediate surroundings, especially on the poor people around them.

Contrary to popular belief, most poor people do not want to get by on charity; they want a sustainable way of making a living. Given the tools and resources, they too can become successful social entrepreneurs. But family always comes before community. Only when they can generate a consistent income to guarantee their own financial security, and their own families' economic stability, are they then willing to use their skills and resources to serve others in the community through their social ventures. "Individual ownership is the key to sustainable economic development," says Kickstart, a nonprofit that fights poverty.

Community Members as Social Entrepreneurs

It seems that most social ventures are initiated by foreigners who see a social problem and decide that something should be done. But local people cannot always rely on the initiative of foreigners. Instead, local people themselves must take the initiative to develop their own entrepreneurial plans of action in response to social problems. Moreover, they possess unsurpassed experience and knowledge of their immediate surroundings and needs, and therefore are in a good position to take action.

Moreover, a powerful synergy can be created by harnessing the entrepreneurial talent of local people to develop social ventures in collaboration with social entrepreneurs from developed countries who can provide the funding and other resources. Unite For Sight, for instance, depends on such a synergy for its success; it cultivates and invests in the talent of local ophthalmologist leaders who have the determination and skill to create social enterprises that serve their community's poorest people.

Karrus Hayes, a Liberian refugee and the founder of "Vision Awake" Africa For Development, is another example of a "local" social entrepreneur. The 1989-1997 Civil War in Liberia was a period of unimaginable turmoil. Fleeing for their lives, thousands of Liberians have now settled in refugee camps in neighboring countries. But the living conditions in these camps are often deplorable, and residents suffer from the effects of poor sanitation, polluted land, and contaminated water. In one such refugee camp, Bududuram Refugee Camp in ghana, Karrus Hayes realized that many children could not go to school. Seeing an unfilled education need, he decided to set up a free school. He had no money, but he had an entrepreneurial spirit. With a loan of $50 and some donated church space, he started the refugee camp's only tuition-free school for needy children. Today, his organization runs several programs, including a community college, microfinance and orphan assistance programs.

"It really touched me, but I didn't have control over it...I'm a refugee too. I don't have any means of helping. But I knew that I would do something because I had an idea." – Karrus Hayes

Supporting Local Entrepreneurial Talent

"To define people by their conditions rather than their abilities is dehumanizing. When you look past the poverty, you see abilities, resources, and desires. The poor are extremely hard-working and entrepreneurial – they must be just to survive. They don't want or need to be rescued. They want an opportunity to create a better life for their families."

It is clear that local entrepreneurial talent should be nurtured and developed. In order to do so, the field of social entrepreneurship must reach out to the "invisible" social entrepreneurs whose talent remains untapped. Ashni Mohnot has several ideas on how this could be done. In particular, she suggests that entrepreneurship conferences, like the Skoll World Forum, should encourage participation from these "invisible" social entrepreneurs in developing countries. More funding should also be made available locally to fund their social ventures.

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Course Name : Information Technology

Course Description

This Course is built on the previous acquired knowledge of Computer applications through theoretical lecturers and laboratory sessions. The course explores systems

development life cycle (SDLC), describing the data processing cycle, data processing, security issues & concerns in systems protection of its information, office automation, data base management system (DBMS)

Course Objectives

· To expose students to practical knowledge of developing information and database system for organizations and business firms.
· To enable understand how information and data is processed through an automated cycle.
· To help them develop skills in data entry and retrieval within different computer systems.

Course Content

Systems Development Life cycle (SDLC)

· Stages involved in the SDLC include; Problem identification, feasibility study, systems investigation, systems analysis, systems implementation, systems implementation, review and maintenance

Data Processing Cycle

· The input function
· The processing function
· The output function
· The storage function

Data processing operations

· Batch processing
· Real-time processing
· Features of a storage and retrieval system

Security issues/ concerns

· Risks to the computer users
· Risks to hardware
· Physical Access control
· Risks to storage media
· Risks to data
· Best password practice(BPP)
· Telecommunications dangers
· Encryption and other safety measures on telecommunication

Data Base Management systems (DBMS)

· Definition of DBMS
· DBMS structures
· Application program
· Elements of a DBMS
· Facilities offered by database management systems
· Benefits of a DBMS
· Designing a database
· Verification and validation checks

Office Automation
· Spread sheet
· Features of spread sheets
· Word processing
· Microsoft Access
· Internet

Mode of delivery Face to face lectures
Assessment
Coursework 40%
Exams 60%
Total Mark 100%

CHAPTER FIVE

SYSTEMS DEVELOPMENT LIFE CYCLE (SDLC)

5:0 INTRODUCTION

Under this Chapter we shall look at the following:
- Feasibility study
- Systems investigation
- Systems analysis
- Systems design
- Systems implementation
- Review and maintenance

A company or an organisation of any sort will normally have a strategic plan.
This strategic plan could be probably increasing sales by say 30% in the next 5 years.

When such a plan is in place, departments in the organisation will also set their strategies, to ensure that they contribute as required to the overall strategic plan. These departments may include; Production, Marketing, Sales, IT, Human Resource, etc.

Definition
A strategy is a general statement of a business's long-term objectives and goals and the ways by which these will be achieved.

5:1 THE IT STRATEGY

This will always deal with the organisational needs from IT, the organisation's current use of IT and the potential opportunities that IT can bring.
During the evaluation of current use of IT in the organisation, Gaps (differences) can be identified. E.g. does the system meet the desired requirements, are users happy, is the system reliable, etc.

5:2 STAGES IN THE SYSTEMS DEVELOPMENT LIFE CYCLE

This is the cycle that any system, which can be used in an organisation, can be developed through. It is called a cycle because the stages involved in the development will always be continuous and repeat themselves in the same way.

The stages involved in the systems development life cycle include the following in their order
- Problem identification
- Feasibility study
- Systems investigation

- Systems analysis
- Systems design
- Systems implementation
- Review and maintenance

Definition
A system is a collection of activities and elements organised to accomplish a goal.

A computer information system (CIS) is a collection of hardware, software, people procedures and data that work together to provide information essential to running an organisation.
Life cycle -This implies t hat the system changes continually, in other words that, development of computer information system within an organisation is an ongoing activity.

PROBLEM IDENTIFICATION
The SDLC typically begins by identifying a problem or need. It involves a preliminary investigation of a proposed project to determine the need for a new information system.

An end user usually requests this or manger who wants something done that is not presently being done.

The exact problem or flow in the system should be known e.g. slowness resulting in the incompetence of the system, too heavy work than is manageable effectively by the system and areas of poor performance being identified by management which increase the level of indirect expenses.

Possible plans or suggestions with alternative arrangements to the present ones are then forwarded to management in a report - to decide whether to pursue the project further.

If so then management hands the terms of reference to the system analyst. Once the analyst get a go ahead, he conducts a feasibility study within the limits of the terms of reference.

FEASIBILITY STUDY
This is a forma study to decide what type of system can be developed which meets the needs of the organisation.

It involves a brief review of the existing system and the identification of a range of possible alternative solutions.

The systems analyst here will estimate the costs and benefits of the systems with greater accuracy.
The alternative that promises a significant return on the investment will be accepted.

Feasibility study comprises the following:

♦Technical feasibility
♦Operational feasibility
♦Financial feasibility
♦ Economic feasibility
♦Social feasibility or organisational feasibility

1. Technical feasibility
The requirements, as defined in the feasibility study, must be technically achievable. This means that any proposed solution must be capable of being implemented using available hard ware, soft ware and other equipment.

2. Financial feasibility
The certified public accountant will have an in depth role to play at this stage in proceedings. The economic contribution of the whole system must be assessed.

At this level, the cost-benefit analysis will be carried out on all the possible alternatives, to identify the one with best returns.

There are three principal methods of evaluating a capital project

i) **Payback Period**
This method of investment appraisal calculates the length of time a project will take to recoup the initial investment - that is, how long a project will take to pay for itself. The method is based on cash flows.

ii) **Accounting Rate of Return**
This method, also called return on investment, calculates the profits that will be earned by a project and expresses this as a percentage of the capital invested in the project. The higher the rate of return, the higher a project is ranked. This method is based on
accounting results rather than cash flows.

iii) **Discounted Cash Flow (DCF)**
This method can be sub divided into two

♦**Net Present Value (NPV)**
This considers all relevant cash flows associated with a project over the whole of its life and adjusts those occurring in future years to 'present value' by discounting at a rate called the 'cost of capital'.

