BA IN MANAGEMENT

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CHAPTER ONE

GENERAL INTRODUCTION

Meaning and definition of project

A project is a planned set of interrelated tasks to be executed over a fixed period and within certain cost and other limitations. J. M. Juran has also defined that *“a project is a problem scheduled for solution.”*

Problem refers to the gap between where you are and where you want to be, with an obstacle that prevents easy movement to close the gap. The Chartered Management Institute has also defined a project as …"an activity that has a beginning and an end which is carried out to achieve a particular purpose to a set quality within given time constraints and cost limits".

Generally, projects are a group of activities that have to be performed with limited resources to yield specific objectives, in a specific time, and in a specific locality. Thus, **a project is a temporary endeavour employed to create a unique product, service or results.** Projects are an investment on which resources are used to create assets that will produce benefits over an expanded period of time. It is a unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraints of *time, cost* and *resources*.

Project is a fairly recent phenomenon in history. Earlier, most tasks in society were handled by designated permanent organizations – be it the construction of a bridge or a road, arranging a cultural or a sports event, developing a new industrial product, solving a research problem or testing a new drug. Over the last decades, however, projects have become increasingly important as a way to organize work. More than ever before, projects are used to solve big tasks of public utility. They operate across organizations, and are terminated when the planned task is completed. There has been a significant increase in the amount of such major projects – not least in sectors such as offshore,

infrastructure and information technology. But projects are also organized within individual organizations. This means that their value added and profitability increasingly depend on successful projects.

Organizations perform work. Work generally involves either *operations* or *projects*, although the two may overlap. Operations and projects share many characteristics; for example, they are performed by people, and planned, executed, and controlled. They differ primarily in that operations are ongoing and repetitive while projects are temporary and unique. Temporary means that every project has a definite beginning and a definite end. Temporary does not signify any type of duration. So a project can be a few weeks to a few years. Unique means that the product or service is different in some distinguishing way from all similar products or services. Projects are undertaken at all levels of the organization. They may involve a single person or many thousands. They may require less than 100 hours to complete or several million hours. Projects may involve a single unit of one organization or may cross organizational boundaries as in joint ventures and partnering. Projects are often critical components of the performing organization's business strategy. Examples of projects include:

- ✓ Developing a new product or service.
- ✓ Effecting a change in structure, staffing, or style of an organization.
- ✓ Designing a new transportation vehicle.
- ✓ Developing or acquiring a new or modified information system.
- ✓ Constructing a building or facility.

- ✓ Running a campaign for political office.
- ✓ Implementing a new business procedure or process.

The tasks that projects are assigned to solve are defined in terms of more or less precise and realistic *goals*. Being a temporary arrangement, and also because the undertaking is more or less unique, uncertainty is often greater than what is common in permanent organizations. Because of the uncertainty associated with planning and implementation, the extent to which the project will attain its goal is also uncertain. This is one of the reasons why improved know-how and tools that can better the planning and management of projects are of great and increasing economic significance. It is also one of the reasons why there has been an increasing tendency to evaluate ongoing and completed projects. There are numerous examples of projects that have caused high additional cost for the society both during and after they have been implemented. A comprehensive study of major projects, *Morris and Hough (1991)2*, concludes that the track records of projects are fundamentally poor, particularly for the larger and more difficult ones. Overruns are common. Many projects appear as failures, particularly in the public view. It seems therefore that there is a contradiction between the increasing use of projects and the fundamental problem of projects often overrunning their budgets and exceeding their set limits.

However, in reality, most projects attain their objectives in one way or another, even if too many are made too expensive or are delayed. There are several reasons for the increasing use of projects today. One answer is that many tasks in society are so enormous and complex that individual organizations lack the competence or capacity to carry

them out alone. This is particularly the case in small countries. Another answer is that the project focuses and visualizes the task, and therefore has a motivating effect on all stakeholders. In projects, responsibilities are clarified and the different parties are made accountable. Moreover, the project is an expedient way of transferring risk from the financing to the implementing party. The project is also a conducive way of organization, which allows participants to pool resources and co-operate towards a common goal. Projects could be short range and long range.

Short Range Projects:

They are completed within one year, and are focused towards achieving the tactical objectives. They are less rigorous; require less or no risk. They are not cross functional. These projects require limited Project Management tools, and have low level of sophistication. It is easy to obtain approval, funding and organizational support for short range projects. For example, reduce defect in shop number two from 6 to 4 percent.

Long Range Projects:

These projects involve higher risk and a proper feasibility analysis is essential before starting such projects. They are most often cross functional. Their major impact is over long period of time, on internal as well as external organization. Large numbers of resources are required to undertake long range projects and they require breakthrough initiatives from the members.

1.2 Why Projects are initiated?

Projects don’t just happen to give people something to do – usually. Projects are launched for a purpose. Now the purpose may be masked from the project manager and the project team, projects usually, if not always, center on two things: cutting costs or increasing revenue. Think of any project that you ever know; did the project cut costs or increase revenue?

If you drill a little deeper, and if you think back the different projects that you know, you’ll find that projects are typically initiated for one or more of the following reasons:

- Market demand
- Advances in technology
- Solving a business need
- At the request of a customer
- New laws and regulations
- Social needs in your community
- Desire to be more competitive
- Responses to competition

Policies, Programmes, and Projects

Policies determine the environment and frameworks within which change interventions (or development) take place. National goals and strategies, which are implemented through various policy instruments and interventions, have an effect on society through a series of sequential feedback linkages. Policies are frequently implemented through programmes. A policy is typically

described as a principle or rule to guide decisions and achieve rational outcome(s). The term is not normally used to denote what is actually done; this is normally referred to as either procedure or protocol. Whereas a policy will contain the 'what' and the 'why', procedures or protocols contain the 'what', the 'how', the 'where', and the 'when'. Policies are generally adopted by the Board of or senior governance body within an organization where as procedures or protocols would be developed and adopted by senior executive officers. A Policy can be considered as a "Statement of Intent" or a "Commitment". For that reason at least, we can be held accountable for our "Policy"

Programmes consist of different activities of a government implemented in a formally coordinated way through ongoing activities and projects. The execution of a National Development Plan is therefore commonly viewed as providing the frameworks for the effective performance of a country’s economy.

1.3 Features of a project

There are some unique features that distinguish a project from other types of corporate activity. One of the most striking features is that in creating a project there automatically follows its "death sentence". That is because projects have a *defined start and end time.* Moreover, the end is forecast/projected/established/mandated/knowable once the project starts. Simply put: you are in business to get out of that

business as fast, as soon and as profitably as possible. And when you've finished you don't have anything else to do!

A project always *has associated with it certain resources*. Such resources may be any combination of time, funds, talent, knowledge, services, personnel, space, facilities, equipment, materials, and so on. These resources can be of multiple kinds: used-and-returned; used-and-delivered-with-the-product; used-and-consumed; generated-by-project-activity; limited life or time-dependent; etc. The kind will typically vary with the project's life span stage of the project. The variety of resources employed in project activities, and often the duration and criticality, is typically an order of magnitude above those found in most other corporate activities.

It is often true that a much wider range of internal (corporate) resources will also be involved in project activities. These can range from the five-minute signing of the funding arrangements by the Treasurer (critical to project progress) to the arrangements for a procedures audit to satisfy a client request in connection with a payment release. To add to the difference, the range and degree of external or procured resources applied on a project is often orders of magnitude greater than that experienced by normal corporate procurement activities.

The nature of the relationships that exist over the life of a project's effort is another unique feature. Typically, all the *relationships are temporary*, as is the project itself. Also all the participants, stakeholders, onlookers, supporters, detractors, suppliers, customers, and competitors know that these relationships are temporary and will cease totally when the project is finished.

It is this fluid and ever-changing area of relationships that has lead to the characterization of project management as "The art and science of managing interfaces”.

Characteristics of projects

- ✓ **Projects have a purpose:** Projects have clearly-defined aims and set out to produce clearly-defined results. Their purpose is to solve a "problem”, and this involves analysing needs beforehand. Suggesting one or more solutions, a project aims at lasting social change.
- ✓ **Projects are realistic:** Their aims must be achievable, and this means taking account both of requirements and of the financial and human resources available.
- ✓ **Projects are limited in time and space**: They have a beginning and an end and are implemented in (a) specific place(s) and context.
- ✓ **Projects are complex:** Projects call on various planning and implementation skills and involve various partners and players.
- ✓ **Projects are collective:** Projects are the product of collective endeavours. They involve teamwork and various partners and cater for the needs of others.
- ✓ **Projects are unique:** Projects stem from new ideas. They provide a specific response to a need (problem) in a specific context. They are innovative.
- ✓ **Projects are an adventure:** Every project is different and ground-breaking; they always involve some uncertainty and risk.
- ✓ **Projects can be assessed:** Projects are planned and broken down into measurable aims, which must be open to evaluation.
- ✓ **Projects are made up of stages:** Projects have distinct, identifiable stage

1.4 What Projects are Not

Since a project is by definition a unique set of activities not repeated in operational cycle(s), it follows that we can also define a project by exclusion. For example, a monthly closing is not usually considered a

project. But an effort to study the closing process and its related activities, timings, resource utilization, etc. in order to improve some aspect or feature of the closing can indeed be a project.

The statement about non-cyclic nature needs interpretation. For example in process plant construction each project will in fact have piping spools that are cut/fit/welded and then installed/tested. However, the design, procurement, installation, test, startup and turnover process for that plant will not be repeated. When a similar plant is to be built in almost the same configuration but at a different location, the differences introduced by time, changes in markets, techniques, infrastructure, etc. not to mention the possibility of a different client, all make each project unique.

Another aspect of project work is that projects are rarely successful when run by a committee. Not that there is nothing theoretically wrong with assigning a project to a committee, it is just that committee management is not suited to the needs of successful projects. A wag once observed that a camel was the product of a committee running a project to produce a horse

1.5 The three key characteristics of a project

While no two projects are identical, there are three key characteristics that all projects possess. These three characteristics must always be considered when making a decision within a project and also provide constraints to the delivery of the objective.

The three key project characteristics are:

- **Time**
- **Scope**

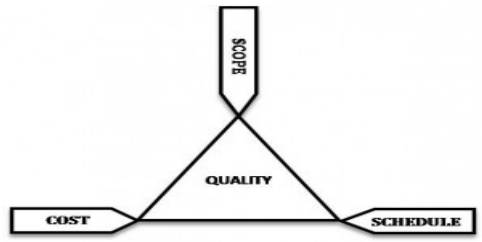
- **Budget**

Time (sometimes known as timeframe or schedule): This refers to how long the project will take, and generally involves using past experience to predicate the likely time that parts of a project will take. The scheduling involved in a project shows what should happen when and there are usually parts that can't occur until preceding parts are complete. Using the previous kitchen renovation example, you can't compare quotes until you have them and you can't be given quotes until the kitchen company knows what they are quoting for.

Scope: Scope refers to what is included within the project and what is excluded. This is where you will establish if re-plumbing the kitchen is in scope, if installing new white ware such as a fridge or dishwasher is in scope, or if replacing the kitchen floor is in scope. The clearer the scope, the easier for ambiguity to be reduced and risks minimized.

Cost (also known as budget): The budget or cost of the project sets out your expectation as to how much the project will cost. Most of the time in project cost determination the vendor will provide a quote based on the number of hours it will take to develop a given feature. For example a project to have a well designed kitchen in your house, it might be a couple of figures composed of the physical cost of the kitchen alongside the labor cost of the install.

Together these three aspects create what is known as the **Project Management Triangle**, and any change to one of the characteristics will result in a change to at least one of the others.



Source: Wikipedia, John Manual Kennedy

Q = *f* (T, C, S)

An example of such a change could be that you need the kitchen installed by a certain date e.g. two weeks earlier. The kitchen company agrees that can be done but says it will cost you an extra 50% in labour costs and you will need to decide if that is acceptable for you.

Likewise, the quoted price for a new kitchen may be too high. The company may be able to bring the price down by lowering the scope and ditching some of the jewel encrusted taps and gold leaf bench tops.

Finally, if you want to change the project scope, for instance add French doors to your kitchen, it's going to either bump up the price or add time to the finish date, or most likely both.

Another important characteristic of a project is that a project is temporary. While some projects may run for years and years, they do have a set goal in mind which, when completed, will mean the project is over. Often these projects will end and then a new project will start which picks up from where the previous project ended. With new CRM/database systems, once they have been delivered, there are usually many smaller subsequent updates which form part of a new project or projects.

One sign of a poorly managed project could be that the project structure continues to operate for quite some time after the project has been delivered. Of course, learning that a project is poorly managed is something we would rather know sooner than later!

1.6 Projects and plans

Reading assignment!

How do you differentiate projects and plans?

1.7 The 3 Major Project Types

1. Civil Engineering, Construction, Petrochemical, Mining, and Quarrying

Projects in this category are those which spring to mind most readily whenever industrial projects are mentioned. Once common feature is that the fulfillment phase must be conducted on a site that is exposed to the elements, and usually remote from the contractor's main office.

These projects incur special risks and problems of organisation. They often require massive capital investment, and they deserve (but do not always get) rigorous management of progress, finance, and quality.

For very large industrial projects the funding and resources needed are often too great for one contractor to risk or even find. The organisation and communications are therefore likely to be complicated by the

participation of many different specialists and contractors, with the main players possibly acting together as a consortium or joint venture company.

2. Manufacturing Projects

Manufacturing projects aim to produce a piece of equipment or machinery, ship, aircraft, land vehicle or some other item of specially designed hardware. The finished product might be purpose-built for a single customer, or the project could be generated and funded from within a company for the design and development of a new product intended for subsequent manufacture and sale in quantity.

Manufacturing projects are usually conducted in a factory or other home-based environment, where the company should be able to exercise on-the-spot management and provide an optimum environment.

Of course, these ideal conditions do not always apply. Some manufacturing projects can involve work away from the home base, for example in installation, commissioning and start-up, initial customer training and subsequent service and maintenance. More difficult is the case of a complex product (such as an aircraft) that is developed and manufactured by a consortium of companies, very possibly overlapping international borders, with all the consequent problems of risk, contractual difficulties, communication, coordination, and control.

3. Management Projects

This class of projects proves the point that every company, whatever its size, can expect to need project management expertise at least

once in its lifetime. These are the projects that arise when companies relocate their headquarters, develop and introduce a new computer system, launch a marketing campaign, prepare for a trade exhibition, produce feasibility or other study report, restructure the organisation, mount a stage show, or generally engage in any operation that involves the management and co-ordination of activities to produce an end result that is not identifiable principally as an item of hardware or construction.

Although management projects might not result in a visible, tangible creation, much often depends on their successful outcome. There are well-known cases, for instance, where failure to implement a new computer system correctly has caused serious operational breakdown and has exposed the managers responsible to public discredit. Effective project management is at least as important for these projects as it is for the largest construction or manufacturing project.

Projects can also be classified as:

- ***Type I Projects – Large Engineering Projects:***

They have well defined project methods and end project requirements, such as construction projects.

- ***Type II Projects – Product Development Projects, Early Space Projects:***

They have poorly defined project methods but have well defined project end requirements.

- ***Type III Projects – Software Development Projects:***

In these, the shape of end product proceeds. They have well defined project methods, but poorly defined project end requirements.

- ***Type IV Projects – Organizational Development Projects, Vision Definition, Assessment of Impact of Trainings:***

They have both poorly defined project methods as well as project end requirements.

There many other ways of classifying projects like ***Type A, Type B and Type C***

CHAPTER TWO

Project cycle

1.1 Meaning and definition

Seven stage process through which practically every major project goes through: (1) Identification: stage where one project-idea out of several alternatives is chosen and defined. (2) Preparation: defined idea is carefully developed to the appraisal stage. (3) Appraisal: every aspect of the project idea is subjected to systematic and comprehensive evaluation, and a project plan is prepared. (4)

Presentation: detailed plan is submitted for approval and financing to the appropriate entities. (5) Implementation: with necessary approvals and financing in place, the project plan is implemented. (6) Monitoring: at every stage the progress of the project is assessed against the plan. (7) Evaluation: upon completion the project is reassessed in terms of its efficiency and performance. The seven stage process is also called project life cycle.

1.2 Phases of the Project Cycle

Successful projects move through seven phases of the project cycle, though not always in order. We have to deal more about these phases along with potential pitfalls that keep projects from succeeding. Although instinct might encourage business professionals to dive right into projects, successful leaders understand that effective project cycles contain seven distinct phases. Few projects actually move through all seven phases in order. Some projects may require retooling that causes more time for preparation and presentation. Longer projects may necessitate alternating phases for implementation, monitoring, and evaluation. In all cases, however, project managers should prepare for the distinct needs of each project phase.

1. Identification

Most projects enter the first phase of the project cycle with little or no structure. Ideas that start in the back of the mind start to bubble up into potential projects. As creative professionals include colleagues,

supervisors, or investors, projects become more formalized and start to follow the traditional phases of a project cycle.

On the other hand, regular project cycles, such as grant competitions and workplace initiatives, often operate from a top-down level. Project leaders usually issue a request for proposals or a call for submissions, in order to discover the most effective solution to a particular problem. In this kind of project, judges must filter through different ideas before settling on the team that will take a project through the project cycle's six remaining stages.

2. Preparation

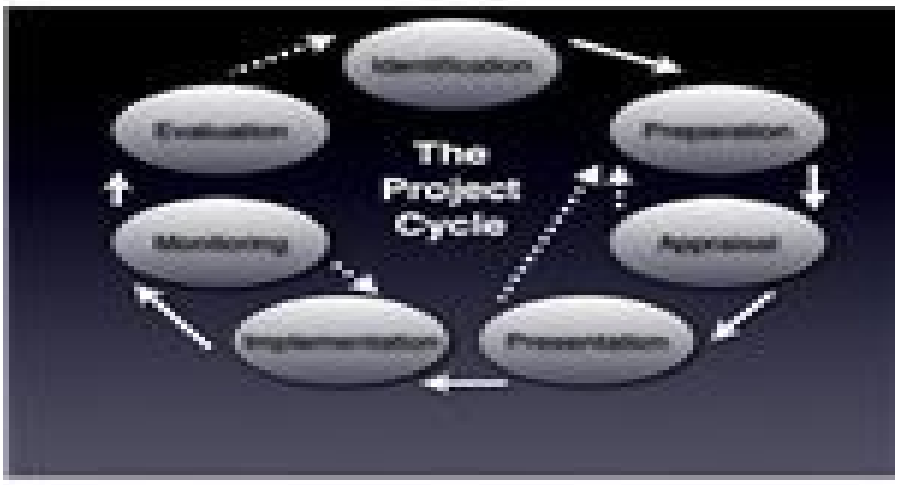
This phase of the project cycle requires leaders and managers to research both the needs and the impact of a project. The preparation phase often includes brainstorming sessions that result in "pie in the sky" estimates instead of true cost/benefit analysis. Effective preparation also includes laying the groundwork for the evaluation phase of the project cycle. Without agreeing on specific goals or outcomes, participants have no reliable way to measure the success of their project.