♦ **Internal rate of return (IRR)**
This involves comparing the rate of return expected from the project calculated On a discounted cash flow basis with the rate used as the cost of capital. Projects with an IRR higher than the cost of capital are worth undertaking.

3. Organisational feasibility
The culture of the organisation, its structure, working practices, behavioural patterns and social systems need to be considered.

After the outlined project specifications are prepared these are presented to users who, with the assistance of technical staff will evaluate each option and make a final choice.

The results of this are included in a feasibility report.

SYSTEMS INVESTIGATION

The systems investigation is a detailed fact finding exercise about the area under consideration.

The following will be considered here by the project team;

♦Determine the inputs, outputs, processing methods and volumes of the current system

♦Examining controls, staffing and costs and also reviews the organisational structure.

♦Also considers the expected growth of the organisation and its future requirements.

The stages involved in this phase of systems development are as follows:

a) Fact finding by means of questionnaires, interviews, observation, reading handbooks, manuals, organisational charts.
b) Fact recording using flow charts, decision tables, narrative descriptions, etc.
c) Evaluation, assessing the strengths and weaknesses of the existing system.

Methods used in obtaining facts about the existing system:

♦**Interviews**

If interviews are conducted effectively, they allow the interviewer to provide information as well as obtain it. This method is the most appropriate for senior management, as other approaches may not be appropriate at executive levels.

♦**Questionnaires**

The use of questionnaires may be useful whenever a limited amount of information is required from a large number of individuals, or where the organisation is decentralised with many 'separate entity' locations. Questions are normally set in such a way that each one is equal to another and the evaluation is done by simply adding the number of 'yes' and 'no'.

♦**Observation**

Here the investigator simply observes/watches the procedures as they occur. The problem here is that people normally tend to behave abnormally especially if they know that they are being watched.

♦**Document Review**

The systems analyst must investigate the document that are used in the system., e.g. organisational charts, procedures mammals and standard operational forms.

The overriding risk is that staff do not follow documented policies and procedure or that these documents have not been properly updated, so this method is best used within other techniques.

SYSTEM ANALYSIS

At this phase, a full documentation of the current system, oftenly using data flow diagrams is done. The ways in which the system can be changed to improve it are then considered, and diagrams are redrawn to reflect the required system.

Definition

A data flow diagram is a recording of the ways in which data is processed, without bothering with the equipment used.

SYSTEMS DESIGN

This involves the detailed systems specification draw up.
The selection of the suitable hardware, software and any required human - computer interface is done at this level.

Hard ware

In general terms, the choice of computer hardware will depend on the following factors:

♦User requirements - will the hardware suite in with the user's requirements.
♦Power - the computer power should be sufficient for the current and future requirements.
♦Reliability - there should be a low expected 'break down' rate. Back-up facilities should be available.
♦Simplicity - simple systems are probably best for small organisations.
♦Ease of communication - the system (hard ware and soft ware) should be able to communicate well with the user.
♦Flexibility - the hardware should be able to meet new requirements as they emerge, especially more powerful CPUs.
♦Cost - it must be affordable.

Soft ware

There are several points to consider while choosing a suitable package. They include the following:

♦**User requirements**

Does the package fit the user's particular requirements? E.g. report production, anticipated volume of data, etc.

♦Processing times

Is the processing times fast enough?

♦Documentation

The documentation should be full and clear to the user e.g. the manuals should easily be understood.

♦Controls - what controls are included in the package e.g. pass words, data validation checks, spell checks, etc.

♦Compatibility - will the package run on the user's computer?

♦Support and maintenance - what support and maintenance services will the software supplier provide?

♦User friendliness

Is the package easy to use? E.g. with means and clear on-screen prompts for the Key board operator.

♦Cost

Comparative costs of different packages should be a low priority. The company Should obtain what it needs for efficient operation. Off-the-shelf packages are a little cheaper that tailor made packages (bespoke).

A key question regarding software is whether to develop a system specially or buy what is already available (off-the-shelf)

Bespoke Packages

These are designed and written either 'in-house' by the IS department or externally by a software house. They are normally developed according to the customer specifications.

Off-the shelf packages

These are packages that are developed and sold to lots of users and intended to handle the most common user requirements.

Advantages of bespoke packages include:

i) The company owns the software and may be able to sell it to other potential users.
ii) The company can be able to do things with its software that competitors cannot do with theirs.
iii) It is likely that the package will be able to do all that is required it to do both now and in the future.

Disadvantages

a) The soft ware may not work at all.
b) There may be long delay before the soft ware is ready.
c) The cost is relatively high compared to off-the-shelf packages.

Advantages of using off-the shelf packages

a) It is available now and ready for use.
b) It is almost certainly cheaper than a specially commissioned product.
c) Expected high quality because software specialist writes them.
d) The software manufacturer will continually update a successful package, and so the version that a customer buys should be up-to-date.
e) Other users will have used the package already, and a well established package should be error-free.
f) These packages (good) are usually well-documented with easy to follow user manuals.

Disadvantages

a) A computer user gets a standardised solution to a data processing task. This may not well suite in the individual user's particular needs.
b) The user is dependent on the supplier for maintenance of the package.

c) There is always no competitive advantage as the competitors can use the same package.

Systems prototypes are likely to be developed here.

Definition
A prototype is a diagrammatic representation of the actual proposed system. It includes the number of hardware required, its configuration, information flow, staff, etc.

SYSTEMS INSTALLATION AND IMPLEMENTATION

Under this phase, the following stages are normally followed;

a) Installation of hardware and software
b) Testing
c) Staff training and production of documentation
d) Conversion of files and database creation
e) Change over

The items/stages in the list above do not necessarily happen in a set chronological order, and some can be done at the same time - for example staff training and system testing can be part of the same operation.

Installation of equipment
Installing a mainframe computer or a large network is a major operation that is carried out by the manufacturer/supplier.

Installation of a PC and other peripheral equipment will need a little bit of planning.

♦They should not be put in small, hot rooms since they generate some heat.
♦Large desks may be advisable, to accommodate a screen and keyboard and leave some free desk space for the officer worker to use.
♦There should be plenty of power sockets-enough to meet future needs as t he system grows, not just immediate needs.
♦If noisy printers are being purchased, it may be advisable to locate these in a separate printer room to cut down the noise for office workers.
♦There should be a telephone near the computer, for communicating with the dealer that provides systems support and advice if there is a problem.
♦The cabling for network connections should consider possible future changes in office key out or in system requirements.

After the installation of hardware, then software can be installed too. The can be done very fast there days since software is available on CD-ROMs and DVDs.

Back up copies of the software may also be got.

Testing
Programs must be thoroughly tested as they are being written and the whole system should also be thoroughly checked before implementation, otherwise there is a danger that the new system will go live with faults that might prove costly.
'Test data' is normally used here.
Test data is fed into the computer/new system and the results from the new system are compared with the already existing/pre-determined results from the old system.
Any deviations can be used to make decisions as to whether the system has passed or failed the test.

Training and documentation
Staff training in the use of information technology is as important as the technology itself. There is no use in having it if people don't know hoe to use it. This can be done through, lectures, discussion meetings, handbooks, trials/tests, internal company magazines, courses, manuals, etc.

Conversion of files
This means converting existing files into a format suitable for the new system.
Large organisations may use conversion software to change over:

Once the new system has been fully and satisfactorily tested, the change over can be made. This may be according to one of four approaches.
- Direct change over
- Parallel running
- Pilot tests
- 'Phased' or 'Stayed' implementation

Direct change over
This is the method of changeover in which the old system is completely replaced by the new system in one move.

This may be unavoidable where the two systems are substantially different, or where extra staff to over seed parallel running are unobtainable.

It is very cheap, but very risky as well and it is best used in business slack periods e.g. Christmas, holidays, etc.

Parallel running
This is a form of changeover where by the old and new systems are run in parallel for a period of time, both processing current data and enabling cross checking to be done.

It is a bit safe (less risky), but if the two systems are different, then cross-checking may be hard or impossible. Also, there is a delay in the cultural implementation of the new system and also a need for more staff to run the two system - an indication of high expenses.