3. Appraisal

During the appraisal phase of a project cycle, project managers negotiate with stakeholders for resources while setting timelines. Depending on the scope of a project, leaders must determine whether hiring or outsourcing human resources will play a role during the implementation phase. Other resources, like technology and real estate, require budget estimates and impact statements during this

phase. The appraisal phase of the project cycle ends once a clear plan with a timeline, budget, and expected outcome is ready for submission to decision makers

- **4. Presentation**



Arguably the most crucial phase in any project cycle, the presentation often determines whether or not a project will reach its eventual conclusion. Depending on the nature of the project, decision makers could include board members, supervisors, investors, creditors, community members, customers, or other stakeholders. By the presentation phase, project managers and planners should be able to communicate:

- project need
- goals and expected outcomes
- budget
- timeline

Although many project managers prepare for the presentation phase of the project cycle by building Gantt charts and PowerPoint decks, most veteran planners recommend that presenters prepare to debate and to defend the merits of their proposals. It’s not uncommon for projects to move between the first three phases numerous times before receiving approval.

5. Implementation

While implementation represents just one phase of a seven-step project cycle, it frequently takes the longest amount of time. During this phase a project manager actually takes the steps to lead a team through the process developed during the previous four stages.

6. Monitoring

While some project management professionals prefer to view monitoring as a task that happens throughout the project cycle, many business schools now teach students to treat this important task as its own dedicated stage. Building a monitoring stage into a project cycle can involve measuring independent benchmarks or scheduling formal progress meetings. Unlike the evaluation stage of the project cycle, monitoring focuses more on individual tasks or personnel in order to make adjustments. Projects often shift between implementation and monitoring phases multiple times during a project cycle.

7. Evaluation

Highly functional organizations use the evaluation phase of the project cycle to answer three important questions:

- What went well during the project?
- What didn’t go so well?
- What would project leaders and team members do differently during future projects?

A successful evaluation phase requires effective planning during the preparation phase. If project members succumb to office politics or fail to document the shifting scope of a project, the evaluation phase of a project cycle can easily shift to “blaming and shaming.” However, when measurable goals are set and stakeholders agree on desired outcomes, all parties can make honest, insightful evaluations

Some authors do also view project cycle as a process with four phases; Initiation, planning, implementation and closing. To carry out the work of the project for the purpose of meeting the project's objectives; every project has beginnings, a middle period during which activities move the project toward completion, and an ending (either successful or unsuccessful). A standard project typically has the following four major phases (each with its own agenda of tasks and issues): initiation, planning, implementation, and closure. Taken together, these phases represent the path a project takes from the beginning to its end and are generally referred to as the project life cycle.

1. Initiation Phase

During the first of these phases, the initiation phase, the project objective or need is identified; this can be a business problem or opportunity. An appropriate response to the need is documented in a business case with recommended solution options. A feasibility study is conducted to investigate whether each option addresses the project objective and a final recommended solution is determined. Issues of

feasibility ("can we do the project?") and justification ("should we do the project?") are addressed.

Once the recommended solution is approved, a project is initiated to deliver the approved solution and a project manager is appointed. The major deliverables and the participating work groups are identified and the project team begins to take shape. Approval is then sought by the project manager to move on the detailed planning phase.

2. Planning Phase

The next phase, the planning phase, is where the project solution is further developed in as much detail as possible and you plan the steps necessary to meet the project's objective. In this step, the team identifies all of the work to be done. The project's tasks and resource requirements are identified, along with the strategy for producing them. This is also referred to as scope management. A project plan is created outlining the activities, tasks, dependencies and timeframes. The project manager coordinates the preparation of a project budget; by providing cost estimates for the labor, equipment and materials costs. The budget is used to monitor and control cost expenditures during project implementation.

Once the project team has identified the work, prepared the schedule and estimated the costs, the three fundamental components of the planning process are complete. This is an excellent time to identify and try to deal with anything that might pose a threat to the successful completion of the project. This is called risk management. In risk management, "high-threat" potential problems are identified along with the action that is to be taken on each high threat potential

problem, either to reduce the probability that the problem will occur or to reduce the impact on the project if it does occur. This is also a good time to identify all project stakeholders, and to establish a communication plan describing the information needed and the delivery method to be used to keep the stakeholders informed.

Finally, you will want to document a quality plan; providing quality targets, assurance, and control measures along with an acceptance plan; listing the criteria to be met to gain customer acceptance. At this point, the project would have been planned in detail and is ready to be executed.

3. Implementation Phase

During the third phase, the implementation phase, the project plan is put into motion and performs the work of the project. It is important to maintain control and communicate as needed during implementation. Progress is continuously monitored and appropriate adjustments are made and recorded as variances from the original plan. In any project a project manager will spend most of their time in this step. During project implementation, people are carrying out the tasks and progress information is being reported through regular team meetings. The project manager uses this information to maintain control over the direction of the project by measuring the performance of the project activities comparing the results with the project plan and takes corrective action as needed. The first course of action should always be to bring the project back on course, i.e., to return it to the original plan.

If that cannot happen, the team should record variations from the original plan and record and publish modifications to the plan. Throughout this step, project sponsors and other key stakeholders should be kept informed of project status according to the agreed upon frequency and format. The plan should be updated and published on a regular basis.

Status reports should always emphasize the anticipated end point in terms of cost, schedule and quality of deliverables. Each project deliverable produced should be reviewed for quality and measured against the acceptance criteria. Once all of the deliverables have been produced and the customer has accepted the final solution, the project is ready for closure.

4. Closing phase

During the final closure, or completion phase, the emphasis is on releasing the final deliverables to the customer, handing over project documentation to the business, terminating supplier contracts, releasing project resources and communicating the closure of the project to all stakeholders. The last remaining step is to conduct lessons learned studies; to examine what went well and what didn't. Through this type of analysis the wisdom of experience is transferred back to the project organization, which will help future project teams.

1.3 World Bank Project Cycle

The World Bank lends money to low and middle-income countries to support development and change. Development projects are implemented by borrowing countries following certain rules and procedures to guarantee that the money reaches its intended target.

According to World Bank Identification, Preparation, Appraisal-Approval, Implementation, Completion, Evaluation are the stages in the project cycle. The details of these stages are:

1. Country Strategy and Project Identification

The World Bank works with a borrowing country's government and other stakeholders to determine how financial and other assistance can be designed to have the largest impact. After analytical work is conducted, the borrower and the Bank produce strategies and priorities for reducing poverty and improving living standards.

Identified projects can range across the economic and social spectrum from infrastructure, to education, to health, to government financial management. The World Bank and the government agree on an initial project concept and its beneficiaries, and the Bank's project team outlines the basic elements in a Project Concept Note. This document identifies proposed objectives, imminent risks, alternative scenarios, and a likely timetable for the project approval process. Two other Bank documents are generated during this phase. The Project Information Document contains useful public resources for tailoring bidding documents to the proposed project, and the publicly available Integrated Safeguards Data Sheet identifies key issues related to the Bank's safeguard policies for environmental and social issues.

2. Project Preparation

The borrower government and its implementing agency or agencies are responsible for the project preparation phase, which can take several years to conduct feasibility studies and prepare engineering and technical designs, to name only a few of the work products required. The government contracts with consultants and other public

sector companies for goods, works and services, if necessary, not only during this phase but also later in the project's implementation phase. Beneficiaries and stakeholders are also consulted now to obtain their feedback and enlist their support for the project. Due to the amount of time, effort and resources involved, the full commitment of the government to the project is vital.

The World Bank generally takes an advisory role and offers analysis and advice when requested, during this phase. However, the Bank does assess the relevant capacity of the implementing agencies at this point, in order to reach agreement with the borrower about arrangements for overall project management, such as the systems required for financial management, procurement, reporting, and monitoring and evaluation.

Earlier screening by Bank staff may have determined that a proposed project could have environmental or social impacts that are included under the World Bank's Safeguard Policies. If necessary, the borrower now prepares an Environmental Assessment Report that analyzes the planned project's likely environmental impact and describes steps to mitigate possible harm. In the event of major environmental issues in a country, the borrower's Environmental Action Plan describes the problems, identifies the main causes, and formulates policies and concrete actions to deal with them. From a social point of view, various studies aimed at analyzing a project's potentially adverse effects on the health, productive resources, economies, and cultures of indigenous peoples may be undertaken. An Indigenous Peoples Plan identifies the borrower's planned interventions in indigenous areas that may be needed, with the objective of avoiding or lessening potential

negative impacts on the people. These plans are integrated into the design of the project.

3. Project Appraisal

Appraisal gives stakeholders an opportunity to review the project design in detail and resolve any outstanding questions. The government and the World Bank review the work done during the identification and preparation phases and confirm the expected project outcomes, intended beneficiaries and evaluation tools for monitoring progress. Agreement is reached on the viability of all aspects of the project at this time. The Bank team confirms that all aspects of the project are consistent with all World Bank operations requirements and that the government has institutional arrangements in place to implement the project efficiently. All parties agree on a project timetable and on public disclosure of key documents and identify any unfinished business required for final Bank approval. The final steps are assessment of the project's readiness for implementation and agreement on conditions for effectiveness (agreed upon actions prior to implementation). The Project Information Document is updated and released when the project is approved for funding.

4. Project Approval

Once all project details are negotiated and accepted by the government and the World Bank, the project team prepares the Project Appraisal Document (for investment lending) or the Program Document (for development policy lending), along with other financial and legal documents, for submission to the Bank's Board of Executive Directors for consideration and approval. When funding approval is

obtained, conditions for effectiveness are met, and the legal documents are accepted and signed, the implementation phase begins.

5. Project Implementation

The borrower government implements the development project with funds from the World Bank. With technical assistance and support from the Bank's team, the implementing government agency prepares the specifications for the project and carries out all procurement of goods, works and services needed, as well as any environmental and social impact mitigation set out in agreed upon plans. Financial management and procurement specialists on the Bank's project team ensure that adequate fiduciary controls on the use of project funds are in place. All components at this phase are ready, but project delays and unexpected events can sometimes prompt the restructuring of project objectives.

Once underway, the implementing government agency reports regularly on project activities. The government and the Bank also join forces and prepare a mid-term review of project progress. In addition, the World Bank's Report on the Status of Projects in Execution, a brief summary of all Bank-funded projects active at the end of each fiscal year, is available to the public. As projects close during the fiscal year, they are removed from this report, since their individual Implementation Completion and Results Reports are publicly disclosed at that time.

The project's progress, outcomes and impact on beneficiaries are monitored by the government and the Bank throughout the

implementation phase to obtain data to evaluate and measure the ultimate effectiveness of the operation and the project in terms of results.

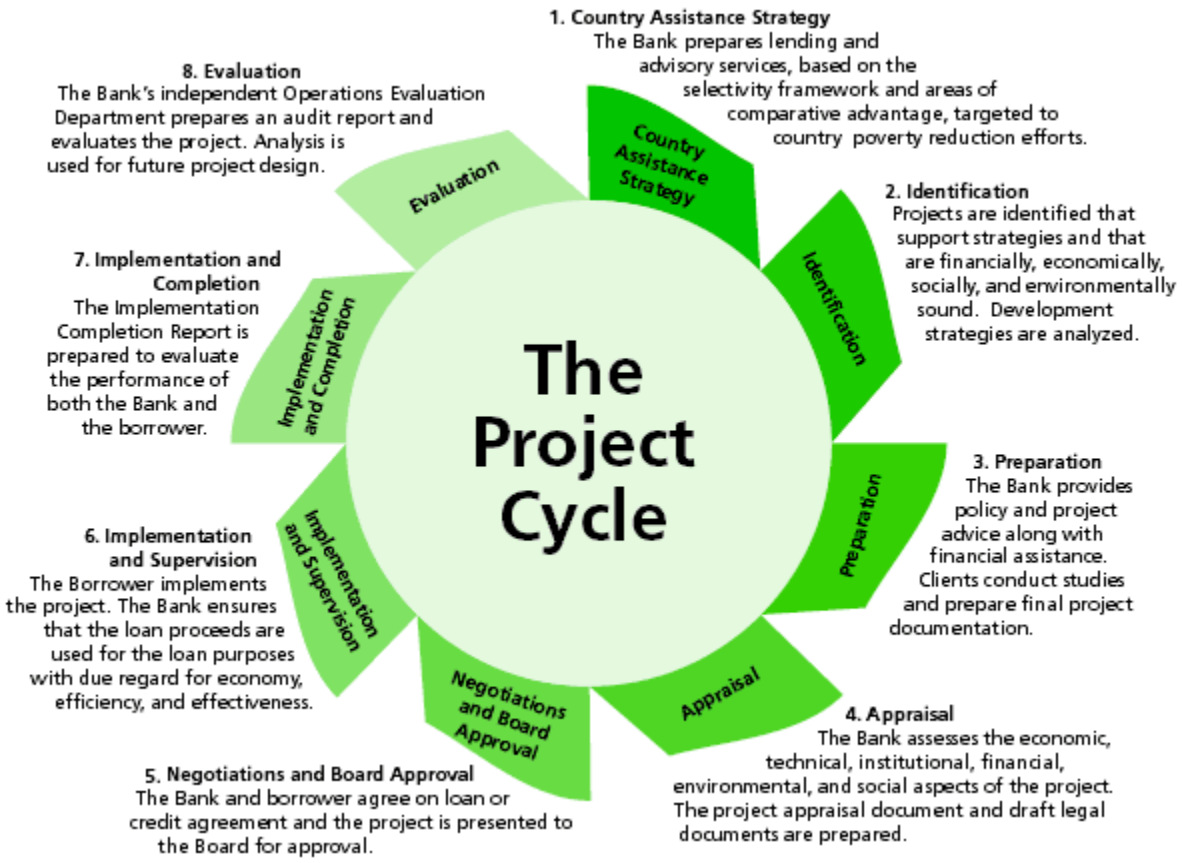
6. Project Completion

When a project is completed and closed at the end of the loan disbursement period, a process that can take anywhere from 1-10 years, the World Bank and the borrower government document the results achieved; the problems encountered; the lessons learned; and the knowledge gained from carrying out the project. A World Bank operations team compiles this information and data in an Implementation Completion and Results Report, using input from the implementing government agency, co-financiers, and other partners/stakeholders. The report describes and evaluates final project outcomes. The final outcomes are then compared to expected results. The information gained during this exercise is also often used to determine what additional government measures and capacity improvements are needed to sustain the benefits derived from the project. In addition, the evaluation team assesses how well the entire operation complied with the Bank's operations policies and accounts for the use of Bank resources. The knowledge gained from this results measurement process is intended to benefit similar projects in the future.

7. Evaluation

The Bank's Independent Evaluation Group assesses the performance of roughly one project out of four (about 70 projects a year), measuring

outcomes against the original objectives, sustainability of results and institutional development impact. From time to time, IEG also produces Impact Evaluation Reports to assess the economic worth of projects and the long-term effects on people and the environment against an explicit counter-factual. The world bank project can also be represented in the form of a figure as follows



1.4 United Nations Industrial Development Organization (UNIDO) project cycle

The United Nations Industrial Development Organization (UNIDO) is the United Nations' specialized agency with the mandate to promote industrial development in the world's developing and least developed

nations. The Organization supports governments, businesses and other stakeholders in their efforts to meet the challenges of, and to remove the barriers to, their industrial development. To do so, UNIDO mobilizes knowledge and information, builds capacity, and facilitates the transfer of technology to enhance competitiveness and advance the adoption of climate change mitigation measures. UNIDO's strategy is built upon three pillars:

- Poverty reduction: fostering the engagement of men and women in productive industrial activities
- Trade capacity-building: enabling industries in developing countries to produce and trade goods and services that meet national and international industrial standards
- Energy and environment: encouraging the adoption by industries of cleaner, resource efficient and low-carbon patterns of production and investment.

According to UNIDO, a project is a proposal for an investment to create, expand and/or develop certain facilities in order to increase the production of goods and/or services in a community during a certain period of time . Furthermore, for evaluation purposes, a project is a unit of investment which can be distinguished technically, commercially and economically from other investments.

Project preparation and evaluation

Project development is an integrated process carried out in several consecutive phases which may be condensed into three stages project preparation, its evaluation and implementation. It is

extremely important to point out that all three are closely interrelated and that the ultimate success of an investment decision depends equally on each of them. Project preparation itself consists of a series of interdependent measures with the aim of translating an idea into an operating project. This is done in different stages

- Identification
- Preliminary selection
- Formulation

Industrial project development starts with the identification of the project idea, a notion of possibility/desire to produce specific product(s) or to utilize specific resources. Project ideas may arise from studies of the product-consumption pattern of the country, market studies, surveys of existing industrial establishments, import schedules, internal resources, geological surveys, industrial linkages, sectoral and industry analyses, development plans, export possibilities, experience of other countries, increasing demand for manufactured inputs for different sectors, studies of technology and development literature etc. All ideas for projects are valuable and may prove to be the beginning of development.

The identification of a project idea is followed by a preliminary selection stage. The objective at this stage is to decide whether a project idea should be studied in detail and what the scope should be of further studies. The findings at this stage are embodied in a pre-feasibility study (opportunity study). The pre-feasibility study is carried out by an investor himself or by an investment promoter, e.g. a ministry or development agency. It is prepared on

the basis of data that are available in published form or that can be easily collected or worked out.

Once it is proved that a project idea deserves detailed study, an investor should be found who would be interested in following it up (should the promoter not be identical with the investor). If the pre-feasibility study indicates that the proposed project appears to be a promising one, the decision may be taken to proceed further with the formulation of the project.

The function of the formulation stage is to study from the technical, economic, financial and managerial aspects all the alternative ways of accomplishing the project. The concept of project evaluation adopted by the Manual objectives of the project idea, and to present the findings and supporting data in a systematic and logical order. This is done through partial (technical, management etc) or complete techno-economic feasibility studies. The complete feasibility study is the final document in the formulation of a project proposal. On the basis of this study a decision to implement and finance the project will be taken. The feasibility study should contain all technical and economic data that are essential for the overall economic and social evaluation of a project. The feasibility study should be so self-contained that on the one hand the evaluator cannot complain of the lack of data or imperfect analysis and, on the other, the decision maker cannot find anything hidden or missing. Accumulation and presentation of all technical and economic facts in a true and complete picture should be the main objective of this study.

The complete feasibility study is carried out by a consulting engineering firm, by a foreign supplier of equipment or by a potential investor who has the technical competence to accomplish this job. The complete feasibility study should contain as much of the information needed for project evaluation as possible. The UNIDO Manual suggests a set of model formats for the information most necessary for project evaluation. Indeed, a project's feasibility in terms of its commercial and national profitability should be established by means of the criteria and parameters which are usually applied by institutions involved in the investment decision. Project evaluation manuals, if widely distributed and adhered to, may serve this useful purpose. Ideally, commercial and national project evaluation can be limited to checking assumptions, quantities, prices and the parameters of such feasibility studies with very little original work left to be done. This would add efficiency and expedition to the usually protracted process of project preparation and evaluation Needless to say, the investors would appreciate such an approach.