Pilot Operation
This may involve a complete logical part of the whole system being chosen and run as a unit on the new system. If that is shown to be working well, the remaining parts are then transferred.

Gradually the whole system can be transferred in this piece meal fashion.
This method is cheaper and easier to control than parallel running, and provides a greater degree of safety than does a direct change over.

Phased Implementation
This involves a parallel running or direct change over done to a system of a particular section, say a branch of a company.

This method is suitable for very large projects and/or those where distinct parts of the system are geographically dispersed.

At this phase/stage (systems installation) of the SDLC, the internal auditors role is usually very important, especially during the testing of the new system.

This is because the facts he obtains at the testing stage can be used in future evaluation of the system and any audits that may be carried out.

A reference can always be made to the facts generated by the auditor at the testing stage to ensure there are no illegal amendments to the system.

SYSTEMS MAINTENANCE AND REVIEW

Maintenance
This is geared towards keeping the system running smoothly and achieving the intended goals.

There are three types of maintenance activities,
♦Corrective maintenance
♦ Perfective maintenance
♦Adaptive maintenance

Corrective maintenance
Is carried out when there is a systems failure of some kind, for example in processing or in an implementation procedure. Its objective is to ensure that systems remain operational.

Perfective maintenance
Is carried out in order to perfect the software, or to improve software so that the processing inefficiencies are eliminated and performance is enhanced.

Adaptive maintenance

Is carried out to take account of anticipated changes in the processing environment. E.g. the new taxation legislation might require change to be made to payroll software.

Post Implementation Review

This is devoted to uncovering problems in the system so as they can be fine tuned. Also it reviews t he activities involving methods used in developing the system. It is of two steps:

♦**Development review**

Here the problems that arose during the development phases of the life cycle are analysed. Major discussions focus on expenditure and the period taken to complete the new system. Positive or negative variances in the expenditures are analysed. Mistakes resulting to negative variances are noted and are unlikely to be repeated in the future like wise positive variances.

Also mistakes that led to the delay are noted and avoided in the future.

♦**Implementation Review**

This step investigates the specific successes and problems of system operations. These activities take some time after systems implementation say 1½ years. It is intended to ensure that the system meets the desired goals it was implemented for.

In summary still, the systems development life cycle follows these stages and it is very examinable.

1. Problem identification
2. Feasibility study
3. Systems investigation - detailed
4. Systems analysis
5. Systems design
6. Systems implementation
7. Systems maintenance and review

Question:

a) In the SDLC, which stage go you think directly involves a certified public accountant like you, and what would you be required for?
b) Describe for methods of system change over.
c) Distinguish between off-the shelf and bespoke software.
d) What is feasibility study?

CHAPTER SIX

THE DATA PROCESSING CYCLE

6:0 INTRODUCTION

Under this Chapter we shall look at the following:

- ♦Processing cycle
- ♦ Processing operations
- ♦Storage and retrieval systems
- ♦Classification of files

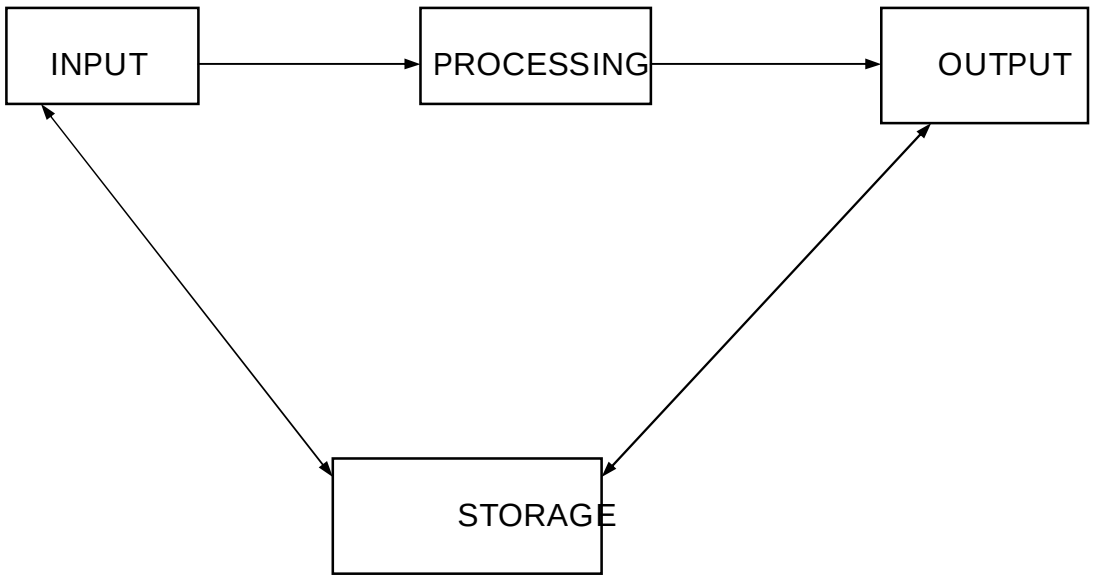
6:1 DATA PROCESSING CYCLE

Data processing, whether it is done manually or by computer, follows a cycle of input, process, output and storage.

Data processing is the acquisition, arrangement, storage and maintenance of data. The use of the computer is just to speed up and allow the use of complicated models compared to other methods.

A cycle refers to a sequence of activities performed in order, that produces expected dependable results.

The DP Cycle



The input function;

This involves gathering/collecting needed data items and entering the items into the information system for processing. This is done by the computer input devices.

Inputs can come from multiple sources. The quality, accuracy and completeness of data will affect the quality of the resulting information.

The processing function
This involves any method for using, handling, processing operations transforms transform data into meaningful information.

Processing creates new information which in turn is returned to files for updating and, or communicated to people.

The output information
Output delivers the results of processing i.e. information which can in turn be communicated to the people known as users of computers or information. This is normally done by the output devices.

The storage information
An information system needs a massive supply of data records and files. In this sense, storage is a vital part of an information system. The storage function also involves updating files to incorporate processed data. Storage can be done into the various types of storage peripherals that you already know.

6:2 DATA PROCESSING OPERATIONS

Files are used to store data and information that will be needed again in future or for the current use.
A file is a collection of records with similar characteristics.

The main types of data processing operations involving files are file updating, file maintenance and file enquiry or file interrogation.

Both manual and computer data processing can be divided into two broad types:
- ♦Batch processing
- ♦Real-time processing

Batch Processing
This is the processing as a group of a number of transactions of a similar kind which have been entered over a period of time to a computer system. Data is entered first, and then gets processed at a go as a group.

E.g. you may enter all the names into the system and then command it to arrange them in alphabetical order.

Transaction is any updating work on a database file. This can include entry of a new record, amending a record, deleting a record, etc.

Real-time processing
This is the continual receiving and rapid processing of data so as to be able or more less instantly to feed back the results of that input to the source of the data.

Real-time processing uses an 'on-line' computer system to interrogate or update files as requested rather than batching such requests together for subsequent processing.

On-line

On-line refers to a machine, which is under the direct control of the principal central processor for that hardware configuration.

Modern computers such as PCs are on-line by definition and likewise PCs in a network have permanent access to the server.

6:3 FEATURES OF A STORAGE AND RETRIEVAL SYSTEM

Whatever form documents and recorded information take, if they are to be of any use, they must be kept in a suitable way so that:

a) Authorised people can get to the information they require quickly and easily;
b) Information can be added to, updated and deleted as necessary;
c) Information is safe from fire loss or handling damage as long as it is required;
d) Accessibility, flexibility and security are achieved as cheaply as possible.

Classification of Files

Accessibility is a key point. When information is filed, it has to be filed in such a way that its users know where it is and how to retrieve it later when it is needed.

This means having different files for different types of information, and then holding each file in a particular order. Information might be divided into categories and then held in a particular order within each category.

There are various ways in which information can be grouped together, or classified.

a) By name (for example correspondence relating to a particular person)
b) By geography (for example all documents relating to a particular country, area or city).
c) By subject matter (for example all document relating to a particular contract, transaction or problem).
d) By date (for example all invoices for a certain month or year).
e) By department (for example profits or costs for each department or employee of each department).

Once broad classifications are established, the material can be put into a sequence which will make individual items easier to retrieve.