The overall economic evaluation is a crucial exercise which is based on the project's feasibility report and precedes its implementation. More specifically, the overall evaluation is a systematic procedure for weaving the technical and financial information about the project, with relevant data about its economic environment, together into one or a few criteria on the basis of which the project is recommended for selection, modification or rejection. This procedure, however, does not mean

that the evaluation of a project starts only when its preparation ends. Actually, project preparation and partial economic evaluation should be carried out simultaneously and are closely related. An overall economic evaluation is carried out only on the basis of data provided at the end of the formulation stage.

Interest in the technique of project evaluation has expanded significantly in recent years. Countries at various stages of development with different types of economic systems are seeking the articulation of, and refinements in, the criteria by which corporations and/or governmental agencies would rationally filter projects competing for relatively limited resources. What renders project evaluation an indispensable, though sometimes a rather elaborate, task is the existence of alternative economic opportunities for the commitment of resources, since the selection of a project would be considered rational only if that project is superior in some respect to others. Its superiority could be based on commercial profitability, i.e the net financial benefits accruing to manual for Evaluation of Industrial Projects the owners of the project, or on national profitability, i.e the net overall impact of the project on the nation as a whole Whether the interest is in commercial or national profitability, the core of the evaluation process is somewhat similar and consists of three steps

(a) Firstly, the identification of the quantity, quality and timing of physical inputs and outputs,

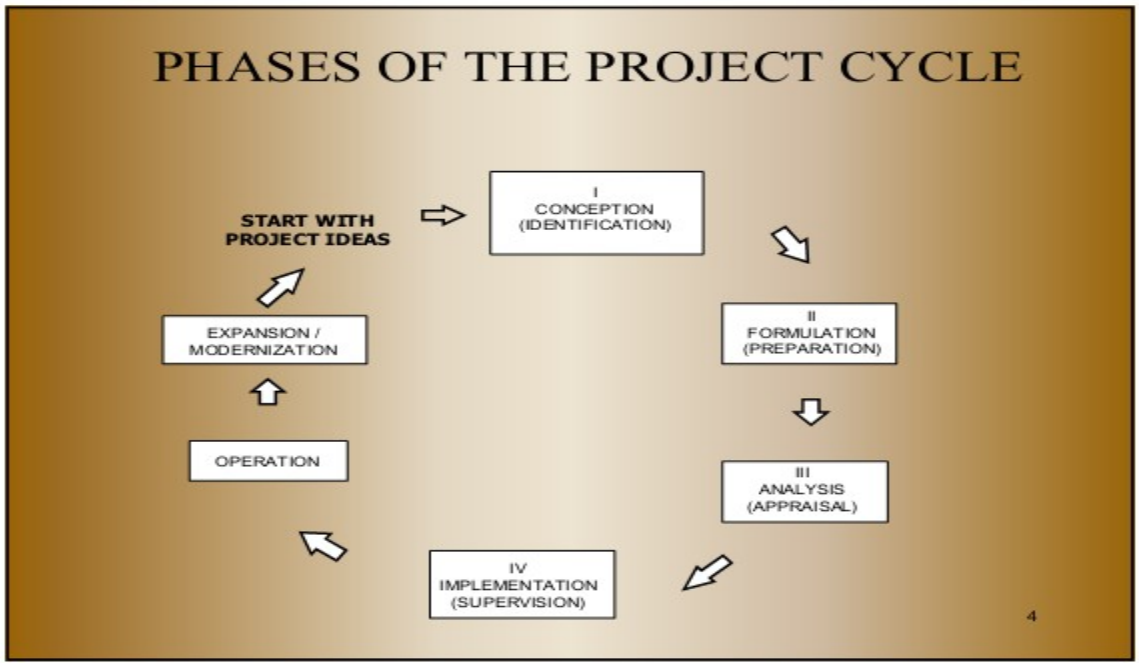
(b) Secondly, the attachment of appropriate prices to the inputs and outputs m order to compute the respective values of costs and benefits,

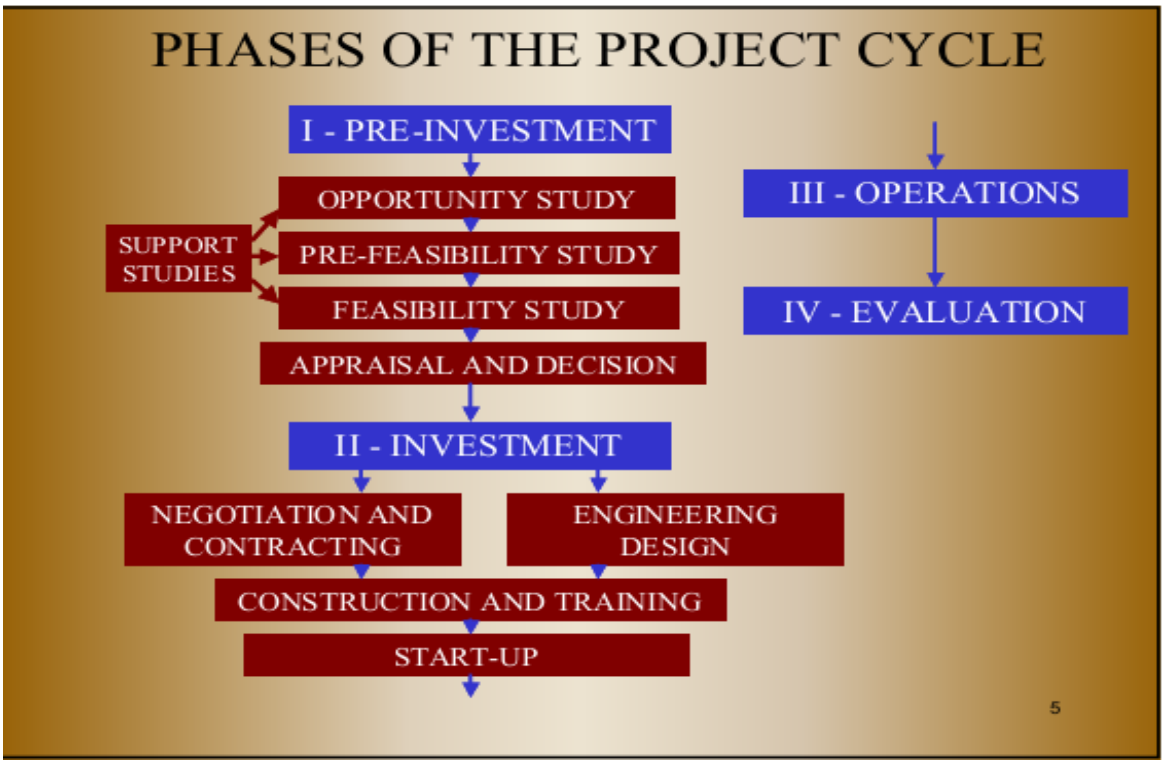
(c) Thirdly, the co measurement of costs and benefits of the project in such a way that facilitates its comparison with alternative projects

Throughout the process of project preparation, evaluation and implementation, many different yet interrelated aspects come into the picture. They are generally of a technical, economic, financial and legal nature, but their relationship is so strongly pronounced that they must all be taken into consideration at any stage of an investment decision. Consequently, the project's preparation, evaluation and finally implementation should be carried out through the team-work of specialists such as engineers, economists, financial analysts and legal experts. The participation of legal experts should save time and resources by ensuring at an early stage that everything envisaged shall be consistent with the laws of a country, and such experts should render the future parameters of a technical, financial and economic nature more certain by proper contracts. The presence of legal experts, probably highly specialized, is especially required if a project involves joint ventures

The entire process leading up to a project's implementation in reality is seldom a clear-cut, step-by-step procedure as described above. In practice, evaluation may reveal that certain aspects of a project have to be re-prepared. Similarly, project implementation may encounter unforeseen difficulties which require both redesigning certain project elements and evaluating the impact of this redesigning on the project's overall merits. The UNIDO

methodology for the Identification, Preparation and Evaluation and Implementation of investment Projects can also be represented in either of the following figures.





CHAPTER TREE

Project Identification

Part I: Project identification

Project identification is the first and, perhaps, the most crucial stage among the rest phases of the project cycle in which it is an opportunity study stage. It is from this perspective that the project will be based, and unnecessary ideas are likely to lead us to mal-project's status. At this stage an initial screening of project ideas will take place, with some project ideas being abandoned as impractical or of a low priority. Ideas for projects can be derived from a range of different sources, such as; government organizations including: Ministries, individuals, local communities', non-government organizations and international donor agencies and others.

Sources of project ideas

One can distinguish two levels where project ideas are born; the macro and micro level. Macro level project ideas: as the name indicates this type of the project ideas can emanate from international level or national level and can have large–scale impact. E.g
Micro level project ideas: this type project idea originates from the smallest household or neighborhood and local level to solve a problem and fill need gaps identified at a small territory level. E.g
Project ideas can be generated formally or informally, by an institution or by individuals.

How to identify projects using the (NPT) model developed By A.K. Noah(2004)

All projects have one common characteristic- the projection of ideas and activities into new endeavors. The ever present element of risk and uncertainty means that the events and tasks leading to completion can never be foretold with absolute accuracy. Projects can originate from several places or perceived needs. The NPT model enables project practitioners to identify projects from three sources.

(1) Needs (N)
(2) Problems (P)
(3) Trend or pattern (T)
It is important for practitioners as well as non practitioners of project management to know that projects revolve around one basic concept "need". Human beings are a bundle of needs.

The need for a new project will usually be pretty well defined before investor institutions will agree to provide the capital needed to build.

1. NEEDS APPROACH

The need for investment in a project, however, generally arises from one of three sources:

- ✓ Market Demand/community demand for social projects
- ✓ Governmental or company mandate
- ✓ Cost reduction strategies

(a) Market demand

- ✓ This includes the development of new products,

- ✓ Seizing opportunities to increase market share of current products
- ✓ Trying to retain current business

(b) Government or Company mandate

- ✓ This includes responding to health,
- ✓ Safety
- ✓ Environmental concerns

(c) Cost reduction strategies

- ✓ This includes project to improve efficiency, such as:
- ✓ Decreasing maintenance or operating costs,
- ✓ Increasing production while holding costs stable

2. PROBLEM SOLVING APPROACH:

All projects are geared towards solving a particular problem or taking advantage of opportunities. Therefore in identifying projects one can start by reviewing problems.
Problems definitely would revolve around the following area

- ✓ Social issues
- ✓ Economic
- ✓ Political
- ✓ Legal
- ✓ Technological
- ✓ etc

Problems are normally deviations from the normal. e.g behavior, increase in drug abuse, project under the category fall under social problems. Project could be developed towards tackling these problems, e.g sensitization, education etc.

Economic problems could include unemployment, poverty, relevant projects in these areas could be developed.

- For e.g demographic factors fall under social, and by looking at issues,like population, age, sex, several problems can be identified and projects can be developed

- Aspect also like education can be reviewed critically and projects will definitely emerge from this factor. E.g .number of teachers, pupil to teacher ratio, number of schools etc

Also where there is a problem there is bound to be an opportunity. Therefore, look for the opportunity. For example if there is a problem

with traffic congestion in Freetown, currently there is a potential for engineering projects for new roads, bridges, etc.

3. TREND APPROACH

Projects can also be identified by monitoring trends e.g

- ✓ Population
- ✓ Economic
- ✓ Educational
- ✓ Health
- ✓ Technology
- ✓ Etc

For e.g increase in birth rate can indicate the likely hood of more schools in the primary and secondary sector, need for more teachers.etc. By monitoring trends we are able to plan for the future.

I) Phases of Project Identification

There are four key phases of project identification. These are:

- **General description of project idea:-** by formal and informal institutions and individuals.
- **General description of project idea:**- actual written description of the specific project idea or concept that summarizes the main elements of the proposed project to use in the screening, ranking and prioritization of project ideas.
- **Screening:**- an initial review of project ideas and concepts to see if they should be advanced or abandoned at an early stage.
- **Prioritization, ranking and selection:**- Projects against a set of criteria to identify the best projects to move actively into the design stage and development.

Projects can be identified by many different agencies depending on the type of project under consideration.

II) How and where do projects come from?

As clearly stipulated in the discussion made in module one, a project is typically undertaken to meet a specific objective. It involves doing

something new, which means that the end result should be a unique product or service. These products may be marketed to external clients, or they may be used internally. But the question is “How and where do projects come from”.

Every project starts with an idea. Where do you think the idea comes from? Does it drop from the sky? No. Is it innate in the mind? No. Obviously an idea comes from people, i.e. individuals, groups, corporations, and even nations. But under what conditions are these most likely to foster new ideas? Projects, by their very nature, have a lot in common. They usually start as an idea. The idea is then developed into a concept. The concept is then analyzed and probed through the process of due diligence (an investigation or audit of a potential investment). Due diligence from the foundation of a project’s feasibility. The first task of the entire project cycle is, thus, identifying the project area.

Project ideas are normally initiated by a perceived need in an organization. That means project ideas can be developed from the identification of unsatisfied community needs. A need is a desire of the project customer that focuses on a business problem; its fulfillment is strategic to organization goals. The problems or constraints may be caused by shortages of essential facilities and material and human resources, unutilized or under-utilized material and human resources and opportunities for their conversion to more productive purposes; and the need to complement other investments (such as providing roads and sanitation to a housing project, provision of training to fill a skill gap etc.) Overall projects are identified in response to a readily apparent community need or a deficiency in the development of the local environment (*Goodman and Love, 1980*).

As indicated earlier one can distinguish two levels where project ideas are born; the macro and micro level.

iii) Project Profile, Prioritization and Ranking

a) Pre-Conditions

Justification and purpose:- What goal is the project contributing to? What is the purpose?

Beneficiaries and Stakeholders:- Who will benefit and who has a share or stake in the project?

Resources and institutions:- What potential resources may be available?

Policies and plans:- How does the project proposal fit into plans and policies at hand,

Impacts:- The likely major positive and negative social and environmental impacts,

Support:- The level of political and administrative support,

Risks:- The main risks.

b) Prioritization and Ranking

At the national level different agencies and divisions within ministries will have their own project ideas and will have to compete for support and resources. To decide which projects to support it will be necessary to set priority. This calls for the ranking of projects.

Criteria for Ranking Projects

a. **Extent:-** Number of people and geographic area affected by the project,
b. **Economic and financial:**- Potential economic and/or financial benefits to nation and local communities.
c. **Environmental:**- Conservation of natural resources and more sustainable land use and protection of natural resources (e.g Forests)
d. **Social :**- Poverty alleviation and assistance to disadvantaged groups
e. **Policy:**- Is the project in line with national polices?

f. **Organizational and human resources:**- Availability of human resources to implement project likely availability of function from government, NGO and/or donors
g. **Success or failures:**- the chances of the project successfully meeting its objectives and the risks associated with the project that may affect its implementation,
h. **Support :**- Political support and Community support and demand for project,

During selection process, each project can be assessed against each of the criteria to give a rating. At this stage of the project cycle it is more likely to be qualitative than quantitative. Certain criteria can be given greater weighting to reflect the importance of the criteria in determining the overall range of the project.

Pre-Feasibility Study

The pre-feasibility study is a preliminary screening of identified projects on the basis of their technical, social, environmental, economic and financial viability. If an opportunity study provides sufficient information, the pre-feasibility stage could be dropped and the feasibility study should be viewed as an intermediate stage between a project opportunity study and a detailed feasibility study. However, the principal objectives of pre-feasibility study are to determine whether:

- All project alternatives have been well-examined;
- A detailed analysis through feasibility study is required;
- Functional or support studies, such as: market surveys, laboratory tests or pilot test are necessary; and
- The available information justifies the viability of investment opportunity. However, the viabilities of all alternatives at this stage are assessed in terms of their costs and benefits to select few viable solutions for further detail study.

The difference between the pre-feasibility and feasibility lies in the degree of detail of information obtained and the depth with which project alternatives are discussed.

Part II: Project Preparation (PP)

Project preparation is a process of carrying out feasibility study, feasibility study result and initial proposal report which will enable to se how feasible and viable the project is.

Feasibility studies aim to objectively and rationally uncover the strengths and weaknesses of an existing business or proposed venture, opportunities and threats present in the environment, the resources required to carry through, and ultimately the prospects for success. In its simplest terms, the two criteria to judge feasibility are cost required and value to be attained.

Feasibility study results with the preliminary project proposal document that contains all the information necessary for an investment decision for the implementing agency. It also critically examines economic and environmental factors affecting projects.

I. Market and Demand Analysis

The objective of conducting market analysis is to assess whether there exists; unsatisfied demand for the product and to determine the share that can be captured by the project through appropriate market strategies. Market appraisal requires a description of the product, its major uses, scope of the market, possible combination from market substitutes, special features of the product with regard to quality and price.

II. Raw materials and supplies study (Input Analysis)

In addition to estimating the existing and future demand and supply of the product, it is important to critically assess the availability of the appropriate inputs needed to produce the proposed product.
The final result of input analysis is estimates of all kinds of inputs by quantities and costs.

III. Technical analysis

The following’s are the general technical aspects:-

- **Technology Package**: Involves the identification and selection of the type of technology applicable for the project.
- **Location:** This signifies the identification and selection of proper site and location for the project by considering compatibility of activities.
- **Scale of operation**: This has a lot to do with the production program and plant capacity (of the project)
- **Land use:** this simply involves the identification of the major land use category up on which the project is in place (commercial, industrial, social, mixed use etc)
- **Recurrent costs:** This involves the process of estimating the regular budget required by the project for a defined duration usually per annum.

IV. Institutional Feasibility

Many institutional constraints can be tackled through good project preparation. Some of the salient factors of this analysis include:-

- Identification of those things which can be controlled and those which can be influenced.
- Sound internal organizational structure, competent management and supervisory personnel;
- Adequate technical skilled personnel and provision of the necessary training facilities
- Effective channels of communication and good relationship with contributing agencies with strong network analysis (e.g national research organizations)
- Realistic implementation schedules and ensures whether policy changes are applicably necessary for effective success of the project. (e.g. water changes in irrigation projects).

V. Social analysis

Social analysis includes the study of demographic, social and cultural characteristics of the population affected by the project and extent of

readiness of the community to accept the cause of the project or to participate in project design and management in case the project is social projects.

Demographic characteristics: Involves the indication of the age structure as well as the sex composition of the section of the population that are directly as a result of the implementation of the project.

Social Organization: Assessing the availability as well as the readiness of social organization for the implementation of the project.

Cultural Acceptability: Involves the assessment of the level of cultural acceptance of the implementation of the project (insuring compatibility of the project with the culture of the community)

Community Participation: It depends on the level and extent of community participation in the various stages of the project from beginning up to its finalization.

VI. Environmental Analysis

Environmental aspects of a project refers to the impact of the project on nature and habitat of earth such as plants and forests, water, air, wild and domestic animals human beings, etc. In environmental impact assessment, the feasibility study discuss in detail the impacts of the proposed projects on the environment and to choose the equipment and production systems that minimizes pollution, soil degradations and others. The feasibility study should include a laboratory details on how to dispose-off the wastes of the project that pollute air and water. There are a number of questions that need to be answered during the analysis, such as:

- What is the impact of the project?: In using renewable resources such as air, water, land, etc; and non-renewable resources like minerals and deposits that deplete through time with more concern of future generations.
- How does the project affect the eco-systems such as soil erosion, atmosphere, rivers, lakes and desertification?