Again there are various systems for arranging files

a) Alphabetical order - for example customers listed in name order
b) Numerical order - for example invoices listed in numerical order of invoice numbers.
c) Alpha-numerical (A1, A2, A3, B1, B2, and so on).
d) Chronological order -f or example letters within a subject file listed by the date they were written.

SECURITY ISSUES

7:0 INTRODUCTION

Under this topic we shall look at the following,

- ♦Risks to the computer user
- ♦Risks to hardware
- ♦Physical access control
- ♦Controls over personnel
- ♦Risks to storage media
- ♦Risks to data
- ♦Back-up procedures
- ♦Telecommunication risks

A computer system consists not only of hardware, software, data and procedures but also of people.

Because of people, computer systems may be used for both good and bad purposes.

7:1 RISKS TO THE COMPUTER USER

If you have ever worked for long periods at a computer, you may have experienced some discomfort. This might have been caused by your use of the screen or the keyboard.

The VDU

If the screen is too bright, it can cause eyestrain. There are two ways of dealing with the problem. The first is to turn down the brightness; all monitors have a brightness and a contrast switch.
The second is to fit some kind of anti glare filter. All VDUs must have a swivel and tilt capability.

The physical health matters related to computer that have received the most attention recently are the following:-

1. Eye strain and headache

VDUs require using the eyes at close range for a long time, this can create eye strain, headaches and double vision.

And this is normally when the screen is too bright. To avoid this, take a 15 minute break every hour or two. Turn the brightness down.

Use of special anti-glare screen coatings and glare filters. Keep everything
You are
focusing on at about the same distance e.g. the screen, key board, document holder containing your work.

Clean the screen of dust from time to time.

2. Back on neck pain

Many people work at VDU screens and key boards that are in improper positions

resulting in back and neck pain.

To avoid such problems;

♦Make sure the equipment is adjustable. Your chair should be adjustable for height and angle and should have good back support.
♦The table on which the monitor stands should be adjustable.
♦The monitor should be detachable.
♦ Document holders should be adjustable.

3. Electro magnetic fields effects

Like many household appliances, VDUs generate invisible electro magnetic fields (EMF) emissions which can pass through the human body.

Recommendations include;

♦Use of low emission monitors.
♦Computer users should sit 2 feet or more from screens and at least 3 feet from neighbouring terminals, as the strongest fields are emitted from the sides and back sides of terminals.
♦Use of glare filters which also reduce the emissions getting to an individual from the screen.

Repetitive Strain Injury (RSI)

Data entry operators in some companies may make as many keystrokes a day as possible. Some have fallen victim to a disorder known as RSI. This name is given to this disorder, which results from fast repetitive work that can cause neck, wrist, hand and arm pains.

Avoidance of RSI includes;

♦Taking short rest breaks
♦Getting plenty of sleep and exercise
♦Loosing weight, sitting straight
♦ Learning stress management techniques

Other computer health risks include:
♦Injury from electric shock

7:2 RISKS TO HARDWARE

Threats to hardware security are computer crimes including virus, electronic break-ins and natural, etc. Keeping information private in part depends on keeping computer systems safe from criminal acts, natural hazards and other threats.

Physical Threats

Fire and Flood

Fire is the most serious hazard to computer systems. Destruction of data can be even more costly than the destruction of hardware.

A fire safety plan is an essential feature of security procedures. It includes;

♦Site preparation - appropriate building materials, fire doors, etc.
♦Detection - e.g. smoke detectors
♦Extinguishing - e.g. sprinklers
♦Training staff in observing fire safety procedures e.g. the smoking in computer rooms

Water is a serious hazard. Flooding and water damage are often encountered following fire fighting activities else where in a building.

This problem can be countered by water proof ceiling and floors together with provision of adequate drainage. In some areas, floods are a natural hazards and therefore basements are generally not regarded as appropriate sites for computers.

Weather
The weather may be a threat. Wind, rain and storms can all cause substantial damage to buildings. Lightning and electrical storms pose an additional threat, as they can play havoc with power supply, causing power failures and power surges.

One way of combating this is by the use of un interrupted (protected) power supplies (UPS) Power failure may be solved by obtaining a separate generator.

Theft
Office break-ins are common. This can be combated by use of burglar proof windows and doors, etc.

7:3 PHYSICAL ACCESS CONTROL
The way to minimise many of the risks discussed in the above section is to introduce a series of physical access controls, to prevent intruders getting near the computer equipment or storage media. Methods of controlling human access include:

♦ Personnel (Security guards)
♦Mechanical devices (e.g. keys, whose issues is recorded)
♦Electronic identification devices (e.g. card-swipe systems, where a card is passed through a reader.

Personal identification numbers (PINs)
In some systems, the user might have a special PIN, which identifies him or her to the system. According to what the user's PIN is, the user will be allowed access to certain data and parts of the system but forbidden access to other parts.

Door locks
Connectional door locks are of value in certain circumstances, particularly where users are only required to pass through the door a couple of times a day. If the number of people using the door increases and the frequency of use is high, it will be difficult to persuade staff to lock the door every time they pass through it.

The major difficulty with this is the fact of key control. And the solution would be installing a combination door lock. This is where a numbered keypad is located outside the door and access allowed only after the correct 'code', or sequence of digits has been entered.

This will be effective if users keep the combination secret and the combination is changed frequently.

Card Entry Systems
This is a more sophisticated means of control than the use of locks, as cards can be programmed to allow access to certain parts of a building only, between certain times.

Security guards
These can be deployed at each entrance in the building to restrict access as may be required.

Video Surveillance
These (video cameras) are normally placed in certain strategic areas say corners, corridors, inside the rooms, etc. to cover any moving object. They are normally connected to a certain surveillance room of several TVs and a person to see the moving objects on TV.

7:4 CONTROL OVER PERSONNEL

Personnel Selection
The personnel who are to operate in the IT departments need to be fully scrutinised at the recruitment state and after recruitment, they need to be managed properly.

Controls related to personnel include the following:
i) Checks and balances so that a security violation must pass through several steps before being implemented.
ii) Segregation of duties (division of responsibilities)
iii)Job rotation so that employees change jobs at random intervals.
iv) Enforced vocations
v) Access to information granted not on rank in the management hierarchy or precedent, but on a need-to-know basis.
vi)Careful selection of personnel especially those to work in the IT departments.

Fraud
Computer frauds come from disgruntled employees, organised crime and hackers.
Networks make certain types of fraud easier; this is because many people/employees can have access to the computer system.

Two types of fraud can be identified

i)Single large-scale funds - usually the stealing of large amounts of money.
ii)Small-scale, but long-term frauds.

Examples of methods of fraud are given below:
i) Creation of fictitious supplier accounts and submission of false invoices, usually for services rather than goods, so that payments are sent to the fictitious supplier.
ii) Corruption and bribery, particularly where individuals are in a position of authority as regards making decisions or suppliers or selecting between tenders.
iii) Misappropriation of incoming cheques from bonafide customers.
iv) Theft of portable fixed assets.
v) Giving unauthorised discounts to customers.
i) Fictitious staff on the pay roll.

These frauds do not all involve computers in the commission, but many could be detected by appropriate use of computer controls, perusal of exception reports, analysis of expenditure ratios and the like.

7:5 RISKS TO STORAGE MEDIA

Handling floppy disks, CDs and tapes

Floppy disks and CDs should be handled with care just as you would treat a valuable CD with care.

i)They break when you bend them or you run them over with the castors of your chair.
ii) Spilling hot drinks over them and leaving them on sunny windows sills will damage them.
i) CDs should particularly be protected from dust, scratches and finger prints.
ii) For floppies write on the label before you stick it on to the disk and write only with a felt tip pen, never a ball point.
iii) Floppies are affected by magnets sot hey should be kept far from magnets.

Tapes can be snipped with scissors, or get knotted up, and they can also be damaged by magnets and heat and liquid. Treat them with the same care you would give to your favourite audio/video tape.

7:6 RISKS TO DATA

Risks to data can be in the form of deliberate or accidental:
i))Destruction (or alteration)
ii)Theft
iii) Unauthorised disclosure

There are therefore two types of controls used to restrict access.

♦Physical access controls (analysed earlier)
♦Logical access control

Basically logical access control consists of a password system. Data destruction can be protected against by taking back-ups and the risk of alteration of data minimised by a variety of basic precautions.