- What is the impact on biological system such as conservation of unique habitat, endangered species, wild life, overgrazing and deforestation?
- What hazardous chemicals are used that will harm the health of employees and surrounding people of the project area? What chemicals and wastes are emitted from the project that will pollute air and water?

VII. Feasibility Study Result and Initial Proposal Report study Results

The research and study projects, undertaken by government and non-governmental organizations, are finalized by producing reports that contain different investment opportunities. Opportunity studies are sketchy in nature and rely more on aggregate estimates than on detailed analysis. Cost data are usually taken from comparable existing projects not from quotations of sources such as equipment suppliers. Hence these reports should provide preliminary information on markets, entrepreneurial input, the business environment and other factors that affect project implementation.

The major outputs of general opportunity studies are to

- Clearly state the problem that we want to address or the opportunity that we want to take advantage of.
- Provide essential information on the external factors influencing the performance of projects.
- Provide background information with emphasis on risks, competitiveness, profitability and other conditions for each opportunity identified in the sector; and enable investors to screen out and select the most attractive opportunities for further analysis. If the opportunity study provides sufficient information, it is possible to pass the pre-feasibility study.

vii) Financial Analysis

The objective of financial analysis is to ascertain whether the proposed project will be financially viable in the sense of being able to meet the burden of servicing debt and whether the proposed project will satisfy

the return expectations of those who provide the capital. While conducting a financial appraisal certain aspects has to be looked into like:

- Investment outlay and cost of project
- Means of financing
- Projected profitability
- Break- even point
- Cash flows of the project
- Investment worthiness judged in terms of various criteria of merit
- Projected financial position

Financial feasibility

In case of a new project, financial viability can be judged on the following parameters:

- Total estimated cost of the project
- Financing of the project in terms of its capital structure, debt equity ratio and promoter's share of total cost
- Existing investment by the promoter in any other business
- Projected cash flow and profitability

The financial viability of a project should provide the following information:[

- Full details of the assets to be financed and how liquid those assets are.
- Rate of conversion to cash-liquidity (i.e. how easily can the various assets be converted to cash?).
- Project's funding potential and repayment terms.
- Sensitivity in the repayments capability to the following factors:
  - Time delays.
  - Mild slowing of sales.

- Acute reduction/slowing of sales.
- Small increase in cost.
- Large increase in cost.
- Adverse economic conditions.

viii) Economic Analysis

Economics is the study of costs- and- benefits. In regard to the feasibility of the study the entrepreneur is concerned whether the capital cost as well as the cost of the product is justifiable vis-à-vis the price at which it will sell at the market place. For example, technically, silver can be extracted from silver bromide, (a chemical used for processing the X-ray and photo films); but, the cost of extraction is so high that it would not be economically feasible to do so. Likewise, until recently cost of harnessing solar power was prohibitively high. This cost-benefit analysis goes into financial calculations for profitability analysis that we discussed under financial analysis. At this stage it is also useful to distinguish between the economic and commercial feasibility; whereas economic feasibility leads one to the unit cost of the product, commercial feasibility informs whether enough units would sell.

Apart from the cost-benefit analysis as above, which we also refer to as private cost benefit analysis, it is also useful to dowhat is known as social-cost-benefit- analysis (SCBA). For example, the entrepreneur may be getting subsidized electricity in which case private cost would be less than social cost. Likewise, exporting units earn precious foreign exchange resulting into social benefits being more than private earnings. Many a time, a project that is worthy on SCBA may find greater favour with the support agencies.

I. What Is a Project Proposal?

A project proposal is a detailed account of a succession of activities meant to solve a certain problem. In order to be successful, the document should: give a logical arrangement of a research idea, demonstrate the importance of the idea, explain the idea's connection to past actions, and express the activities for the intended project.

II.Types of Proposals and Funding Agreements

A proposal is a request for financial support of a research or training project. It is sent to a potential funding source in hopes of receiving funding in the form of a contract, grant, cooperative agreement or other sponsored research vehicle. Proposals (funding requests) come in several forms:

1. **Solicited Proposal:**

A solicited proposal is submitted in response to a request by a funding agency for research or training in a specific subject. The proposal may be in response to a Request for Proposal (RFP) or a Request for Application (RFA). A RFA is a solicitation from a funding agency inviting applications from investigators who are interested in working with the funding agency in designing and carrying out a specific project.

2. **Unsolicited Proposal:**

An unsolicited proposal is a proposal on a subject of interest to the faculty member who makes it, which the targeted funding agency may find of interest as well because it is in an area it is exploring, needs more information on, fits with other areas of its interest, or has suddenly deemed a

priority. Many organizations and foundations consider unsolicited proposals, as do some federal agencies.

3. Renewal:

A competing renewal is a request for additional funding for a project that is currently funded but the period of performance is ending. Competing renewals generally include new work based on the results of the existing grant and are subject to peer review.

4. Resubmission:

A resubmission is an effort to secure funding for a proposal which has been revised in response to critical comments from reviewers when it was previously submitted. Unless otherwise stated specifically in the funding opportunity announcement or RFA, just one resubmission is permitted.

5. Revision:

A revision is a request to an agency for additional support for an existing project to expand the project's scope or to meet unforeseen expenses. (In the case of NIH, the former "competing supplemental application" is now known as a "revision.") A revision may be submitted to request support for a significant expansion of a project's scope or research protocol. An administrative revision, also known as a "supplement," requests additional funding to meet increased costs that are within the scope of the approved application, but these new costs were not foreseen when the new or competing renewal application was submitted.

6. Continuation:

A continuation is a non-competing request for additional funding. The application is not subject to peer review.

If a proposal is accepted, funding may be awarded in one of the following forms, sometimes called "sponsored research vehicles":

Contract or Grant:

Contract: The instrument for supporting an activity that is initiated by the federal government through its agencies, and that performs a specified service or will yield a particular end or product for the government. The funding agency exercises considerable direction and control over the performance and timing of the work. Please note: contractual agreements with other entities, such as corporations and foundations, use terms somewhat differently than the federal government. As always, researchers should consult with ORA about any proposal for any type of funding with any sponsor.

Grant: The instrument for providing support for an activity initiated by the applicant, that falls within the guidelines and priorities of the funding agency.

Although contracts and grants are both legal agreements, a contract differs from a grant in the following ways:

Contracts:

- Government agencies use contracts to procure specific services or products from which they will derive some benefit.
- The agency, not the investigator, establishes the project specifications and therefore exercises more direction over the work.
- Contracts are more likely to include “strings” that benefit the agency – for example, some tangible economic return or some degree of control over patent rights, confidentiality, or publication.

Grants:

- Grants support research, with the goal of increasing knowledge and understanding in a given subject.

For contracts and subcontracts, **negotiations are done by the Office of Research Administration which is the signing authority. Principal investigators do not have the authority to sign for Tufts.**

Cooperative agreement: A cooperative agreement is an undertaking in which the research or training project is jointly administered by the funding agency and the recipient institution

Project Proposal Writing

A project proposal is a detailed description of a series of activities aimed at solving a certain problem. Project proposal is a document designed to present a plan of action, outline the reasons why the action is necessary, and convince the reader to agree with and approve the implementation of the actions recommended in the body of the document.

It is a means of presenting the project to the outside world in a format that is immediately recognized and accepted. The proposal should contain a detailed explanation of the justification of the project; activities and implementation timeline; methodology; and human, material and financial resources required.

Elements of Project Proposal

Although the format and content of a proposal may vary with the requirements of the potential sponsor, the proposal will generally consist of the following elements.

a. **Title page:** A title page should appear on proposals longer than three to four pages. The title page should indicate the project title, the name of the lead organization (and potential partners, if any), the place and date of project preparation and the name of the donor agency to whom the proposal is addressed.
b. **Project title:** The project title should be short, concise, and preferably refer to a certain key project result or the leading project activity. Project titles that are too long or too general fail to give the reader an effective snapshot of what is inside.
c. **Contents page:** If the total project proposal is longer than 10 pages, it is helpful to include a table of contents normally at the start of the document. The contents page enables readers to quickly find relevant parts of the document. It should contain the title and beginning page number of each section of the proposal.
d. **Abstract (Executive summary):** Many readers lack the time needed to read the whole project proposal. It is therefore useful to insert a short abstract or a summary. The abstract provides a brief summary of the project, and in most cases, within a space limitation specified by the sponsor. The abstract should include

the problem to be addressed, the objectives to be achieved, the implementing organization, the key project activities and the total cost (budget) of the project. Although it appears first in the proposal, the abstract should be written last with the thought that it may be the only part of the proposal that is read by some agency reviewers. It should be clear, succinct and effective in generating interest for the project.

e. **Context (Project Impact):** This part of the project should describe the social, economic, political and cultural background from which the project is initiated. It should contain relevant data from research carried out in the project planning phase or collected from other sources. The writer should take into consideration the need for a balance between the length of this item and the size of the overall project proposal. Large amounts of relevant data should be placed in an annex.
f. **Beneficiaries (Target Groups):** In this part define the target group and show how it will benefit from the project. Describe the groups of people that will directly benefit from the project. If applicable and possible, break down the direct beneficiaries into categories (e.g. women, youth, and minorities).
g. **Project justification:** Rationale should be provided for the project. Due to its importance usually this section is divided into four or more sub-sections. These sub-sections are discussed below.

Problem statement: This is the most important part of the proposal because everything revolves around it. It describes the circumstances or conditions that you want to change. The problem statement provides a description of the specific problem(s) the project is trying to solve, in order to "make a case" for the project. Furthermore, the project proposal should point out why a certain issue is a problem for the community or society as a whole, i.e what negative implications affect the target group. There should also be an explanation of the needs of the target group that appear as a direct consequence of the described problem.

Priority needs: The needs of the target group that have arisen as a direct negative impact of the problem should be prioritized. An

explanation as to how this decision was reached (i.e what criteria were used) must also be included. For example, if the problem is stated as "…poor infrastructure in the community", the list of needs associated with this problem may be: (i) improved water supply in quality and quantity; (ii) better roads; and (iii) improved solid waste collection. These three needs would then be given higher or lower priority according to the level of importance for the community, and a description would be given of how that decision was reached (e.g a poll taken from the local population, costs associated with project intervention, etc.). This procedure provides credibility to the selected intervention.

The proposed approach (type of intervention): the project proposal should describe the strategy chosen for solving the problem and precisely how it will lead to improvement. One way to describe the approach related to the need previously stated as improved water supply could be: "intervention to provide basic water supply facilities in the community," with some description of the specific features of the solution proposed.

The implementing organization: This section should describe the capabilities of your organization by referring to its capacity and previous project record. Describe why exactly your organization is the most appropriate to run the project, its connection to the local community, the constituency behind the organization and what kind or expertise the organization can provide. If other partners are involved in implementation provide some information on their capacity as well.

h. **Project Goals and Objectives:** Having a goal is like having a road map. It helps members decide how to get from where they are to where they want to go. Project goals are tools that help members look ahead to plan what they want to do. Often one major "goal" is declared and then broken down into various objectives. Write SMART goal and objectives.
i. **Output (outcomes):** Outputs are the goods, services and change is knowledge and attitudes produced as a result of project activities which contribute to achieving the objective. Outputs describe the services or products to be delivered to the intended

beneficiaries, therefore specifying what the project management is promising to deliver.

j. **Project Description and Background:** This part shall include the specific detailed description of each activity. Activities are the major tasks or steps carried out that lead to achieving the specified outputs. Link the activities to the objectives. Describe every detailed aspect including responsibilities of partners and the institution. There may be more than one activity for every output. All activities should be associated with an output. You should not have any activities that do not link up to outputs. To determine the activities ask: "What does the project need to do in order to produce the desired outputs?" Activities should be clearly defined and when possible, quantified. List only the major activates. You may list up to four activities for each output (you may list fewer than four activities per output).
k. **Human Resources:** This part of the project should describe the management and implementation teams, their experience and responsibilities.
l. **Project feasibility:** This part of the project shows the feasibility of the project.
m. **Sustainability:** Specify how your project will be sustainable in the further after the donation has finished.
n. **Overall project value:** This part shows the added value of the project to the higher education, institution, and other other beneficiaries.
o. **Risks of the project:** This part of the project shall include the main risks (may occur) and the tools could be used to overcome them.
p. **Monitoring and Evaluation (M&E) plan:** In this part specify how you will monitor the progress of activities and how you will be able to evaluate the accomplishment of the overall goal of the project. Identify the indicators you will measure. Use the following table.

Item	**Indicators**	**Sources of verification**	**Assumptions (Risks)**	**M&E**

Overall goal				**Evaluation**
Objective 1 **Objective 2** **Objective 3**				
Outputs **1.1** **1.2** **2.1** **2.2** **2.3**				
Activity 1.1.1 **1.1.2** **1.1.3** **Activity 1.2.1** **1.2.2** **1.2.3** **Activity 3**				**Monitoring**

q. **Implementation Plan:** The implementation plan should describe activities and resource allocation in as much detail as possible. It is exceptionally important to provide a good overview of who is going to implement the project's activities, as well as when and where. The implementation plan may be divided into two key elements; the activity plan and the resource plan.

Activity plan (schedule): The activity plan should include specific information and explanations of each of the planned project activities. The duration of the project should be clearly stated, with considerable detail on the beginning and the end of the project. In general, two

main formats are used to express the activity plan: *a simple table and the Gantt chart.*

Resource plan: The resource plan should provide information on the means necessary to undertaken the project. Cost categories are established at this stage in order to aggregate and summarize the cost information for budgeting.

r. **Project performance indicators:** In this part, specify the major project performance indicators (Measurable project performance indicators)
s. **Reporting:** The schedule of project progress and financial report could be set in the project proposal. Often these obligations are determined by the standard requirements of the donor agency. The project report may be compiled in different versions, with regard to the audience they are targeting.
Dear student, now prepare a small project proposal of your interest and discuss it with your friend(s).

V. Some Tips for Writing and Presenting Proposals:

The following tried and tested tips are to encourage the 100%ers to write more proposals and the low raters to take heart and give it another try.

1. Ask Questions:

Before starting your proposal, take some time to make sure you know exactly what you are proposing. If you are unclear about any part of the project, ask your potential client a few meaningful questions. If anything seems vague in their description of “what they want”, ask for clarification and then give them a list of possible options as to what you think they might have meant. For your sake, when preparing to give a price, it is important that you and the client both have the same amount of work in mind. Note that if you decide to include a list of questions along with your proposal, include an educated guess as to what their answers would be. Make it clear that your price is based on you having made the correct

guesses to the proposed questions and that if anythingneeds clarifying or if anything is missed, you can adjust your quote accordingly.

2. Summarize the Project:

Take all the information on the project that you have received from the client thus far and summarize it briefly, using your own words, in an opening paragraph. This not only helps you get a clearer concept of the project in your own mind but also gives the client confidence that you have given it thought and you understand what they want. It also provides a solid opportunity for them to clarify encase you did not understand.

3. Break Down the Project into a Nice "To Do" List:

After your summary, follow-up with a solid "To Do" list, that is very useful for both you and your client. List everything that they have requested so far as well as your standard work on the project. For designers, this would include listing the initial drafts, etc. For programmers, this would include planning the database, building it, etc. Be thorough in your list. It will help give the client a strong sense that you know what you are doing and that you will do the job well. It will also help you make sure nothing slips through the cracks. Use the list in your project updates and cross things off as you move along.

4. Split the Project into Phases:

After your "to do" list split the project up into a number of clearly defined phases. It is recommended starting out with a minimum of three. Your first phase might be the "Initial First Draft". During this phase, you begin work on the project and end the phase by sending the client a first draft for testing and revision. Your next phase, in a simple 3

phase project, could be “Bug Squashing and Customizing”. During this phase the project is tested and revisions are made until the client is happy with the work and it is ready for action. Your last phase is “Finalization”. Once the work is finished, you send them an invoice, ask for referrals, collect payment, and end with a virtual handshake, all parties satisfied with a job well done. Bonus: A useful strategy to keep in mind when it comes to pricing is splitting up a long to-do list into meaningful project phases and then pricing each of the “phases” individually. This can be especially useful for isolating features that require additional time and energy and being sure the client recognizes the work involved when it comes time to give them the price.

5. Give Your Clients a Timeline:

Once you have gone over the project phases, let your clients know approximately how long you expect the project to take. Be generous (overestimate if need be, but gently) and then strive to finish up ahead of time. While a project may only take you a few hours to finish up, keep in mind that there will be waiting time between the initial drafts and the finished project as the client reviews the work and provides feedback. If the client is in a rush, let them know exactly when it can be finished and be sure to go over in detail exactly what, if anything needs to be done on their part to make that deadline possible.

6. Estimate Your Time Involved:

While not useful for all project types, giving an estimate of time involved is useful for most and not only gives the client a sense of what to expect and that you know what you are doing, but also helps you know exactly what to plan ahead for. A large design/programming project, for example, with a high dollar amount, can be an excellent opportunity to detail the hours involved in each step of the to-do list.

Be generous, but honest. The last thing you want is word getting around that it takes you several hours to do what takes the average freelancer 15 minutes.

7. Use the Multiple Choice Price Strategy:

Now that all the details have been clearly laid out and your client is confident in your understanding of the project and your ability to see it through, it's time to give them the price. Calculate your predicted time involved and be sure that nothing is overlooked. Then, give them the total number of hours along with your standard hourly rate followed by a discounted "flat rate". Let us say you estimate about 5-8 hours involved in the project and your hourly rate is $40 an hour. Your proposal would then read something like this: "At around 5-8 hours of work, you are welcome to my basic hourly rate of $40 an hour or a discounted flat rate of $250." 9 times out of 10 the client will choose the flat rate over the hourly and will be happy with having had the freedom to choose. Note that as an honest freelance artist whose abilities are constantly improving, you will often reach a point where what once took you 5 hours now takes you an hour. Once that happens, the multiple price strategy is no longer needed. Give them your flat rate and do an excellent job. Be sure that, along with your price, you give them your options for accepting payment.

8. Offer a Satisfaction Guarantee:

Once you have given them the price, be sure to include your satisfaction guarantee. Let them know that you are committed to working on the project until they are fully satisfied and then, once they have accepted your proposal, stick to it. There is always the possibility

that it can backfire with a client who just does not ever seem to be satisfied (we can talk about dealing with them another day), but the vast majority of the time a solid guarantee will give your clients an extra vote of confidence and help to close the deal. There is always the possibility of a project costing you more time than it is worth, but no matter. Give the project your absolute best and learn everything that you can. Satisfied customers often end up being repeat customers and they are more than worth the time spent on those who may not appreciate your work.

9. End With a Call to Action:

Finally, after all the details have been made clear, and the price and guarantee given, end with "what happens next." Let them know exactly what they need to do to get started. If you require payment upfront, let them know where to send the money. If everything prior has gone well, you now have a client who is excited and eager to see their project come to life and you want to make sure that they know what needs to happen next.

10. Write and Format Professionally:

Nothing says "unprofessional" like a bunch of "misspellings", grammatical errors, and "IM Style" typing. Take the extra time to proof read your proposal and fix any little errors that may have slipped in. Use spacing between your paragraphs and divide your various sections (Project Summary, Timeline, Price Quote, etc.) with subheadings. For extra points, put your proposal up on a password protected page (make sure the password works) within your website. Remember if you are struggling with style or would just like some extra ideas/opinions,

put together an example proposal and share it with family and friends along with a request for feedback.

Once the proposal has been accepted and the project complete, be sure to always ask the client if they have any suggestions for how you can improve and do even better work in the future. Ask them if your proposal was clear and ask if you were able, what the deciding factor was in choosing you to do the work. Take note of all you learn and apply it to the next proposal you write. Although not directly related to "proposal writing", here are two other tips that are worth mentioning:

1. Pre-Screen your Clients:

To save both you and your client's time and energy, it is important to be sure that they are as informed and as prepared as possible before they contact you. This is where your website can step in and do its job. After they have browsed through your portfolio and decided to go for a price on your services, it is important that you provide a clear path to follow. Create a page specifically for those interested in working with you. Outline the types of projects that you do and the processes that you use. Do not hide your prices. As well as offering an hourly rate and flat rate estimates for various project types, it is better to mention that you are always open to creative negotiations. You can often end up with "free projects" that more than pay what you would have charged them.

2. Respond Quickly:

While not always possible, when you are able to, respond to your prospective and active clients immediately. If you have an expected delay, let them know that you plan to be unavailable. Be punctual with

all your appointments and make sure that you meet your deadlines. If you miss a deadline and you are at fault, take a hit on your earnings. This will let the client know that you mean what you say and it will also help you to make sure it does not happen again.

Part _III

Project Appraisal

Project appraisal: It is clearly not relevant for social service projects, e.g., in which the social services are considered to be “public goods” and provided “free” with the costs being met from general revenues.

For all other types of projects there are four ways to look at financial feasibility from the point of view of:-

- The direct project beneficiaries;
- Projects as a whole;
- Any financial intermediaries; and
- The government.

In general term “Project Appraisal” is a process of selection of a project or prioritizing in their financial viability.

Valuation and evaluation are employed in the process in order to know how much money is required and how effective a project is in comparison to others.

Basic and advanced techniques are employed in carrying out project appraisal.

The basic techniques of project selection and the financial viability appraisal of a project. The basic techniques include:-

- The time value of money,
- Investment criteria which include Net Present Value (NPV), Benefit cost Ratio (BCR), Internal rate of return (IRR) and urgency payback period,
- Project Cash Flows,
- The Cost of Capital,

The advanced techniques of project appraisal includes:-

- Risk Analysis,
- Special Decision situation,
- Social Cost Benefit Analysis,
- Multiple Projects and Constraints,
- Valuation of real Options,
- Judgmental Behavioral Strategic and Organizational considerations.

Comments: *As described above project appraisal and its technique are relevant only for project where goods or services are being charged for, albeit subsidized in one form or the other*

Economic and Financial Analysis

Prior to looking the evaluation techniques used for economic and financial analysis, it is important to make some points on the similarities and differences between economic and financial analysis.

The economic analysis of projects is similar in form to financial analysis: both appraise the profit of an investment. The concept of financial profit is not the same as economic profit. The financial analysis of a project estimates the profit accruing to the project-operating entity or to the project participants, whereas economic analysis measures the effect of the project on the national economy. For a project to be economically viable, it must be financially sustainable, as well as economically efficient. If a project is not financially sustainable, economic benefits will not be realized. Financial analysis and economic analysis are therefore two sides of the same coin and complementary. In addition, both types of analysis are conducted in monetary terms, the major incurred under the project and revenues resulting from it are taken into account. This form of analysis is necessary to assess the degree to which a project will generate revenues sufficient to meet its financial obligations, assess the incentives for producers, and ensure demand or output forecasts on which the economic analysis is based are consistent with financial charges or available budget resources.

Economic analysis attempts to assess the overall impact of a project on improving the economic welfare of the citizens of the country concerned. It assesses a project in the context of the national economy, rather than for the project participants or the project entity that implements the project. Economic analysis differs from financial analysis in terms of both (i) the breadth of the identification and evaluation of inputs and outputs, and (ii) the measure of benefits and costs. Economic analysis includes all members of society, and measures the project's positive and negative impacts in terms of willingness to pay for units of increased consumption, and to accept compensation for foregone units of consumption. Willingness to pay and willingness to accept compensation are used rather than prices actually paid or received because many of the project impacts that are to be included in the economic analysis either will be non-marketed, for example, biodiversity preservation, or incompletely marketed, such as, water supply and sanitation benefits Thus, some form of nonmarket value must be estimated. Many project impacts that are marketed will be bought and sold in markets where prices are distorted by various government interventions, by macroeconomic policies, or by imperfect competition. Shadow prices may be used in estimating the willingness to pay and willingness to accept compensation values in the face of these market absences and market imperfections. Shadow prices are used to take into account the major impacts of a project where economic values differ from financial values. In the two types of analysis costs for various considerations are part and parcels. The notable ones are listed here under.

a) Initial Investment cost

In order to determine or develop the initial budget/cost a project demand, we must forecast what resources the project will require, the required quantity of each, when they will be needed, and how much they will cost-including the effects of potential price inflation. Uncertainty is involved in any forecast, though some forecasts have less uncertainty than others. An experienced cost estimator can forecast the number of bricks the shall be used to construct a brick wall of known dimension with in 1 to 2 percent. In this case the estimator knows almost exactly how many bricks are needed to

build the wall and must simply add the a small allowance for broken or discolored bricks being delivered to the job, plus a few more for bricks broken during construction work.

In many fields, cost estimation methods are well codified. The office walls of organizational purchasing departments are lined with catalogues detailing what materials, services, and machines are available, from whom, and at what prices. And also on the book shelves the volumes devoted to the techniques or estimating the quantities of materials and labor required to accomplish specific jobs. Every business (or simply project) has its own rule of thumb for estimation of its cost and obviously of its initial investment cost.

b) Production cost and Marketing cost

Cost of production per unit is the costs associated with production divided by the number of units produced. The difficulty in calculating the cost of production is usually thought to be in assembling all the costs associated with production and there are volumes written about the correct procedures. However, the question of the relationship of the cost of production to the price of the product (i.e marketing cost) is seldom discussed. One reason for this is the relationship seems very straightforward. In single product enterprises, the cost of production can be compared directly to the price of the product, regardless of the method used to calculate the cost of production.

Determining the relationship between cost of production and the product's price in joint product enterprises is more difficult. A joint product enterprise in one in which two or more products are produced from one production practice and the costs associated with the production of each individual product can not be measured with existing information.

c) Project of Cash Flows

The techniques of computing cash flow equivalence permits to bring competing projects cash flows to a common basis for comparison purpose. Two cash flows that are equivalent at a given interest rate will not be equivalent at different interest rate. For computing projection of cash flows under various factors (e.g compound amount factor, present worth factor, capitalized cost factor etc.) understanding the cash flow conversion factors is vital. Cash flow conversion involves the transfer of project funds from one point in time into another. The following notation is used for the variables involved in the conversion process for the aforementioned factors that shall be dealt following:

i= interest rate, n=number of interest periods, p=a present sum of money. F= a future sum of money, A= a uniform end of period cash receipt of disbursement, G= a uniform arithmetic gradient increase in period by period payment or disbursement.

Now let as see some of the factors with examples;

Compound Amount Factor

The procedure for the single payment compound amount factor finds the future sum of money, F, which is equivalent to a present sum of money, p, at a specified interest rate, I, after n periods. This is calculated as:

$F=P(1+i)^n$

Example:

A sum of 5,000.00 is deposited in a project account and left to earn interest for 15 years. If the interest rate per year is 12%, the compound interest rate after 15 years can be calculated as follows:

$F=5000(1+0.12)^{15}$

$=27,367.85$

Present Worth Factor

The present worth factor computer P when F is given. The present worth factor is obtained by solving for P in the equation for the compound amount factor. That is

$P=F(1+i)^{-n}$

Suppose it is estimated that 15,000.00 would be needed to complete the implementation of a project five years from now, how much should be deposited in a special project fund now so that the fund would accrue to the required 15,000.00exactly five years from now? If the special project fund pays interest at 9.2% per year, the required deposit would be:

$P=15,000(1+0.092)^{-5}$

P=9,660.03

Capitalized cost formula

Capitalized cost refers to the present value of a single amount that is equivalent to a perpetual series of equal end-of-period payments. This is an extension of the series present worth factor with infinitely large number periods. Using the limit theorem from calculus as n approaches infinitely, the series present worth factor reduces to the following formula for the capitalized cost:

P=A/i

Example:

How much should be deposited in a general fund to service a recurring public service project to the tune of 6,500.00 per year forever if the fund yields an annual interest rate of 11%? Using the capitalized cost formula, the required on time deposit to the general fund can be calculated as:

P=A/i

P=6,500/0.11

P=59,090.91

Economic and Financial Evaluation

Financial and economic evaluation techniques can be viewed as a process used for evaluating individual projects or groups of projects and then choosing to implement some set of them so that the objectives of the parent organization are met. As economic and financial evaluation techniques is one major category under project selection model, it is important to see here the broad classification of project selection models.

There are two basic type of project selection models. These are:

i) Nonnumeric models, and
ii) Financial and economic evaluation (Numeric models)

i) Nonnumeric models: Which sometimes referred to as qualitative model as the name implies do not use numbers as inputs. This type is older and simpler. Under this category there is a few subtypes to consider. As such the following sub types of model are identified.

a) The sacred cow: In this case, a senior and powerful official in the organization suggests the project. Often the project is initiated with a simple comment such as “if you have the chance why don’t’ you look starting that project”. And there follows an undeveloped idea for a new product, for the development of a new market, for the design and adoption of a global data base and information system, or for some other project requiring an investment of the firms resources. The immediate result of this ordinary statement of that official is the creation of a “project” to investigate whatever the boss has suggested. The project is sacred in the sense that it will be maintained until successfully conclude, or until the boss, personally, recognizes the idea as a failure and termination.

b) The operating necessity: If a flood is threatening the plant, a project to build a protective dike does not require much formal evaluation, is an example of this scenario. If the project is required in order to keep the system operating, the primary question becomes: Is the system

worth saving at the estimated cost of the project? If the answer to this question is yes, the project will be funded.

c) **The product line extension:** In this case, a project to develop and distribute new products would be judged on the degree to which it fits the firms existing product line, fills a gap, strengthens a weak link, or extends the line in a new, desirable direction. Some times careful calculations of profit are not required. Decision makers can act on their beliefs about what will be the likely impact on the total system performance if the new product is added to the line.

d) **Comparative benefit model:** For this situation assume that an organization has many projects to consider. Senior management would like to select a subset of the projects that would most benefit the firm, but the project do not seem to be easily comparable. For example some projects concern potential new products, some concern changes in the production methods, others concern computerization of certain records, and still others cover a variety of subjects not easily categorized (e.g a proposal for creating a daycare center for employees with small kids). The organization has no formal method of selecting a project, but members of the selection committee think that some projects will benefit the firm more than others even if they have no precise way to define or to measure benefit. The concept of comparative benefit, if not formal model, is widely adopted for selection decision on all sorts or projects.

ii) **Financial and Economic evaluation (Numeric models):** which sometimes are called quantitative, do use numbers and computations, but the criteria being measured may be either subjective or objective. A large majority of all firms using project selection models use profit/profitability as the sole measure of acceptability. Some of these models include:

a) **Pay back period (PBP):** The pay back period for a project is the initial fixed investment in the project divided by the estimated annual cash inflows from the project. The ratio of

these quantities is the number of years required for the project to repay its initial fixed investment. For example, assume project costs 100,000.00 to implement and has annual net cash inflows of 25,000.00. Then, the payback period is calculated as follows:

Pay back period = 100.000.00/25,000.00 = 4 years

This method assumes that the cash inflows will persist at least long enough to pay back the investment, and it ignores any cash inflows beyond the payback period. The method also serves as an inadequate proxy for risk. The faster the investment is recovered, the less the risk to which the firm is exposed.

b) **Average rate of return:** Often mistaken as the reciprocal of the payback period, the average rate of return is the ratio of the average annual profit (ether before or after tax) to the initial or average investment in the project. Because average annual profits are usually not equivalent to net cash inflows, the average rate of return does not usually equal the reciprocal of the payback period. Assume, in the example just given, that the average annual profits are 15,000.00

Average rate of return = 15,000/100,000 = 0.15

Neither of the aforementioned quantitative evaluation methods are recommended for project selection though payback period is widely used and does have a legitimate value for cash budgeting decisions. The major advantages of these models are their simplicity, but neither takes into account the time value of money. Unless interest rates are extremely low and the rate of inflation is nil, the failure to reduce future cash flows or profits to their present value will result in serious evaluation errors**.**

c) **Discounted cash flow:** Also referred to as the **Net Present Value (NPV)** method, the discounted cash flow method determines the net present value of all cash flows

by discounting them by the required rate of return (also known as hurdle rate, cutoff rate) as follows:

$$\text{NPV (project)} = \text{Ao} + \sum_{t=1}^{n} Ft/(1+k)^t$$

Where, Ft= the net cash flow in period t, K=the required rate of return, Ao = initial cash investment (because this is an out flow, it will be negative)

To include the impact of inflation (or deflation) where pt is predicted rate of inflation during period t, we have

$$\text{NPV (project)} = \text{Ao} + \sum_{t=1}^{n} Ft/(1+k+pt)^t$$

Early in the life of the project, net cash flow is likely to be negative, the major out flow being the initial investment in the project, Ao. If the project is successful, however, cash flows will become positive. The project is acceptable if the sum of the net present values of all estimated cash flows over the life of the project is positive. A simple example will suffice for indicating this. Using our 100,000.00 investment with a net cash inflow of 25,000.00 per year for a period of eight years, a required rate of return of 15 percent, and an inflation of rate of 3 percent per year, we have

$$\text{NPV (project)} = 100{,}000.00 + \sum_{t=1}^{8} 25{,}000.00/(1+0.15+0.03)^8 = 1939.00$$

Because the present value of the inflows is greater than the present value of the out flow that is, the net present value is positive the project is deemed acceptable.

d) Internal rate of return (IRR): If we have a set of expected cash inflows and cash outflows, the internal rate of return is the discount rate that equates the present values of the two sets of flows. If at is an expected cash outflow in the period t and Rt is the expected inflow for the period t, the internal rate of return is the value of K that

satisfies the following equation (note that the Ao will be positive in this formulation of the problem):

$$Ao+A_1/(1+k)+A_2/(1+k)^2+....+A_n/(1+k)^n=R_1/(1+k)+R_2/(1+k)^2+....+R_n/(1+k)^n$$

Where, t=1,2,3....,n, The value of k is found by trial and error.

e) **Profitability Index:** Also known as the **Benefit-Cost Ratio (BCR),** the profitability index is the net present value of all future expected cash flows divided by the initial cash investment. (Some firms do not discount the cash flows in making this calculation). If this ratio is greater than 1.0, the project may be accepted.

f) **Break-**even analysis (BEA): Break-even analysis refers to the determination of the balance performance level where project income is equal to project expenditure. The total cost of an operation is expressed as the sum of the fixed and variable costs with respect to output quantity. That is,
TC(X)=FC+VC(x)

Where, x is the number of units produced,

TC(x) is the total cost of producing x units,

FC is the total fixed cost, and VC(x) is the total variable cost associated with producing x units.

In this case the total revenue resulting from the sale of x units is defined as:

TR(x)=px, where p is the price per unit. The profit due to the production and sale of x units of the product is calculated as

P(x0=TR(x)-TC(x)

The break even point of an operation is defined as the value of a given parameter that will result in neither profit nor loss. The parameter of interest may be the number of units produced, the numbers of hours of operation, the number of units of a resource type allocated, or any other measure of interest. At the break even point, we have the following relation ships:

At the breakeven point we have the following relationships:

$$RT(x)=TC(x) \text{or}$$

$$P(x)=0$$

In some cases, there may be known mathematical relationships between cost and the parameter of interests. For example, there may be a linear cost relationship between the total cost of a project and the number of units produced. The cost expressions facilitate straightforward break even analysis.

CHAPTER FOUR

4.1 Project Preparation (PP)

Project preparation is a process of carrying out feasibility study, feasibility study result and initial proposal report which will enable to see how feasible and viable the project is. Feasibility study results with the preliminary project proposal document that contains all the information necessary for an investment decision for the implementing agency. It also critically examines economic and environmental factors affecting projects. In fact, all these aspects of project formulation are interrelated and judgment on one affects judgment on all others.

4.1.2 Project Feasibility study

i) Market and Demand Analysis

The objective of conducting market analysis is to assess whether there exists; unsatisfied demand for the product and to determine the share that can be captured by the project through appropriate market strategies. Market appraisal requires a description of the product, its major uses, scope of the market, possible combination from market substitutes, special features of the product with regard to quality and price.

ii) Raw materials and supplies study (Input Analysis)

In addition to estimating the existing and future demand and supply of the product, it is important to critically assess the availability of the appropriate inputs needed to produce the proposed product.

The final result of input analysis is estimates of all kinds of inputs by quantities and costs.

iii) Technical analysis

The following's are the general technical aspects:-

- **Technology Package**: Involves the identification and selection of the type of technology applicable for the project.
- **Location:** This signifies the identification and selection of proper site and location for the project by considering compatibility of activities.
- **Scale of operation**: This has a lot to do with the production program and plant capacity (of the project)
- **Land use:** this simply involves the identification of the major land use category up on which the project is in place (commercial, industrial, social, mixed use etc)
- **Recurrent costs:** This involves the process of estimating the regular budget required by the project for a defined duration usually per annum.

iv) Institutional Feasibility

Many institutional constraints can be tackled through good project preparation. Some of the salient factors of this analysis include:-

- Identification of those things which can be controlled and those which can be influenced.
- Sound internal organizational structure, competent management and supervisory personnel;
- Adequate technical skilled personnel and provision of the necessary training facilities
- Effective channels of communication and good relationship with contributing agencies with strong network analysis (e.g national research organizations)
- Realistic implementation schedules and ensures whether policy changes are applicably necessary for effective success of the project. (e.g. water changes in irrigation projects).

v) Social analysis

Social analysis includes the study of demographic, social and cultural characteristics of the population affected by the project and extent of readiness of the community to accept the cause of the project or to participate in project design and management in case the project is social projects.

Demographic characteristics: Involves the indication of the age structure as well as the sex composition of the section of the population that are directly as a result of the implementation of the project.

Social Organization: Assessing the availability as well as the readiness of social organization for the implementation of the project.