Passwords
Passwords are a set of characters, which may be allocated to a person, a terminal or a facility, which are required to be keyed into the system before further access is permitted.

Passwords can be applied to data files, program files and parts of a program.

i) One password may be required to read a file, but another to write new data to it.
ii) The terminal user can be restricted to the use of certain files and programs
(e.g. in a banking system, junior grades of staff are only allowed to access certain routine programs).

In order to access a system the user needs first to enter a string of characters. If what is entered matches a password issued to an authorised user or valid for that particular terminal the system permits access. Otherwise the system shuts down and may record the attempted unauthorised access.

Disadvantages of passwords

i)By experimenting with possible passwords, an unauthorised person can gain access to a program or file by guessing the correct passwords. This can usually be easy especially where users pick on to use obvious password like their names, etc.
ii) Some one authorised to access a data or program file may fell an unauthorised person what the password is, perhaps through carelessness.
iii)Many password systems come with standard passwords as part of the system. It is always better not to use such standard systems.
i) Passwords can be left in the open and any one gains access to them.

7:7 BEST PASSWORD PRACTICE (BPP)
These are points that have to be observed by computer users to whom passwords have been allocated.

- Keep your password secret - don't reveal it to anyone.
- Do not write it down as any body may come across it.
- Change your password regularly.
- Change and use your password discretely - some body can watch the movement of fingers to determine the password.
- Do not use obvious pass words e.g. your name, etc.
- Change your password if you suspect that any one else knows it.

7:8 TELECOMMUNICATIONS DANGERS

When data is transmitted over a network or telecommunications link (especially the internet) there are numerous security dangers.

a) i)Corruptions such as viruses on or single computer can spread through the network to all of the organisation's computers.

b) Staff can do damage through their own computer to data stored on other computers. E.g. transferring a file of the same name to the colleague's which may cause an over write.
c) Disaffected employees have much greater potential to do deliberate damage to valuable corporate data or systems.
d) If the organisation is linked to an external network, persons outside the company (hackers) may be able to get into the company's internal network, either to steal data, or to damage the system.
   Systems can have firewalls - these are used to prevent a particular network from intrusion from any other network e.g. a company network and the Internet.
e) Employees may down load inaccurate information or imperfect or virus-ridden software from an external network.
f) Information transmitted from one part of an organisation to another may be intercepted.
   Data can be encrypted (scrambled) in an attempt to make it meaning less to those who are not entitled for it.
g) The communications link it self may break down or distort data.

Encryption and other safety measures on telecommunication

♦Encryption involves scrambling the data at one end of the line, transmitting the scrambled data, and unscrambling it at the receivers end to the line.

Authentication

This involves adding an extra field to a record, with the contents of this field Derived from the remainder of the record by applying an algorithm that has previously been agreed between the senders and recipients of data.

Dial-back security

This operates by requiring the person wanting access to the network to dial into it and identify themselves first. The system then dials the person back on their authorised number before allowing them access.

Hacking

A hacker is a person who attempts to invade the privacy of a system. There are normally skilled programmers, and have been known to crack system passwords with consummate ease.

CHAPTER EIGHT

DATA BASE MANAGEMENT SYSTEMS

8:0 INTRODUCTION

Under this Chapter we shall look at the following:
- Data base management system (DBMS) structures
- Designing a data base
- Verification and validation checks

8:1 DBMS STRUCTURES

Data within databases (or most other computerised filing systems) is organised in a specific hierarchy. The aim of the organisation method is to provide generally accepted and workable method of storing and accessing data in computer files. The basic concepts to be understood are as follows.

- **Database** -stores information about the organisation within individual files
- **File** - information concerning one aspect of the organisation, such as details of debtors.
- **Record** - all the detailed information about one person or item within a file. E.g. in a debtors file, there will be information about the debtor.
- **Field** - one item of data e.g. within the debtor's record this could be the debtor name.
- **Byte** - one character
- **Bit** - the smallest unit of computer storage - one area of memory, which can hold the value 0 or 1.
- **Entry set/type** – Group of similar objects of concern to an organisation for which it maintains data transactions, courses, employees, students, non academic staff etc.

Meta data – is data used to define other data

Attributes – Characteristics of object category.
Entity- Basic units used in modelling.
Modelling – Some basic common functions.
Database – Collection of related files
Key - Single attribute
Primary key – unique entity identifier
Supper Key – Additional attributes to a primary key
Candidate Key – 2 or more attributes uniquely identifying an entity set
Secondary Key- An attributes/combination of attributes that may not be candidate keys but classifies the entity set
Meta data – Using data to describe/define data
External View of data – Highest level of application
Global view of data – lowest level of actual data storage

Naïve user

♦Not aware of DB (Database systems)
♦Responds by processing a coded Key
♦Then operations are very limited

On-Line User

♦Communicate with database directly via a user interface and application programme
♦Aware of database system (DBS)
♦Use data manipulation language
♦Need additional help like merits
There are three basic database structures having different levels of sophistication hierarchical databases, network databases and relational databases.

As hierarchical and network data bases are rare these days, we shall confine on describing the relational model.

Relations Database
The concepts behind relational databases were developed by EF Codd of IBM.

The data is stored in tables, which are derived by a mathematical form of analysis on the sources of data for the system e.g. input screens, reports.
In a relational database, data is split between different two-dimensional tables, which are linked together via a set of unique keys

Commercially available relational databases include IBM's DB2 and Oracle. Ms Access is also a relational database.

APPLICATION PROGRAMME.
♦Are professional programmers
♦Develop application programme user interface utilised by
♦The naïve & online users
♦Are programme written in general purpose programming language e.g. Assembler, COBOL, Fortran, Pascal etc.

DATA BASE MANAGEMENT SYSTEMS

Definition:
A database is a file (or files) of data so structured that many applications can use the file and update it, but which do not themselves constrain the file design or its contents.

This is of major benefits to the organisation including data sharing between applications.

DBMS

This is specialist software used to create and maintain a database.

Organisations collect and use vast amounts of data. One method of storing and accessing this data is to place it within one large store and use a DBMS to effectively control that data.

The DBMS is normally located between the main database of the organisation and the different applications that want to access and use that data.

Elements of a DBMS
A DBMS comprises three separate sections i.e.

a) Data Definition Language (DDL)
b) Data Manipulation Language (DML)
c) Data Dictionary

DDL is used to specify the content and structure of the database. The DDL defines the form of each item of data in the database so that the data can be accessed and used by the various application programs accessing the database.
Entry set/Type – Group of similar objects of concerned to an organisation for which it maintains e.g. data transactions, courses, employee, students, non-academic staff etc.

♦Defines the conceptual scheme
♦Curves details how to implement the conceptual scheme and stores data

DML is a specialist language used to manipulate data within the database. The DML is a fourth generation language.
♦Involves retrieval of data from the database
♦Inserts raw data into the database

The Data Dictionary is a program used to store and organise the data in the database. The dictionary stores key information about the data, such as who uses the data, what the access rights to data are and who owns the data and is therefore responsible for updating it. Deletes and modifies existing data.

Facilities offered by database management systems

The DBMS will offer the following facilities:
a) The ability to add, amend and delete records
b) The ability to retrieve data
c) The ability to present data in different formats and combinations as required
d) The ability to control access to records by means of passwords and other security procedures
e) The ability to allow the database to evolve without requiring modification to applications programs
f) The ability to recover from systems break down and avoid data loss
g) The ability to record transactions and identify redundant data.

8:2 DATABASE ADMINISTRATORS (DBA)

Centralised control of data base under one controller that is sole administrator.
The DBA's work can be split into strategic and organisational activities.

a) Strategic Tasks

(i) Working with strategic management to help define the organisation's present and future needs.
(ii) Choosing suitable file structure for data storage.
(iii) Analysing the data required for each application.
(iv) Preparation of a data model.
(v) Preparation, modifying and maintenance of a data dictionary.
(vi) Defining hardware needs and plan for any change and internal levels.
(vii) Administrator of internal and external view of data (3 levels)
(viii) Specifies conceptual view of various users and applications
(ix) Defines and implements the internal level and storage structure
(x) Controls changes to external Global
(xi) Custodian and controller of database structure
(xii) Defines mapping between levels structures
(xiii) Okays users of the database and their dismissal.
(xiv) Fore sees the maintenance and preservation of the integrity of the database
(xv) Defines procedures to receive and recover the database system

b) Organisational Tasks

(i) Ensuring data integrity by implementing and controlling database procedures.
(ii) Production of operating manuals.
(iii) Provision of training for users and applications programmers on a regular basis.
(iv) Assessing the ongoing performance of the database.