Cultural Acceptability: Involves the assessment of the level of cultural acceptance of the implementation of the project (insuring compatibility of the project with the culture of the community)

Community Participation: It depends on the level and extent of community participation in the various stages of the project from beginning up to its finalization.

vi) Environmental Analysis

Environmental aspects of a project refers to the impact of the project on nature and habitat of earth such as plants and forests, water, air, wild and domestic animals human beings, etc. In environmental impact assessment, the feasibility study discuss in detail the impacts of the proposed projects on the environment and to choose the equipment and production systems that minimizes pollution, soil degradations and others. The feasibility study should include a laboratory details on how to dispose-off the wastes of the project that pollute air and water. There are a number of questions that need to be answered during the analysis, such as:

- What is the impact of the project?: In using renewable resources such as air, water, land, etc; and non-renewable resources like minerals and deposits that deplete through time with more concern of future generations.
- How does the project affect the eco-systems such as soil erosion, atmosphere, rivers, lakes and desertification?
- What is the impact on biological system such as conservation of unique habitat, endangered species, wild life, overgrazing and deforestation?
- What hazardous chemicals are used that will harm the health of employees and surrounding people of the project area? What chemicals and wastes are emitted from the project that will pollute air and water?

vii) Feasibility Study Result and Initial Proposal Report study Results

The research and study projects, undertaken by government and non-governmental organizations, are finalized by producing reports that contain different investment opportunities. Opportunity studies are sketchy in nature and rely more on aggregate estimates than on detailed analysis. Cost data are usually taken from comparable existing projects not from quotations of sources such as equipment suppliers. Hence these reports should provide preliminary information on markets, entrepreneurial input, the business environment and other factors that affect project implementation.

The major outputs of general opportunity studies are to

- Clearly state the problem that we want to address or the opportunity that we want to take advantage of.
- Provide essential information on the external factors influencing the performance of projects.
- Provide background information with emphasis on risks, competitiveness, profitability and other conditions for each opportunity identified in the sector; and enable investors to screen out and select the most attractive opportunities for further analysis. If the opportunity study provides sufficient information, it is possible to pass the pre-feasibility study.

4.1.2 Initial Project Proposal Report

Initial proposal report writing is a preliminary study result for investment decision and later after appraising the financial analysis proposal, serves as an evidence to request and secure financial sources either by grants or loans to implement a project. A proposal must justify each item in the list of things you want, so that a donor agency can decide if it wants to provide some or all of those things. The project proposal must reflect the background work you have already done and should be logically set out.

Project Proposal Writing

A project proposal is a detailed description of a series of activities aimed at solving a certain problem. It is a means of presenting the project to the outside world in a format that is immediately recognized and accepted. The proposal should contain a detailed explanation of the justification of the project; activities and implementation timeline; methodology; and human, material and financial resources required.

Elements of Project Proposal

Although the format and content of a proposal may vary with the requirements of the potential sponsor, the proposal will generally consist of the following elements.

t. **Title page:** A title page should appear on proposals longer than three to four pages. The title page should indicate the project title, the name of the lead organization (and potential partners, if any), the place and date of project preparation and the name of the donor agency to whom the proposal is addressed.
u. **Project title:** The project title should be short, concise, and preferably refer to a certain key project result or the leading project activity. Project titles that are too long or too general fail to give the reader an effective snapshot of what is inside.
v. **Contents page:** If the total project proposal is longer than 10 pages, it is helpful to include a table of contents normally at the start of the document. The contents page enables readers to quickly find relevant parts of the document. It should contain the title and beginning page number of each section of the proposal.
w. **Abstract (Executive summary):** Many readers lack the time needed to read the whole project proposal. It is therefore useful to insert a short abstract or a summary. The abstract provides a brief summary of the project, and in most cases, within a space limitation specified by the sponsor. The abstract should include the problem to be addressed, the objectives to be achieved, the implementing organization, the key project activities and the total cost (budget) of the project. Although it appears first in the proposal, the abstract should be written last with the thought that it may be the only part of the proposal that is read by some agency reviewers. It should be clear, succinct and effective in generating interest for the project.
x. **Context (Project Impact):** This part of the project should describe the social, economic, political and cultural background from which the project is initiated. It should contain relevant data from research carried out in the project planning phase or collected from other sources. The writer should take into consideration the need for a balance between the length of this

item and the size of the overall project proposal. Large amounts of relevant data should be placed in an annex.

y. **Beneficiaries (Target Groups):** In this part define the target group and show how it will benefit from the project. Describe the groups of people that will directly benefit from the project. If applicable and possible, break down the direct beneficiaries into categories (e.g. women, youth, and minorities).
z. **Project justification:** Rationale should be provided for the project. Due to its importance usually this section is divided into four or more sub-sections. These sub-sections are discussed below.

Problem statement: This is the most important part of the proposal because everything revolves around it. It describes the circumstances or conditions that you want to change. The problem statement provides a description of the specific problem(s) the project is trying to solve, in order to "make a case" for the project. Furthermore, the project proposal should point out why a certain issue is a problem for the community or society as a whole, i.e what negative implications affect the target group. There should also be an explanation of the needs of the target group that appear as a direct consequence of the described problem.

Priority needs: The needs of the target group that have arisen as a direct negative impact of the problem should be prioritized. An explanation as to how this decision was reached (i.e what criteria were used) must also be included. For example, if the problem is stated as "…poor infrastructure in the community", the list of needs associated with this problem may be: (i) improved water supply in quality and quantity; (ii) better roads; and (iii) improved solid waste collection. These three needs would then be given higher or lower priority according to the level of importance for the community, and a description would be given of how that decision was reached (e.g a poll taken from the local population, costs associated with project intervention, etc.). This procedure provides credibility to the selected intervention.

The proposed approach (type of intervention): the project proposal should describe the strategy chosen for solving the problem and precisely how it will lead to improvement. One way to describe the approach related to the need previously stated as improved water supply could be: "intervention to provide basic water supply facilities in the community," with some description of the specific features of the solution proposed.

The implementing organization: This section should describe the capabilities of your organization by referring to its capacity and previous project record. Describe why exactly your organization is the most appropriate to run the project, its connection to the local community, the constituency behind the organization and what kind or expertise the organization can provide. If other partners are involved in implementation provide some information on their capacity as well.

aa. Project Goals and Objectives: Having a goal is like having a road map. It helps members decide how to get from where they are to where they want to go. Project goals are tools that help members look ahead to plan what they want to do. Often one major "goal" is declared and then broken down into various objectives. Write SMART goal and objectives.

bb. Output (outcomes): Outputs are the goods, services and change is knowledge and attitudes produced as a result of project activities which contribute to achieving the objective. Outputs describe the services or products to be delivered to the intended beneficiaries, therefore specifying what the project management is promising to deliver.

cc. Project Description and Background: This part shall include the specific detailed description of each activity. Activities are the major tasks or steps carried out that lead to achieving the specified outputs. Link the activities to the objectives. Describe every detailed aspect including responsibilities of partners and the institution. There may be more than one activity for every output. All activities should be associated with an output. You should not have any activities that do not link up to outputs. To determine the activities ask: "What does the project need to do in order to produce the

desired outputs?" Activities should be clearly defined and when possible, quantified. List only the major activates. You may list up to four activities for each output (you may list fewer than four activities per output).

dd. Human Resources: This part of the project should describe the management and implementation teams, their experience and responsibilities.

ee. Project feasibility: This part of the project shows the feasibility of the project.

ff. Sustainability: Specify how your project will be sustainable in the further after the donation has finished.

gg. Overall project value: This part shows the added value of the project to the higher education, institution, and other other beneficiaries.

hh. Risks of the project: This part of the project shall include the main risks (may occur) and the tools could be used to overcome them.

ii. Monitoring and Evaluation (M&E) plan: In this part specify how you will monitor the progress of activities and how you will be able to evaluate the accomplishment of the overall goal of the project. Identify the indicators you will measure. Use the following table.

Item	**Indicators**	**Sources of verification**	**Assumptions (Risks)**	**M&E**
Overall goal				**Evaluation**
Objective 1 Objective 2				

Objective 3				
Outputs **1.1** **1.2** **2.1** **2.2** **2.3**				
Activity 1.1.1 **1.1.2** **1.1.3** **Activity 1.2.1** **1.2.2** **1.2.3** **Activity 3**				**Monitoring**

jj. **Implementation Plan:** The implementation plan should describe activities and resource allocation in as much detail as possible. It is exceptionally important to provide a good overview of who is going to implement the project's activities, as well as when and where. The implementation plan may be divided into two key elements; the activity plan and the resource plan.

Activity plan (schedule): The activity plan should include specific information and explanations of each of the planned project activities. The duration of the project should be clearly stated, with considerable detail on the beginning and the end of the project. In general, two main formats are used to express the activity plan: *a simple table and the Gantt chart.*

Resource plan: The resource plan should provide information on the means necessary to undertaken the project. Cost categories are established at this stage in order to aggregate and summarize the cost information for budgeting.

kk. Project performance indicators: In this part, specify the major project performance indicators (Measurable project performance indicators)

ll. Reporting: The schedule of project progress and financial report could be set in the project proposal. Often these obligations are determined by the standard requirements of the donor agency. The project report may be compiled in different versions, with regard to the audience they are targeting.

Dear student, now prepare a small project proposal of your interest and discuss it with your friend(s).

4.2 Project Appraisal

Project appraisal: It is clearly not relevant for social service projects, e.g., in which the social services are considered to be "public goods" and provided "free" with the costs being met from general revenues.

For all other types of projects there are four ways to look at financial feasibility from the point of view of:-

- The direct project beneficiaries;
- Projects as a whole;
- Any financial intermediaries; and
- The government.

In general term "Project Appraisal" is a process of selection of a project or prioritizing in their financial viability.

Valuation and evaluation are employed in the process in order to know how much money is required and how effective a project is in comparison to others.

Basic and advanced techniques are employed in carrying out project appraisal.

The basic techniques of project selection and the financial viability appraisal of a project. The basic techniques include:-

- The time value of money,

- Investment criteria which include Net Present Value (NPV), Benefit cost Ratio (BCR), Internal rate of return (IRR) and urgency payback period,
- Project Cash Flows,
- The Cost of Capital,

The advanced techniques of project appraisal includes:-

- Risk Analysis,
- Special Decision situation,
- Social Cost Benefit Analysis,
- Multiple Projects and Constraints,
- Valuation of real Options,
- Judgmental Behavioral Strategic and Organizational considerations.

Comments: *As described above project appraisal and its technique are relevant only for project where goods or services are being charged for, albeit subsidized in one form or the other*

Economic and Financial Analysis

Prior to looking the evaluation techniques used for economic and financial analysis, it is important to make some points on the similarities and differences between economic and financial analysis.

The economic analysis of projects is similar in form to financial analysis: both appraise the profit of an investment. The concept of financial profit is not the same as economic profit. The financial analysis of a project estimates the profit accruing to the project-operating entity or to the project participants, whereas economic analysis measures the effect of the project on the national economy. For a project to be economically viable, it must be financially sustainable, as well as economically efficient. If a project is not financially sustainable, economic benefits will not be realized. Financial analysis and economic analysis are therefore two sides of the same coin and complementary. In addition, both types of analysis are conducted in monetary terms, the major incurred under the project and revenues resulting from it are taken into account. This form of

analysis is necessary to assess the degree to which a project will generate revenues sufficient to meet its financial obligations, assess the incentives for producers, and ensure demand or output forecasts on which the economic analysis is based are consistent with financial charges or available budget resources.

Economic analysis attempts to assess the overall impact of a project on improving the economic welfare of the citizens of the country concerned. It assesses a project in the context of the national economy, rather than for the project participants or the project entity that implements the project. Economic analysis differs from financial analysis in terms of both (i) the breadth of the identification and evaluation of inputs and outputs, and (ii) the measure of benefits and costs. Economic analysis includes all members of society, and measures the project's positive and negative impacts in terms of willingness to pay for units of increased consumption, and to accept compensation for foregone units of consumption. Willingness to pay and willingness to accept compensation are used rather than prices actually paid or received because many of the project impacts that are to be included in the economic analysis either will be non-marketed, for example, biodiversity preservation, or incompletely marketed, such as, water supply and sanitation benefits Thus, some form of nonmarket value must be estimated. Many project impacts that are marketed will be bought and sold in markets where prices are distorted by various government interventions, by macroeconomic policies, or by imperfect competition. Shadow prices may be used in estimating the willingness to pay and willingness to accept compensation values in the face of these market absences and market imperfections. Shadow prices are used to take into account the major impacts of a project where economic values differ from financial values. In the two types of analysis costs for various considerations are part and parcels. The notable ones are listed here under.

d) Initial Investment cost

In order to determine or develop the initial budget/cost a project demand, we must forecast what resources the project will require, the required quantity of each, when they will be needed, and how much they will cost-including the effects of potential

price inflation. Uncertainty is involved in any forecast, though some forecasts have less uncertainty than others. An experienced cost estimator can forecast the number of bricks the shall be used to construct a brick wall of known dimension within 1 to 2 percent. In this case the estimator knows almost exactly how many bricks are needed to build the wall and must simply add the a small allowance for broken or discolored bricks being delivered to the job, plus a few more for bricks broken during construction work.

In many fields, cost estimation methods are well codified. The office walls of organizational purchasing departments are lined with catalogues detailing what materials, services, and machines are available, from whom, and at what prices. And also on the book shelves the volumes devoted to the techniques or estimating the quantities of materials and labor required to accomplish specific jobs. Every business (or simply project) has its own rule of thumb for estimation of its cost and obviously of its initial investment cost.

e) Production cost and Marketing cost

Cost of production per unit is the costs associated with production divided by the number of units produced. The difficulty in calculating the cost of production is usually thought to be in assembling all the costs associated with production and there are volumes written about the correct procedures. However, the question of the relationship of the cost of production to the price of the product (i.e marketing cost) is seldom discussed. One reason for this is the relationship seems very straightforward. In single product enterprises, the cost of production can be compared directly to the price of the product, regardless of the method used to calculate the cost of production.

Determining the relationship between cost of production and the product’s price in joint product enterprises is more difficult. A

joint product enterprise in one in which two or more products are produced from one production practice and the costs associated with the production of each individual product cannot be measured with existing information.

f) Project of Cash Flows

The techniques of computing cash flow equivalence permits to bring competing projects cash flows to a common basis for comparison purpose. Two cash flows that are equivalent at a given interest rate will not be equivalent at different interest rate. For computing projection of cash flows under various factors (e.g compound amount factor, present worth factor, capitalized cost factor etc.) understanding the cash flow conversion factors is vital. Cash flow conversion involves the transfer of project funds from one point in time into another. The following notation is used for the variables involved in the conversion process for the aforementioned factors that shall be dealt following:

i= interest rate, n=number of interest periods, p=a present sum of money. F= a future sum of money, A= a uniform end of period cash receipt of disbursement, G= a uniform arithmetic gradient increase in period by period payment or disbursement.

Now let as see some of the factors with examples;

Compound Amount Factor

The procedure for the single payment compound amount factor finds the future sum of money, F, which is equivalent to a present sum of money, p, at a specified interest rate, I, after n periods. This is calculated as:

$F=P(1+i)^n$

Example:

A sum of 5,000.00 is deposited in a project account and left to earn interest for 15 years. If the interest rate per year is 12%, the compound interest rate after 15 years can be calculated as follows:

$F=5000(1+0.12)^{15}$

$=27,367.85$

Present Worth Factor

The present worth factor computer P when F is given. The present worth factor is obtained by solving for P in the equation for the compound amount factor. That is

$P=F(1+i)^{-n}$

Suppose it is estimated that 15,000.00 would be needed to complete the implementation of a project five years from now, how much should be deposited in a special project fund now so that the fund would accrue to the required 15,000.00exactly five years from now? If the special project fund pays interest at 9.2% per year, the required deposit would be:

$P=15,000(1+0.092)^{-5}$

$P=9,660.03$

Capitalized cost formula

Capitalized cost refers to the present value of a single amount that is equivalent to a perpetual series of equal end-of-period payments. This is an extension of the series present worth factor with infinitely large number periods. Using the limit theorem from calculus as n approaches infinitely, the series present worth factor reduces to the following formula for the capitalized cost:

$P=A/i$

Example:

How much should be deposited in a general fund to service a recurring public service project to the tune of 6,500.00 per year forever if the fund yields an annual interest rate of 11%? Using the capitalized cost formula, the required on time deposit to the general fund can be calculated as:

P=A/i

P=6,500/0.11

P=59,090.91

Economic and Financial Evaluation

Financial and economic evaluation techniques can be viewed as a process used for evaluating individual projects or groups of projects and then choosing to implement some set of them so that the objectives of the parent organization are met. As economic and financial evaluation techniques is one major category under project selection model, it is important to see here the broad classification of project selection models.