Benefits/advantage of database filing systems

There are basically three major benefits from database filing system; i.e. integrity, independence and integration.

Integrity

Database integrity means that data is kept secure and that amendments are only made as effectively authorised by the DBMS.

Independence

The principle of independence relates the splitting of data away fro the programs that use that data.

Making this split ensures that;

- Applications can be written and amended independently of the data they use, and
- Amendments can be made to the data without having to amend all the different applications that use the data.

Integration

This refers to the maintenance of data in one location rather than spreading and possibly duplicating, that data around the organisation in separate individual databases.

8:3 BENEFITS OF A DATABASE MANAGEMENT SYSTEM (DBMS)

a) Integration of data needs
Data should be shared between the different applications using it. This can mean That different applications using the DBMS can access the same data at the same time.

b) Data security
Data should be accessible only to those authorised to see it, and should be capable of modification only under controlled conditions.

c) Flexibility
The DBMS should allow for different uses with a range of applications.

d) Minimum redundancy
Duplication of data should be kept to a minimum. This achieves the benefit of reduced space and avoids inconsistent data.

e) Evolutionary capability
The DBMS must be capable of evolving to adapt to changing organisational Needs without requiring extensive modifications to application programs.

8:4 DESIGNING A DATABASE

Where an organisation uses a central database, it is crucial that the database operates effectively. This requires adequate hard ware, software and personnel, but most importantly it needs a well-designed database.

The main stages in design and use of a database are as follows;
a) Analysis of information needs
b) Logical design of the database
c) Physical design and set up of the data base
d) Data entry and upkeep
e) Data retrieval and reporting
f) Monitoring and maintenance

Analysis of information needs

In order to identify the information needs of the organisation, a fundamental understanding of its objectives is necessary.

a) The business plans of the company provide the basis of this understanding, identifying the organisation's critical success factors (CFS) and the information that is needed for these factors to be achieved.
b) An information audit will be carried out to identify the needs of particular users and groups of users.

Logical design of the database

a) The information gathering process will help to determine the data required on the database for existing and foreseeable future applications. This list of data is recorded in the data dictionary.

b) The rules relating different items of data together are determined.
c) The analyst will then determine the rules relating particular application to items in the database.

Physical design and set up of the organisation
The rules that have been specified are then programmed to support the database management system. This procedure is so specialised that it may require a special Data Description Language (DDL).

Data entry and upkeep
a) Data is added (or appended) to the database. Its integrity is ensured by validation and verification checks.
b) Existing data may be changed (or amended). This process will also be subject to validation and verification (see later in next section).
c) Existing data may be deleted from the database. This is normally a two-stage process, i.e. making and then physically deleting - this ensures that only intended data is deleted.
d) A specialised language called a Data Manipulation Language (DML) may be used to carry out the processes of addition, amendment and deletion.

Data Retrieval and Reporting
Most database systems provide a wide variety of ways in which data may be accessed and analysed.

a) Individual records may be retrieved and inspected.
b) Items may be retrieved according to a set of specific parameters.
c) Data may be sorted or indexed on any field or combination of fields. This makes lists and other outputs easier to use.
d) Simple summarises and calculations can be carried out on the data contained in the database.
e) Report generators are supplied with many databases management packages. This enables users to summarise and report data quickly and in an easily digested format.
f) A specialised language called a Structured Query Language or SQL may be used to retrieval and report information.

8:5 VERIFICATION AND VALIDATION CHECKS
The verification and validation checks have been designed to deal with the common human errors as regards data entry. This is in databases, accounting systems, spreadsheets, etc. So this means that these checks do not only apply to databases but also to accounting systems, word processors, spreadsheets, etc.

Verification is the process of ensuring that the data that has been input is the same as the data on the source document.

Validation is the process of ensuring that the data that has been input has a value that is possible for that kind of data. For example there is no month with 33 days.

Data Verification

The most common method of verification is encouraging staff to look for errors e.g. if data is input using a key board, it will be shown on the screen and visual checks on the data can be made.

Validation Checks

When a validation check identifies an error, the record concerned will probably be rejected and processed no further without correction. Rejection reports or massages will be displayed on a VDU screen.

Some of the data validation checks are outlined below:

♦**Range Checks**

These are designed to ensure that the data in a certain record field lies within predetermined limits e.g. day of a month can be from 1 to 31 not 0 or beyond 31.

♦**Limit Checks**

These check that data is not above or below a certain value.

♦**Existence Checks**

These are checks to ensure that the data is valid within a particular system. E.g. Checking items in stock.

♦**Format Checks**

These help to ensure that the format (and size) of the data in a field is correct. E.g. check that the formal is all numeric or alphabetic, etc.

♦**Consistency checks**

These involves checking that data in one field is consistent with data in another field. For example, in a payroll system, there might be a check that if the employee is a Grade C worker, he or she must belong to department 5,6 or 9.

♦**Completeness Checks**

A check can be made to ensure that all records have been processed.

♦**Check digits**

This check is used to detect especially transposition errors.

Transposition errors are those that arise when correct digits in a figure, e.g. 123,907, are unintentionary interchanged, e.g. 132, 907.

CHAPTER NINE

OFFICE AUTOMATION

9:0 INTRODUCTION

Under this Chapter we shall look at the following:

- ♦Spreadsheet
- ♦Word Processing, DTP and Graphics
- ♦Communication
- ♦The Internet

Office automation tries to analyse the application programs that are normally used in offices and office communication.

9:1 SPREAD SHEET

A spreadsheet is a general-purpose software package for modelling. The name is derived from its likeness to a spreadsheet of paper divided into rows and columns.

♦A spreadsheet program can help you manage personal and business cash flow analysis and forecasting. General ledger, stock records, profit projections, sales projections, etc.

♦You can use the spreadsheet to perform calculations, analyse data and present information.

♦You can store large collections of information i.e. a mailing or product list.

♦Spreadsheets program include tools for organising, managing, storing and retrieving data-through a bigger control over a list stored on your computer would need a Database program.

Features of Spreadsheets

Cell is one box in a spreadsheet.

Column is a vertical line of boxes or cells. Each column is identified by a unique letter e.g. a,b,c, aa, ab, aaa, aab, etc).

Row is a horizontal lie of boxes of cells. Each row is identified by a different number (e.g. 1,2,3,11,12,13,111,112, etc).

Active cell (Current cell)

This identifies the location of each cell in a spreadsheet. It consists of a column letter followed by a row number.

Formula

In a spreadsheet, a formula helps you calculate and analyse data. When entering formulas cell references or cell addresses are used. E.g. [+D2+D4] instead of typing in the actual data whenever possible.

Calculations

Spreadsheet programs perform calculations using the following.

* - multiply, + - Add, - - Subtract, /- divide, / exponents.

Automatic Recalculation
Spreadsheets have a facility where by if you change a number used in a formula, all the other figures affected by the formula will change automatically displaying the new results.

This feature is so useful if you want to evaluate possible scenarios. E.g. how differently interest rates affect your mortgage payments.

Using parenthesis [ ]
In a formula, a spreadsheet program will calculate the data inside the parentheses then with those outside it. E .g. +A1 * [B6/B7] + A5.

Copying a Formula
After entering a formula in a spreadsheet, you can save time by copying a formula to other cells. The spreadsheet program will automatically change the cell references in the new formula for you.

Functions
A function is a ready-to-use formula that helps you to perform calculations e.g. sum, Average, Maximum, Minimum, etc.

Examples:
♦SUM [D1: D4] calculates the sum of the numbers in addresses D1 to D4.
♦AVERAGE [A6: A10] calculates the average value of the lists of numbers in addresses A6 to A10.
♦MAXIMUM[A2; A7] finds the largest value in the lists of numbers in addresses A2 to A7.

Facilities offered by a spreadsheet.

Editing
Data can easily be copied for moved from one part of the spread sheet to another using a mouse and cut and paste or drag and drop facilities.

♦Column width, row height can also be changed.
♦Rows and columns can be inserted and most operations can be reversed.

♦Modern spreadsheets can help you complete a series, e.g. type ‘Monday’ - it will type the rest up to Sunday.

Formatting a Spread sheet
This involves changing font (type style), number appearance, boarders, shading and colour. Data alignment centre left or right, etc. You can format the entire spreadsheet or a specified range of cells.

Charts and graphics

Most spreadsheets contain graphic and chart facilities which enable you illustrate data using a suitable chart type.

Sorting
Data can be sorted alphabetically or numerically.

File commands
Opening, naming, saving, printing and closing the spreadsheet file are the key tasks.

Potential problems/disadvantages of spreadsheets

Spreadsheets are immensely popular and can be used for a very wide range of modelling tasks. However, because they are essentially single - user packages and because each one is designed from scratch. There are risks in their use.

a) Although users are some times trained in how to use a spread sheet, they are rarely trained in spread sheet discipline or best practice. This means that spread sheets may be badly designed, increasing the risk of errors or inefficiency.

E.g. a user may put a second large table immediately below the first, rather than diagonally offset. If he or she then deletes a column of data from the first table, then data may be unintentionally lost from the second one as well.

b) Users are unlikely to document the workings of their spreadsheet, as they consider it 'obvious'. This makes it difficult for other staff to understand use or modify the model.
c) The lack of proper audit trail can be a disadvantage. Because the user works with a spreadsheet in memory (RAM), only saving it at certain intervals, it is unlikely that a record of the intermediate stages will be maintained, even if output from the intermediate stages is important.

9:2 WORD PROCESSING

WORD PROCESSORS

Word processing is the processing of text information. Typically word processing soft ware may be used for production of standard documents.

Features of a word processor
The following are some of the features of a typical word processor.

(i) Adding headers and footers
(ii) Inserting footnotes
(iii)Using different characters fonts in a variety of services.
(iv)Changing texts to bold italic, underlined, double underlined, etc.
(v) Spell checking - for spelling errors and in some programs checking for grammatical errors.

Some word processors especially modern one have additional features not available in older word processor e.g.
(i) Adding lines or boxes in a variety of width and style.
(ii) Inserting digitised photos and artwork.

(iii) Creating charts and tables with newly entered data or by linking to data that already exists in a data file.
(iv) Drug and drop editing.
(v) Creating a table of contents or index automatically.
(vi) Main merging - where automatic formats for different types of letter may exist.
(vii) Importing data from other -programs like spreadsheets.
(viii) Compatibility - where major packages are very similar and highly compatible e.g. a WordPerfect file may be opened, edited and saved in Ms Word.

9:3 DESK TOP PUBLISHING (DTP)

DTP is the use of office computers to implement computerised typesetting and composition systems. They can be used for producing master pages for a book, newspapers, leaflets, etc.

Graphics (Computer Graphics)

Another use of computers is the production of information in the form of pictures, diagrams or graphs. A widely used office package is corel draw.

9: 4MICROSOFT ACCESS

This is used to design data bases and create management reports.

9:5 COMMUNICATION

Under this topic, we shall see how telecommunication hardware is used in office work.

Telex

Telex is a service which enables users to transmit and receive printed message over a telephone line. Users have to be telex subscribers, with their own telex equipment and code number in order to send or receive messages.
Telex services started in the 1930's
Data transmission speeds are very slow with Telex as compared to other methods telecommunication and only restricted set of characters can be used in messages.

Fax (or Facsimile)

This involves the transmission of messages by a data link of exact duplicate copies of documents. The original is fed into the fax machine, which reads it and converts it into electronic form so it can be transmitted over the telephone.

It is printed by the recipient fax machine.
The latest fax machines can also be used to scan data into a PC, as printers for PC output and as photocopies.

Electronic Mail (E-mail)

The term 'electronic mail' or 'e-mail', is used to describe various systems of sending data or messages electronically via a telephone or data network and a central computer, without the need to post letters or place memos in pigeon-holes, etc.

E-mail has the following advantages

a) Speed E-mail is far faster than post or fax. It is a particular time saver when communicating with people over seas.

b) Economy (no need for stamps, envelopes, etc) it is far cheaper than fax or post.
c) Efficiency. Messages are prepared once but can be sent to thousands of employees at the touch of a button.
d) Security. Access can be restricted by the use of passwords.

Voice Mail
Voice mail systems enable the caller's message to be recorded at the recipient's voice mail box. It requires a telephone, and no keying or typing is necessary.
A voice mail message is basically a spoken memo.

THE INTERNET
The Internet is the name given to the technology that allows any computer with a telecommunications link to exchange information with any other suitably equipped computer.

Also Internet refers to the international network.

Web sites/page
As you are no doubt aware, most companies of any size now have a 'site' on the Net.
A site is a collection of screens providing information in multi media form (text, graphics and often sound and video), any of which can be viewed simply by clicking the appropriate button, word or image on the screen.

Internet Service Providers (ISPs)
Connection to the Internet is made via an Internet Service Provider (ISP). The user is registered as an Internet subscriber and pays a small monthly fee together with local telephone call charges. Examples of ISPs include American On-line (AOL), Spacenet in Uganda, Uganda Telecoms, etc.

Browsers and Search Engines
Browsers
These are programs that are used to run the internet. Example is Netscape Navigator.

Search Engine
These are used to guide the users surfing the net examples include, Yahoo! Aita Vista.

Uniform resource locator (Website address) (URL)

Each web page has a unique address called the uniform resource locator (URL)

All you need is type in the URL for the website you want to visit and enter.
An example of URL could be like http!//w.w.w.TBC.co.ug.

URL Element **Explanation**

http!/ /	Hyper text transfer protocol, the portico used on the world-wide web for the exchange of documents produced in what is known as 'hyper text mark-up language (HTML). The forward slashes after the colon introduce the 'host name' such as www.
www	This stands for World Wide Web. As noted before, to put it simply the web (via its use of HTML), is what makes the internet user-friendly.
TBC	This is the domain name of the organisation or individual whose site is located at this URL.
Co	This part of the VRL indicates the type of the organisation concerned. The Internet actually spans many different physical networks around the world including commercial (Com or Co), schools (ac or edu) and other research networks (org, net) military (mil) net works, and government networks.
Ug	As you can possibly guess, this indicates that the organisation is located in Uganda commercial use of the Internet.

Marketing

Organisations used the Internet to provide information about their own products and services. Customers simply log on to the appropriate website and get to know the latest products on the market and so many other things.

Sales

Interactive electronic purchasing is possible with the Internet, the customer simply provides details of her/his credit card on the internet along with the order. This facility is not yet very common here in Uganda but its very attractive in Europe and America.

Distribution

The Internet can be used to get certain products directly into people's homes. Any thing that can be converted into digital form can simply be up loaded on to the seller's site and then down loaded onto the customer's PC at home. The Internet thus offers huge opportunities to producers of text, graphics/video and sound-based products. Much computer soft ware is now distributed in this way.

Other uses of the Internet

Entertainment

A variety of quality games are available on the net.

Information

On the net you can have access to information of any subject imaginable e.g. newspapers, magazines, job listings, airline schedules, college prospectus, movies, etc.

Discussion group
You can join discussion groups on the net to meet people with similar interests. You can ask questions, discuss problems and read interesting stories.

E-mail
Exchanging email is the most popular feature on the Internet. You can exchange e-mail on computers around the world.

Problems with the Internet
Being owned by no one, there are no clear guidelines on how the internet should develop. Today you can find the good, bad and different items on the net e.g. Bible preaching and phonography.

Employees of an organisation may spend so much time on the net surfing useless sites - thus wasting the organisation's useful time.

Lack of security on the Internet is another problem. This is especially with the e-mails - information such as credit card details is not communicated comfortably.

Cost is another major problem. You need a relatively high quality PCs, which are expensive; in addition, connection fees, access time fee and web site designing fees are also high.

With much less powerful equipment e.g. a slow modern and a slow processor, gaining access to useful information becomes slow and quiet painful.

Getting connected to the Internet

You need specific equipment and program to connect to the Internet.

1. Computer - any type of computer, which is relatively strong.
2. Programs - you need special programs to use the Internet e.g. e-mail programs, etc.
3. Modems - you need a modem to connect to the Internet. A modem of at least 14,400 bps is recommended.
4. Telephone line.