There are two basic type of project selection models. These are:

iii) Nonnumeric models, and
iv) Financial and economic evaluation (Numeric models)

iii) Nonnumeric models: Which sometimes referred to as qualitative model as the name implies do not use numbers as inputs. This type is older and simpler. Under this category there is a few subtypes to consider. As such the following sub types of model are identified.

e) The sacred cow: In this case, a senior and powerful official in the organization suggests the project. Often the project is initiated with a simple comment such as “if you have the chance why don’t’ you look starting that project”. And there follows an undeveloped idea for a new product, for the development of a new market, for the design and adoption of a global data base and information system, or for some other project requiring an investment of the firms resources. The immediate result of this ordinary statement

of that official is the creation of a “project” to investigate whatever the boss has suggested. The project is sacred in the sense that it will be maintained until successfully conclude, or until the boss, personally, recognizes the idea as a failure and termination.

f) **The operating necessity:** If a flood is threatening the plant, a project to build a protective dike does not require much formal evaluation, is an example of this scenario. If the project is required in order to keep the system operating, the primary question becomes: Is the system worth saving at the estimated cost of the project? If the answer to this question is yes, the project will be funded.

g) **The product line extension:** In this case, a project to develop and distribute new products would be judged on the degree to which it fits the firms existing product line, fills a gap, strengthens a weak link, or extends the line in a new, desirable direction. Sometimes careful calculations of profit are not required. Decision makers can act on their beliefs about what will be the likely impact on the total system performance if the new product is added to the line.

h) **Comparative benefit model:** For this situation assume that an organization has many projects to consider. Senior management would like to select a subset of the projects that would most benefit the firm, but the project do not seem to be easily comparable. For example some projects concern potential new products, some concern changes in the production methods, others concern computerization of certain records, and still others cover a variety of subjects not easily categorized (e.g a proposal for creating a daycare center for employees with small kids). The organization has no formal method of selecting a project, but members of the selection committee think that some projects will benefit the firm more than others even if they have no precise way to define or to measure benefit. The concept of comparative benefit, if not formal model, is widely adopted for selection decision on all sorts or projects.

iv) **Financial and Economic evaluation (Numeric models):** which sometimes are called quantitative, do use numbers and computations, but the criteria being measured may be either subjective or objective. A large majority of all firms using project selection models use profit/profitability as the sole measure of acceptability. Some of these models include:

g) **Payback period (PBP):** The payback period for a project is the initial fixed investment in the project divided by the estimated annual cash inflows from the project. The ratio of these quantities is the number of years required for the project to repay its initial fixed investment. For example, assume project costs 100,000.00 to implement and has annual net cash inflows of 25,000.00. Then, the payback period is calculated as follows:

Payback period = 100.000.00/25,000.00 = 4 years

This method assumes that the cash inflows will persist at least long enough to pay back the investment, and it ignores any cash inflows beyond the payback period. The method also serves as an inadequate proxy for risk. The faster the investment is recovered, the less the risk to which the firm is exposed.

h) **Average rate of return:** Often mistaken as the reciprocal of the payback period, the average rate of return is the ratio of the average annual profit (ether before or after tax) to the initial or average investment in the project. Because average annual profits are usually not equivalent to net cash inflows, the average rate of return does not usually equal the reciprocal of the payback period. Assume, in the example just given, that the average annual profits are 15,000.00

Average rate of return = 15,000/100,000 = 0.15

Neither of the aforementioned quantitative evaluation methods are recommended for project selection though

payback period is widely used and does have a legitimate value for cash budgeting decisions. The major advantages of these models are their simplicity, but neither takes into account the time value of money. Unless interest rates are extremely low and the rate of inflation is nil, the failure to reduce future cash flows or profits to their present value will result in serious evaluation errors**.**

i) **Discounted cash flow:** Also referred to as the **Net Present Value (NPV)** method, the discounted cash flow method determines the net present value of all cash flows by discounting them by the required rate of return (also known as hurdle rate, cutoff rate) as follows:

NPV (project) = Ao+$\sum_{t=1}^{n} Ft/(1+k)^{t}$

Where, Ft= the net cash flow in period t, K=the required rate of return, Ao = initial cash investment (because this is an out flow, it will be negative)

To include the impact of inflation (or deflation) where pt is predicted rate of inflation during period t, we have

$$\text{NPV (project)} = \text{Ao}+\sum_{t=1}^{n} Ft/(1+k+pt)^{t}$$

Early in the life of the project, net cash flow is likely to be negative, the major out flow being the initial investment in the project, Ao. If the project is successful, however, cash flows will become positive. The project is acceptable if the sum of the net present values of all estimated cash flows over the life of the project is positive. A simple example will suffice for indicating this. Using our 100,000.00 investment with a net cash inflow of 25,000.00 per year for a period of eight years, a required rate of return of 15 percent, and an inflation of rate of 3 percent per year, we have

NPV (project) =100,000.00+ $\sum_{t=1}^{8} 25{,}000.00/(1+0.15+0.03)^{8}=1939.00$

Because the present value of the inflows is greater than the present value of the out flow that is, the net present value is positive the project is deemed acceptable.

j) **Internal rate of return (IRR):** If we have a set of expected cash inflows and cash outflows, the internal rate of return is the discount rate that equates the present values of the two sets of flows. If at is an expected cash outflow in the period t and Rt is the expected inflow for the period t, the internal rate of return is the value of K that satisfies the following equation (note that the Ao will be positive in this formulation of the problem):

$$Ao+A_1/(1+k)+A_2/(1+k)^2+....+A_n/(1+k)^n=R_1/(1+k)+R_2/(1+k)^2+....+R_n/(1+k)^n$$

Where, t=1, 2, 3....,n, The value of k is found by trial and error.

k) **Profitability Index:** Also known as the **Benefit-Cost Ratio (BCR),** the profitability index is the net present value of all future expected cash flows divided by the initial cash investment. (Some firms do not discount the cash flows in making this calculation). If this ratio is greater than 1.0, the project may be accepted.

l) **Break-**even analysis (BEA): Break-even analysis refers to the determination of the balance performance level where project income is equal to project expenditure. The total cost of an operation is expressed as the sum of the fixed and variable costs with respect to output quantity. That is,
TC(X)=FC+VC(x)

Where, x is the number of units produced,

TC(x) is the total cost of producing x units,

FC is the total fixed cost, and VC(x) is the total variable cost associated with producing x units.

In this case the total revenue resulting from the sale of x units is defined as:

TR(x)=px, where p is the price per unit. The profit due to the production and sale of x units of the product is calculated as

P(x0=TR(x)-TC(x)

The breakeven point of an operation is defined as the value of a given parameter that will result in neither profit nor loss. The parameter of interest may be the number of units produced, the numbers of hours of operation, the number of units of a resource type allocated, or any other measure of interest. At the breakeven point, we have the following relationships:

At the breakeven point we have the following relationships:

$$RT(x)=TC(x) \text{or}$$

$$P(x)=0$$

In some cases, there may be known mathematical relationships between cost and the parameter of interests. For example, there may be a linear cost relationship between the total cost of a project and the number of units produced. The cost expressions facilitate straightforward break even analysis.

CHAPTER FIVE

Project Implementation, Monitoring and Evaluation

5.1 What an Organization

The Proud, the Few, the Project Team

When talented athletes play on a basketball team, they all share and support the same goal (to win the game). To this end, the team members generally follow the lead of the coach, and each player does his or her best to fulfill the specific role assigned in each play. Even the stars, like Michael Jordan, must follow the rules of the game. People on your project team need to play their positions in the same way.

For the people working on your project to become a real team, some specific things need to happen with your coaching and leadership as project manager. Project mem-bers need to:

1. Realize that they'll be working on tasks that involve more than one person. Therefore, they'll need to communicate and cooperate with each other to get things done.

2. Share common methods and tools for assessing and communicating the status of the project.

3. Identify and solve problems together—and then live with the results (together).

4. Accept the fact that, if one person messes up, the entire team suffers. Therefore, they need to help each other avoid as many mess-ups as possible.

5. Realize that new people will be joining and other people will be leaving the project as time goes on, but the overall team structure and project goals will re-main the same until the project reaches fruition.

When other organizations or departments are involved, positive interaction between the project manager and these organizations is also critical to creating a good team. The relationships among line, staff, vendor, customer, and project personnel must be tempered with mutual trust.

On Becoming a Team—The Basic Ways to Organize People

Even though infinite possible combinations of people are involved, there are only a few basic ways you can structure the organization of a project. These include func-tional (or line) organizations, pure-project structures, matrix organizations, or mixed organizational structures. These structures may be distributed over multiple locations as well, making the organization more of a virtual team in cyberspace rather than a group of people in a defined location. And as you'd expect, each organiza-tion has its pros and cons.

1. The Functional Project Organization

On a project that uses people from the same organiza-tion, the existing line organization can be used to manage the project. This organizational structure is appropriate when the project is clearly the responsibil-ity of one department. Many small projects use the functional organization as the project organization. A functional project is assigned to the functional department or division in a company that has the most interest and technical ability to complete the project.

Almost all tasks in a project organized as part of a functional organization will be completed within the one functional area. Existing managers in the department double as project managers.

The advantages of using a functional organization to complete a project include:

➤**Familiarity of the team**; The team members are already familiar with each other, and the skill levels of the staff are clearly understood.

➤**Established administrative systems:** The general administrative policies and procedures are already understood by the team and cost centers.

➤**Staff availability:** The staff is readily available to the project because the line managers control the staff assignments. Thus, there are few, if any, interdepartmental conflicts over the use of resources.

➤**Scheduling efficiency:** The scheduling of staff can be highly efficient. As a staff member is required, the person can immediately be assigned to a task and then return to routine work without serious logistical interruptions.

➤**Clear authority:** The lines of authority and communication are understood. Thus, the conflicts between project authority and line authority are minimized.

There are times when an individ-ual has a unique technical skill and must be given a supervisory or leadership role regardless of how difficult this person is to work with. In this situation, you (and the rest of the team) just have to learn to work with the difficult personality to get the job done. This is one of the stan-dard challenges project managers must handle with aplomb.

The disadvantages of using a functional organization include:

➤**Project isolation:** The project may be completed in isolation from other parts of the company and may fail to realize larger strategic goals as a result. However, if new collaboration,

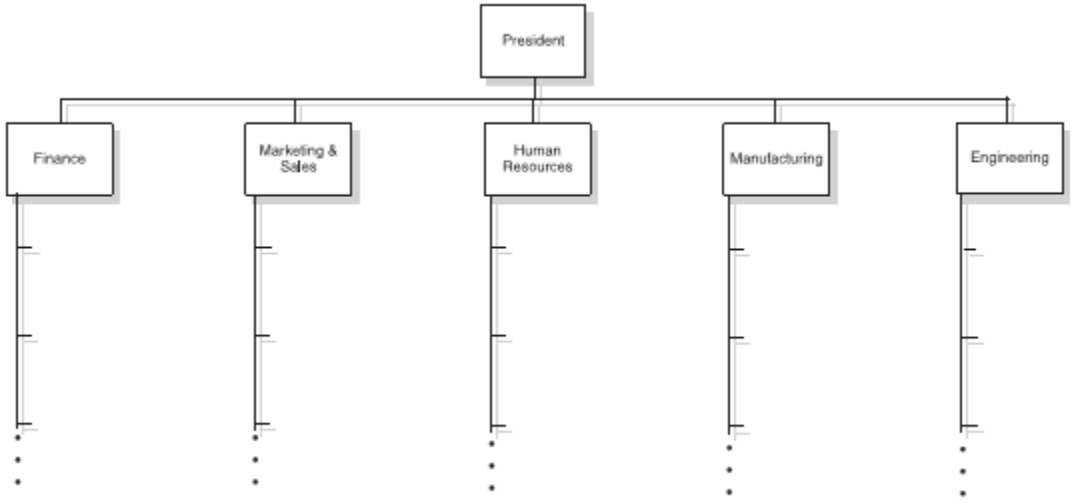
networking, and Web-based tools are employed, this isolation can be minimized.

➤**Limited resources:** The project is limited to the technical resources within the department, which may not be adequate to complete the tasks required. Of course, outside vendors and consultants can be hired, but expertise within other departments of the company is not readily available. This may lead to inefficiencies or redundancies in the project organization.

➤**Bureaucratic procedures:** There may be more levels of approval than really necessary for the project because of the established bureaucracy in the line organization. This may impede progress and slow decision-making.

➤**Lack of project focus:** The project may lack focus or priority in a functional organization because it is not the only work being done. Thus, routine depart-mental work may interfere with project work. In addition, motivation for project work may suffer because the project is considered “additional” or “optional” work as opposed to being a clear responsibility.

➤**Department orientation:** The project may suffer from “department-think.” This occurs when the priorities of the department become the project priorities, regardless of the actual goals for the project. Work outside the department’s nor-mal concerns is given little attention, and the “finished” project may not be complete or may suffer quality problems as a result.



A functional organization.

2.The Pure-Project Organization

In a pure-project structure, a team or “task force” is put together to accomplish the project’s goals. In such an organization, all the team members report to the project manager during the course of the project. The team members do not have responsibility to other managers or jobs during the course of their work on the project. When a team member’s responsibility for the project is complete, the person returns to an-other job or is assigned to another project. Only one project and one job are assigned at a time.

In the direct version of the pure-project structure, every project team member reports directly to the project manager. This is appropriate for small projects with 15 or fewer people involved. In the indirect version of the pure-project structure (suitable for larger projects), the project manager may have assistant managers or supervisors to manage subprojects or functional areas within the project. As in an ordinary line or-ganization, the supervisors and assistants report directly to the project manager, and the various functional teams within the project report to the second-level managers. Extremely large projects may have multiple management levels, just like a corporation.

Pure-project organizations are found in companies fulfilling large government projects or in some engineering-driven companies that

produce predictable model updates for their products. Large construction projects often employ a pure-project organization as well. If work on a complex, priority project spans a year or more, a pure-project organization is often an advantage.

The advantages of the pure-project organization include:

➤**Clear project authority**: The project manager has true line authority over the entire project. Thus, there is always a clear channel for resolving project conflicts and determining priorities. The unity of command in a pure-project organization results in each subordinate having one and only one direct boss—a clear advantage in most situations.

➤**Simplified project communications:** Communication and decision-making within the project are simplified because everyone reports to the same project manager and focuses on the attainment of the same project goals.

➤**Access to special expertise:** If similar projects will be completed by the company on a cyclic basis, specific expertise in the components of the project will be developed over time. It simply becomes a matter of transferring the experts to the right project at the right time.

➤**Project focus and priority:** The pure-project organization supports a total view of the project and a strong, separate identity on the part of the participants.This helps keeps the project focused and integrated.

There are distinct disadvantages to the pure-project approach, however, including:

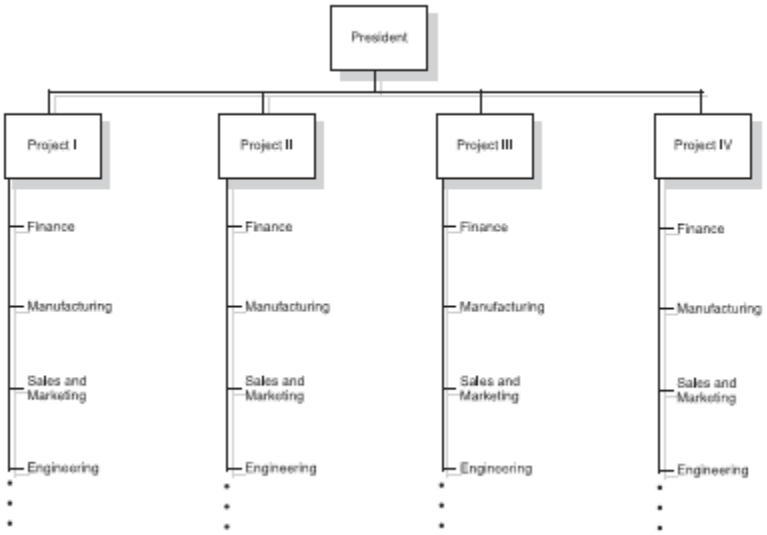
➤**Duplication of efforts:** If a company has multiple projects with important goals in progress at the same time, some efforts may be duplicated, making the overall cost of the projects higher than necessary.

➤**Unclear loyalties and motivations:** Project members form strong attachments to the project and each other, which is good.

When the project is terminated, however, the team must be disbanded, and this leads to uncertainty and conflict. Team members fear layoffs or anticipate assignments in undesirable projects in the future. Thus, keeping technically qualified people happy over the long haul becomes a major challenge.

➤**Intracompany rivalry:** Rivalry and competition may become strong between various projects in a company that uses pure-project organization for its major projects. This results in a company that competes with itself instead of with the competition—an ugly state of affairs.

➤**Uncertain reintegration of resources:** Integrating a pure-project group back into the functional organization can be fraught with problems. People who were involved in the project may be considered “outsiders” when they return to their original jobs, or the jobs may have changed during the course of the project.



A pure-project organiza-tion.

3.The Matrix Organization

Implementing project management techniques sets in motion a significant change in the culture of an organization. One of the more common results of using project management in business is the introduction of “matrix management”—a situation in which people

report to multiple managers. Matrix management involves coordinating a web of relationships that come about when people join the project team and are subject to the resulting multiple authority-responsibility-accountability relationships in the organization.

The matrix organization is an attempt to take advantage of the benefits of a pure project organization while maintaining the advantages of the functional organization. It is rare to find pure-project or pure-functional organizations in business any more. Matrix organizations are typical today, even when other project management tools aren't involved.

In a matrix organization, a clear project team is established that crosses organizational boundaries. Thus, team members may come from various departments. A project manager for each project is clearly defined, and projects are managed as separate and focused activities. The project manager may report to a higher-level executive or to one of the functional managers with the most interest in the project. However, the specific team members still report to their functional departments and maintain responsibilities for routine departmental work in their functional areas. In addition, people may be assigned to multiple project teams with different responsibilities. The problem of coordination that plagues other project structures is minimized because the most important personnel for a project work together as a defined team within the matrix project structure.

The management responsibilities in these projects are temporary—a supervisor on one project may be a worker on another project, depending on the skills required. If project managers in a matrix situation do not have good relationships with line man-agers in the organization, conflicts may arise over authority over employees' work and priorities. Not everyone adapts well to the matrix structure for this and other related reasons.

The complexity that a matrix organization causes is clear: People have multiple man-agers, multiple priorities, and multiple role identities. Because of these complexities, before an organization enters into matrix organizational structures, at least two of the following criteria for the project or the enterprise should be met:

➤A need to share scarce or unique resources that are required in more than one project or functional area

➤A requirement for management to provide high levels of information processing and communication to complete the project

➤Pressure from the outside by customers or agencies to have one person or group centralize control of the project even though the project may be carried out by other groups in the organization

In cases in which projects meet these criteria, the matrix organization has distinct advantages:

➤**Clear project focus:** The project has clear focus and priority because it has its own separate organization and management. Most of the planning and control advantages of a pure-project structure are realized in a matrix organization.

➤**Flexible staffing:** Staffing is relatively flexible in matrix organizations because resources from various line organizations are available without job reassignment. Scarce technical resources are available to a wide range of projects in a company that regularly employs matrix-organized projects.

➤**Adaptability to management needs and skills:** The authority of the project manager can be expansive or limited, depending on the priority of the project. If a project manager has strong authority, he or she has command authority over most of the project. If a project manager has weak authority, the line man-agers have a strong influence on project activities. Thus, the matrix organization can be adapted to a wide range of projects—some that need strong support from line managers and some that require independent management.

➤**Staff development opportunities:** People can be given new challenges and responsibilities that are not as likely to be offered in a purely functional organization. People can gain exposure to new technical areas, develop management skills, and have new experiences that maintain their interest and motivation at work. Ultimately, these new experiences can lead to more effective employees with high degrees of independence and flexibility. And because people tend to be more responsible for the quality of their own work in project-oriented groups, overall corporate productivity can improve.

➤**Adaptability to business changes:** Matrix organizations can adapt more quickly to changing technological and market conditions than traditional, purely functional organizations. This is largely because of the high people-to-people contact in these organizations. In addition, matrix-organized projects en-courage entrepreneurship and creative thinking that crosses functional responsibilities.

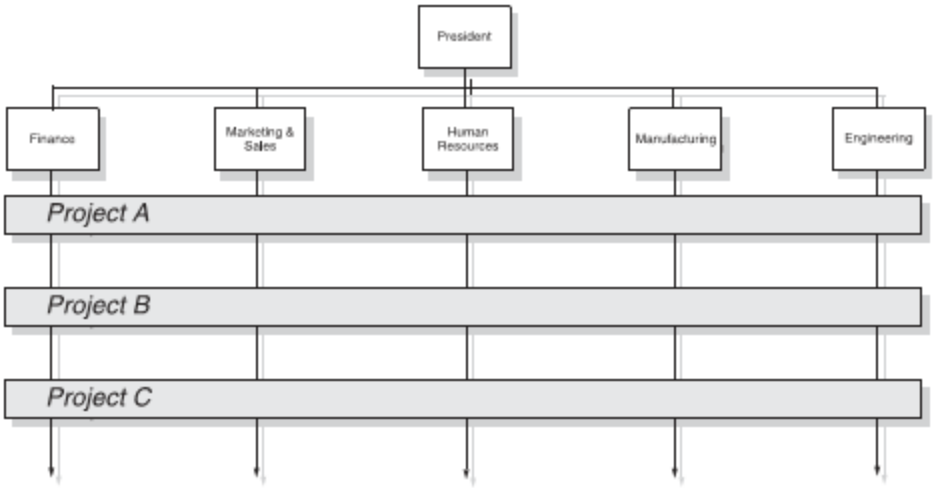
The disadvantages and potential conflicts within a matrix organization must be understood and dealt with to take advantage of the benefits of matrix management. The more frequently reported problems in matrix managed organizations include:

➤**Built-in conflicts:** Conflicts between line management priorities and project management priorities are inevitable. The question of who is in charge affects both the project and routine departmental work. The division of authority and responsibility relationships in matrix organizations is inherently complex. Matrix organizations are no place for intractable, autocratic managers with narrow views of organizational responsibilities.