Other forms of the Internet

Intranets
This is an internal Internet, available to individuals with in a specific organisation.

The intranet is used to provide a relatively quick and easy method of providing and information sharing system in an organisation.

Extranets
This is an extension of the intranet where some third party access is allowed to the internal web sites.

Uses and benefits of the intranets
Allowing access to databases, no matter where they are located with in the organisation.

This helps to support the obtaining and sharing of information between worker throughout an organisation as well as minimise the need to keep the data in more than one place.

An intranet will allow the creation of on-line catalogues, handbooks, and directories that can be accessed and up dated as necessary e.g. an internal telephone directory for an organisation of say 100,000 employees world wide will change on a daily basis as a new staff are hired and existing staff leave.

Intranet will save the organisation costs in terms of printing and distributing the paper based manuals and handbooks etc.

Some intranets can be linked to legacy system allowing older corporate data to be obtained and analysed along side more recent transaction data.

Information is provided in a more user-friendly format, which helps encourage the use of the internet.

Training costs are limited because users will already be familiar with browser technology from using the Internet.

Uses and Benefits of the Extranets
They provide on-line information for customers and suppliers provide 'added value' to the products and services provided by the organisation.

Allowing authorised buyers of the organisations' products access to information about those products to help them decide which product is appropriate for a specific use.

Linking with existing EDI (Electronic Data Interchange) applications to provide full stock control, procurement and payment systems.
Full Meanings of the words as applied in information technology/system

LIST OF ABBREVIATIONS

ABBREVIATION	ABBREVIATION IN FULL
4.GL	Fourth Generation Language

ALU	Arithmetic Logic Unit
AOL	America on Line
AS II	America National Standard Code for Inform date Interchange
ATM	Automated Teller Machine
BASIC	Beginners All Purpose Symbolic Codes
BIOS	Basic Input – Output System
BIT	Binary Digit
BTM	Business Teller Machine
CD	Compact Disk
CIS	Computer Information System
CLS	Clear Screen
COBOL	Common Business Oriented Language
CPU	Central Processing Unit
CU	Control Unit
DBMS	Database Management System
DDL	Data Definition Language
DEEP BLUE	Computers are modern computers that are an IBM computer programmed to play Chess with the world class champion, Garry Kasorok. Programmed to make 1 million moves in a second, which defected the world chess champion in the world.
DEL	Delete
Dir	Directory
Disk Drives	Media where computer programme files reside e.g., Hard disks, floppy Disks, CD-ROM, Magnetic tapes etc.
DML	Data Manipulation Language
DOS	Disk Operating System
DPC	Desktop Personal Computer
Drives	External storage medium storage capacity more than floppy and less then hard disk drive, designed with letters D...E.
DTP	Desk top Publishing
DVD	Digital Video Disk
E-mail	Electronic Mail
EMF	Electronic Magnetic Fields
EPOS	Electronic Point of Scale
EWN	Enterprise Wide Network – Any Private Network connects all of organization CPS no matter what they run or where they are located.
Expansion Slots	are access slots on the C.P.U where new computer cards can be fixed when upgrading (expanding) a computer. When adding another floppy drive, adding a CD ROM Drive a higher memory chip.
Floppy Disks Drives.	External storage medium, less storage capacity than Hard disks drive designed with letters

FORTAN	Formula Transaction
GB	Byte
GUI	Graphical User Interface - medium through user interacts with a CP
Hard Disk Drive	Internal Storage mechanism stores most computer applications. Capacity 100MB designed work letters
HLL	High Level Language
IBM	International Business Machine
ILL	Intermediate Level Language
INTERNET	International Network
IRR	Internal Rate of Return
ISP	Internet Service Provider – Provides Internet to users who register at 15 P using other dial to dedicated access.
IT	Information Technology
KB	Kilo Bytes
KIPS	Kilo Instructions Per Second - its Speed
KISS	Keep it small Simple
LAN	Local Area Network
LLL	Low Level Language
MAN	Metropolitan Area Net – Work
MB	Mega Byte
MICR	Magnetic Ink Character Recognition
MIPS	Millions Instructions per Second
MODEM	Modulation Demolecular
MS DOS	Micro Soft Disk Operating System
Ms Excel	Micro soft Excel
MULT	Multiply
NPV	Net Present Value
NT	Net Work
OCR	Optical character Recognition
OS	Operating System
OUR	Optical Work Reading
PC	Personal Computer
PIN	Personal Identification Number
Ports	Are connections (sockets) on the C.P.U which a computer components (Device) like a printer, mouse, modern etc. Can be connected.
RAM	Random Access Memory
ROM	Read only Memory
SAN	Storage Area Network
SDLC	System Development Life Cycle
SSDM	Special Standard System Development management maintenance
SSM	Special Standard System Management/maintenance
SQL	Structured Query Language
SUB	Subtract

TCP/IP	Transmission Control Protocol/internet Protocol system used to transfer information from one computer to another.
UPS	Uninterrupted Power Supply
URL	Uniform Resource Locater
VAN	Value Added Network
VDU	Visual Display Unit
W.W.W	World Wide Website
Web Server	Software that delivers web pages and contains of web sites.

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Africa Population Institute
P. O. Box 10842, Kampala Uganda
Website: www.africapopulaation.net Email: info@africapopulation.net
Tel:+256-772/712/702-836998

AFRICA POPULATION INSTITUTE
ROJECT APPRAISAL AND PRE-INVESTMENT ANALYSIS
PAPER CODES: **APDPM 301**

1. a) Define project appraisal in your own words
   b) Explain the process of project appraisal

2. a) Examine in details the different types of appraisal
   b) Distinguish between Time and discounting vis-à-vis risk and uncertainty
   c) How does the weighted scoring method operate?

3. a) What is meant by the term pre-investment analysis?
b) Discuss in details the various areas of pre-investment analysis

PROJECT MONITORING AND EVALUATION
PAPER CODES: **APDPM 302**

1. a) Clearly distinguish between monitoring and evaluation
   b) Explain some of the program elements that can be monitored.

2. a) Describe the different types of evaluation as used in projects
   b) Show the major tools that are normally used in monitoring and evaluation.

3. a) Explain why indicators are very important elements in monitoring and evaluation
   b) Show clearly the characteristics of a good indicator.

RESEARCH METHODS
PAPER CODES: **APD(FA 303, PH 303, HR 302, IR 304, PA 304, LPS 303, SW 304, BA 303, PM 303)**

1. a) Research and experimental development comprise creative work undertaken on a systematic basis in order to increase the stock on knowledge;
Explain the different types of variables used in research.
b) Using relevant examples, explain the difference between discrete and continuous variables

2. a) Descriptive research are designed to gain more information about a particular characteristic within a particular field of study
   b) Explain how it is different from exploratory research
   c) What is the difference between a research proposal and a project proposal?

3. a) With some form of detail, illustrate the structure of a research report
   b) Examine the different forms of experimental designs
   c) Assess the different levels of data analysis

ENTREPRENURESHIP SKILLS AND PRACTICE

PAPER CODES: **APD(FA 304, HR 303, LPS 305, BA 304, PM 304)**

1. a) Discuss at least 3 distinctions between entrepreneurship and Intrapreneurship.
   b) Give not less than 7 conditions that favour establishment of Intrapreneurship in organizations.

2. a) Discuss the fundamental questions one would ask before buying a franchise
   b) What are the pros and cons of franchising?
   c) What 5 advantages may a firm enjoy from using venture capital financing?

3. a) Supposing you are a loans officer of a lending institution, what factors would you consider before extending a loan to an entrepreneur?
   bDiscuss the arguments for and against
   i) Buying a business?
   ii) Starting a business?

INFORMATION TECHNOLOGY

PAPER CODES: **APD --- 105**

1. Information technology always deals with organizational need
Examine the stages involved in the systems development life cycle

2. File are used to store data and information that will be needed again in future or for the current use
   a) Explain the different data processing operation
   b) What are the features of storage and retrieval systems?

3a) with relevant examples, Analyse the different forms of security issues as used in information technology
   b) A spread sheet is a general purpose software package for modelling
      i) Explain the different applications of spread sheet
      ii) What are features of a word processor?