➤**Resistance to termination:** As in pure-project organizations, team members may prefer their project roles to their line responsibilities, creating interesting motivational challenges for managers. Because the team members have unique identities and relationships in their project roles, matrixed projects often resist termination.

➤**Complex command and authority relationships:** There is no unity of command in a matrix organization—a clear violation of traditional management principles. The team member is often caught between conflicting demands of the line manager and the project manager. The discomfort and uncertainty of having more than one boss at the same time cannot be adequately described to someone who has never experienced the situation. Of course, if the two bosses are adequately trained and are open in their communications, many of these difficulties can be resolved or eliminated.

➤**Complex employee recognition systems:** In a matrix organization, which manager should complete the employee's performance reviews or make recommendations for raises? If the reward responsibilities and authorities of the project manager and the line manager are not clearly identified, the employee may feel unrecognized. It is imperative that both line responsibilities and project responsibilities are accounted for in the employee's performance review process. Some form of reward system needs to be established for team members within the project—whether this is just public acknowledgment of a job well done or formal monetary rewards depends on the project and your budget.



A matrix organization.

4.The Mixed Organization

Some companies employ a mixture of functional, matrix, and pure project organizations to accomplish enterprise goals. In companies with a wide range of projects, a project office may be set up to help administer projects as well. The people in this office provide expertise and assistance in planning and tracking projects. In other companies, the project office may become a division in its own right with full time project managers and staff responsible for project-oriented activities.

When a project has more than one purpose, mixed organizational structures are usually the norm. The space shuttle missions are a perfect example. Getting the astronauts ready for a flight is one project. Building and installing a new robot arm is another. Although someone is responsible for coordinating all the projects and making sure they get done at the same time so the launch can happen as planned, the people are organized on a subproject basis. The subprojects require a completely different set of team members and organizational structures.

Mixed organizations are not distinguishable from most matrix organizations because of the complexity of relationships, and most of the strengths and weaknesses of a matrix organization also apply to a mixed organizational structure. The unique problem in mixed organizations is one caused by the extreme flexibility in the way the organization adapts to project work. This leads to potential incompatibilities, confusion, conflicts, and duplications of effort if the managers are not adequately trained to deal with these complexities.

Which Structure Should You Use?

The organization you choose for most ordinary business projects will probably be an adaptation of a matrix or functional organization. If multiple departments must be involved and the project is outside normal functional responsibilities, then a matrix organization is appropriate. If the project is relatively simple and uses people from one primary department, then a functional organization can work.

Project size, project length, the experience of the team members, the location of the project, and factors unique to the project all have influence on the selection of a project organizational form. For example, on a small, short-term project for creating a newsletter, the organization of the project might be along functional lines that already exist with the involvement of a few outside resources and key vendors to complete specific tasks. On a larger project to design and build the prototypes for next year's luxury car model, however, a matrix organization might be more appropriate because of the wide range of involvement and ongoing communication required across departments of manufacturing, marketing, engineering, and services.

Because large organizations may be distributed over multiple locations, management authority is increasingly being wielded via virtual management tools such as e-mail, computer networks, team collaboration software, and the Web. This is a growing management challenge on large projects, but it's one that will likely continue to evolve to make project teams more virtual and easier to move among multiple project priorities. The trends toward virtual management and just-in-time employment almost dictate matrix-style organizations with local control of basic ad-ministrative services and reporting lines to the project managers for the working as-pects of the jobs.

Be aware that the combination of team players on a task always makes a difference. The combination will work either for you or against you. Both the personalities and the skills need to be complementary, especially on long project tasks in which people are in close proximity. It's important that the sum of the people should always equal more than the total of the individuals.

An organizational structure is a framework of policies and procedures companies use to break their organization into manageable groups. This process involves setting specific job responsibilities, creating a line of authority for managers and creating a decision structure for major business issues or opportunities. A project-style organizational structure is a form companies used based on their functional operations.

Further reading about organization

Reading Assignment

- **Line and staff organization**
- **Divisional organization**

5.2 Project Implementation Planning

After the project has been defined and the project team has been appointed, you are ready to enter the second phase in the project management life cycle: the detailed project planning phase. Project planning is the heart of the project life cycle, and tells everyone involved where you're going and how you're going to get there. The planning phase is where the project plans are documented, the project deliverables and requirements are defined, and the project schedule created. It involves creating a set of plans to help guide your team through the execution and closure phases of the project. The plans created during this phase will help you to manage time, cost, quality, change, risk and related issues. It will also help you manage staff and external suppliers, to ensure that you deliver the project on time and within schedule.

The project planning phase is often the most challenging phase for a project manager, as you need to make an educated guess of the staff, resources and equipment needed to complete your project. You may also need to plan your communications and procurement activities, as well as contract any 3rd party suppliers.

The purpose of the project planning phase is:

- Establish business requirements.
- Establish cost, schedule, list of deliverables and delivery dates.
- Establish resource plan.
- Get management approval and proceed to the next phase.

The basic processes of the project planning are:

1. **Scope planning;** specifies the in-scope requirements for the project and facilitates creating the work breakdown structure.
2. **Preparing the work breakdown structure;** specifies the breakdown of the project into tasks and sub tasks.
3. **Project schedule development**; specifies the entire schedule of the activities detailing their sequence of execution.
4. **Resource planning;** specifies who will do what work at which time of the project and if any special skills are needed to accomplish the project tasks.
5. **Budget planning;** specifies the budgeted cost to be incurred in the completion of the project.
6. **Procurement planning**; focuses on dealing with vendors outside of your company
7. **Risk management planning**; charts the risks, contingency plan and mitigation strategies.
8. **Quality planning**; for quality assurance to be applied to the project.
9. **Communication planning**; on the communication strategy with all project stakeholders.

The planning phase refines the project's objectives gathered during the initiation phase and plans the steps necessary to meet those objectives by further identifying the specific activities and resources required to complete the project. Now that these objectives have been recognized, they must be clearly articulated entailing an in-depth scrutiny of the recognized objective. With such scrutiny, our understanding of the objective will change. Often the very act of trying to describe something precisely gives us a better understanding of what we are looking at. This articulation serves as the basis for the development of requirements. What this means is that after an objective has been clearly articulated (clearly stated) we can go about the business of stipulating in concrete terms what we have to do to achieve it. Obviously, if we do a poor job of articulating the objective,

our requirements will be misdirected and the resulting project will not represent the true need.

Users will often begin describing their objectives in qualitative language. The project manager must work with the user to provide quantifiable definitions to those qualitative terms. These quantifiable criteria include: schedule, cost, and quality measures. In the case of project objectives, these elements are used as measurements to determine project satisfaction and successful completion. Subjective evaluations can be removed with actual numbers.

When articulating the project objectives you should follow the SMART rule:

- Specific (get into the details). Objectives should be specific and written in clear, concise, and understandable terms.
- Measurable (use qualitative language so you know when you are finished). A requirement must have a measurable outcome; otherwise you will not be able to determine when you have delivered it.
- Acceptable (to stakeholders).
- Realistic (in terms of achievement). Objectives that are impossible to accomplish are not realistic and not attainable. Objectives must be centered in reality.
- Time bound (deadlines not durations). Objectives should have a timeframe with an end date assigned to them.

If you follow these principles, you'll be certain that your objectives meet the quantifiable criteria needed to measure success.

1. Scope planning

You always want to know exactly what work has to be done to finish your project BEFORE you start it. You've got a collection of team members, and you need to know exactly what they're going to do to build your product or meet the project's objectives. The scope planning process if the very first thing you do to manage your scope. Project

scope planning is concerned with defining all of the work of the project and only the work needed to successfully meet the project objectives. The whole idea here is that when you start the project, you need to have a clear picture of all the work that needs to happen on your project, and as the project progresses, you need to keep that scope up to date and written down in the project's scope management plan.

1.1 How do you define the scope?

You already got a head start on refining the project's objectives in quantifiable terms, but now you need to go a lot further and write down all of the deliverables that you and your team are going to produce over the course of the project. Deliverables include everything that you and your team produce for the project; anything that your project will deliver. The deliverables for your project include all of the products or services that you and your team are performing for the client, customer, or sponsor. But deliverables include more than that. They also include every single document, plan, schedule, budget, blueprint, and anything else that gets made along the way; including all of the project management documents you put together. Project deliverables are measurable outcomes, measurable results, or specific items that must be produced to consider the project or project phase completed. Deliverables like objectives must be specific and verifiable.

All deliverables must be described in enough detail so that they can be differentiated from related deliverables. For example:

- A twin engine plane versus a single engine plane.
- A red marker versus a green marker.
- A daily report versus a weekly report.
- A departmental solution versus an enterprise solution.

One of the project manager's primary functions is to accurately document the deliverables and requirements of the project and then manage the project so that they are produced according to the agreed upon criteria.

Deliverables describe the components of the goals and objectives in a quantifiable way. Requirements are the specifications of the deliverables.

1.2 Project requirements

After all the deliverables are identified, the project manager needs to discover and document all of the requirements of the project (Figure 1). Requirements describe the characteristics of the deliverable. They may also describe functionality that the deliverable must have or specific conditions the deliverable must meet in order to satisfy the objective of the project. A requirement is an objective that must be met. The project requirements defined in the scope plan describe what a project is supposed to accomplish and how the project is supposed to be created and implemented. Requirements answer the following questions regarding the AS IS and TO BE states of the business: who, what where, when, how much, how does a business process work.

Requirements may include things like dimensions, ease of use, color, specific ingredients, and so on. If we go back to the example of the company producing holiday eggnog; one of the major deliverables is the cartons that hold the eggnog. The requirements for that deliverable may include carton design, photographs that will appear on the carton, color choices, etc.

Requirements specify what the project deliverable should look like and what it should do. They can be divided into six basic categories, functional, non-functional, technical, user, business, and regulatory requirements.

1. Functional requirements

Functional requirements describe the characteristics of the deliverable, what emerges from the project in ordinary non-technical language. They should be understandable to the customers, and the customers should play a direct role in their development. Functional requirements are what you want the deliverable to do.

Example

If you were buying vehicles for a business your functional requirement might be; the vehicle should be able to take a load from a warehouse to a shop.

2. Non-functional requirements

Non-functional requirements specify criteria that can be used to judge the product or service that your project delivers. They are restrictions or constraints to be placed on the deliverable and how to build it. Their purpose is to restrict the number of solutions that will meet a set of requirements. Using the vehicle example; without any constraints, the functional requirement of a vehicle to take a load from a warehouse to a shop, the solutions being ordered might result in anything from a large truck to a sports car! Non-functional requirements can be split into two types: performance and development.

To restrict the types of solutions you might include these performance constraints:

- It must take a load of at least one ton.
- The load area must be covered.
- The load area must have a height of at least 10 feet.

The important point with these examples is that they restrict the number of solution options that are ordered to you by the developer. In addition to the performance constraints you may include some development constraints.

3. Technical requirements

Technical requirements emerge from the functional requirements, they answer the question, and how will the problem be solved this time; will it be solved technologically and/or procedurally. They answer how the system needs to be designed and implemented to provide required functionality and fulfill required operational characteristics. For example, in a software project, the functional requirements may stipulate that a data base system will be developed to allow access to financial data through a remote terminal; the corresponding technical requirements would spell out the architecture of the data structure, the

language in which the database management system will be written, the hardware on which the system will run, telecommunication protocols that should be used and so forth.

4. User requirements

User requirements are what the users need to do with the system or product. They focus on the experience users need to have with the system, they can also reect how the product will be designed, and define how test cases must be formulated.

5. Business requirements

Business requirements are the needs of the sponsoring organization, always from a management perspective. Business requirements are statements of the business rationale for the project. They are usually expressed in broad outcomes the business requires, rather than specific functions the system may perform. These requirements grow out of the vision for the product that, in turn, is driven by mission (or business) goals and objectives.

6. Regulatory requirements

Regulatory requirements can be internal or external and are usually non-negotiable. They are the restrictions, licenses and laws applicable to a product or business, imposed by the government.

An example of requirements

Automated teller machines (ATMs) can be used to illustrate a wide range of requirements. What are some of the physical features of these machines, and what kinds of functions do they perform for users? Why did banks put these systems in place? What high level business requirements did they have in mind?

The following represents one possible example of each type of requirement as they would be applied to a **bank's external ATM**.

- ATM function requirement: The system shall provide users with the ability to select whether or not to produce a hardcopy transaction receipt before completing a transaction.

- ATM non-functional requirement: All displays shall be in white 14 pt Arial text on black back-ground.
- ATM user requirement: The system shall complete a standard withdrawal from a personal account, from login to cash, in less than two minutes for a first time user.
- ATM business requirement: By providing superior service to our retail customers, Monumental Bank's ATM network will allow us to increase associated service fee revenue by 10% annually on an ongoing basis, using a baseline of December 2008.
- ATM regulatory requirement: All ATMs shall connect to standard utility power sources within their civic jurisdiction, and be supplied with uninterruptible power source approved by said company.

The effective specification of requirements is one of the most challenging undertakings project managers face. Inadequately specified requirements will guarantee poor project results.

2. Preparing the work breakdown structure

Now that we have the deliverables and requirements well defined, the process of breaking down the work of the project via a work breakdown structure begins. The work breakdown structure (WBS) defines the scope of the project and breaks the work down into components that can be scheduled and estimated and easily monitored and controlled. The idea behind the work breakdown schedule is simple. You subdivide a complicated task into smaller tasks, until you reach a level that cannot be further subdivided. Anyone familiar with the arrangements of folders and les in a computer memory, or who has researched their ancestral family free, should be familiar with this idea. You stop breaking down the work when you reach a low enough level to perform an estimate of the desired accuracy. At that point, it is usually easier to estimate how long the small task will take and how much it will cost to perform than it would have been to estimate these factors at the higher levels. Each descending level of the WBS represents an increased level of detailed definition of the project work.

As an example, if you want to clean a room, you might begin by picking up clothes, toys, and other things that have been dropped on the floor. You could use a vacuum cleaner to get dirt out of the carpet. You might take down the curtains and take them to the cleaners, then

dust the furniture. All of these tasks are subtasks performed to clean the room. As for vacuuming the room, you might have to get the vacuum cleaner out of the closet, connect the hose, empty the bag, and put the machine back in the closet. These are smaller tasks to be performed in accomplishing the subtask called vacuuming. The diagram below shows you how this might be portrayed in WBS format.

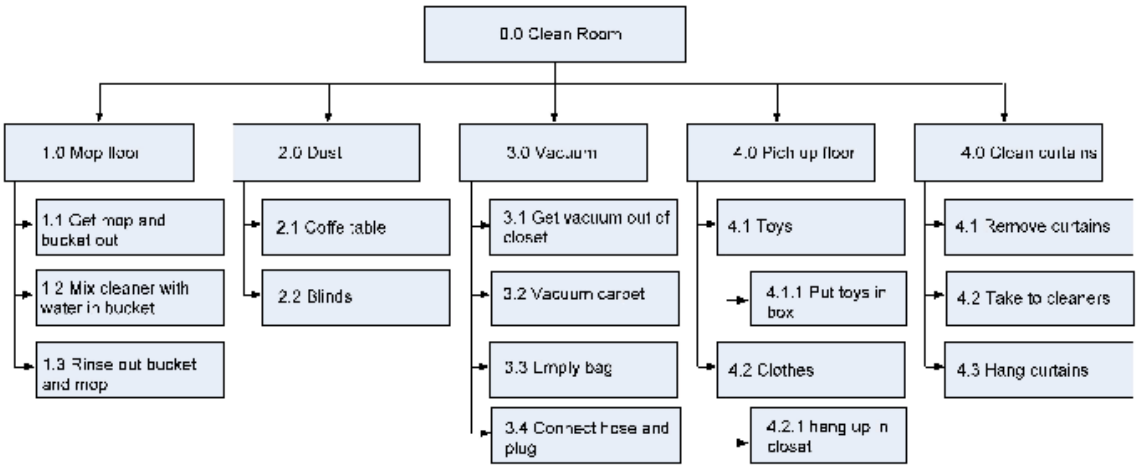


Figure: WBS for cleaning a room.

It is very important to note that we do not worry about the sequence in which the work is performed or any dependencies between them when we do a WBS. That will be worked out when we develop the schedule. The main idea of creating a WBS is to capture all of the tasks, irrespective of their order. So if you find yourself and other members of your team thinking sequentially, don't be too concerned, but don't get hung up on trying to diagram the sequence or you will slow down the process of task identification.

A WBS can be structured any way it makes sense to you and your project. In practice, the chart structure is used quite often (as in the example in the Figure above) but it can be composed in outline (list) form as well.

You'll notice that each element at each level of the WBS is assigned a unique identifier. This unique identifier is typically a number, and it's used to sum and track costs, schedules, and resources associated with WBS elements. These numbers are usually associated with the

corporation's chart of accounts, which is used to track costs by category. Collectively, these numeric identifiers are known as the code of accounts.

There are also many ways you can organize the WBS. For example, it can be organized by either deliverable or phase. The major deliverables of the project are used as the first level in the WBS. Many projects are structured or organized by project phases. Each phase would represent the first level of the WBS and their deliverables would be the next level and so on.

As mentioned earlier, the project manager is free to determine the number of levels in the WBS based on the complexity of the project. You need to include enough levels to accurately estimate project time and costs but not so many levels that are difficult to distinguish between components. Regardless of the number of levels in a WBS, the lowest level in a WBS is called a work package.

Work packages are the components that can be easily assigned to one person, or team of people, with clear accountability and responsibility for completing the assignment. The work package level is where time estimates, costs estimates and resource estimates are determined.

3. Project schedule development

Now were off and running toward the development of our project schedule. In order to develop our schedule, we first need to define the activities, sequence them in the right order, estimate resources and estimate the time it will take to complete the tasks.

The activity definition process is a further breakdown of the work package elements of the WBS. It documents the specific activities needed to fulfill the deliverable detailed in the WBS. These are not deliverables but the individual units of work that must be completed to fulfill the deliverables. Activity definition uses everything we already know about the project to divide the work into activities that can be estimated. You might want to look at all the lessons learned from similar projects your company has done to get a god idea of what you need to do on the current one.

Expert judgment in the form of project team members with prior experience developing project scope statements and WBS can help you define activities. You might also use experts in a particular field to help define tasks if you were asked to manage a project in a new domain; to help you understand what activities were going to be involved. It could be that you create an activity list and then have the expert review it and suggest changes. Alternatively, you could involve the expert from the very beginning and ask to have an activity definition conversation with him before even making your first draft of the list.

Sometimes you start a project without knowing a lot about the work that you'll be doing later. Rolling wave planning lets you plan and schedule only the stuff that you know enough about to plan well. When you don't know enough about a project to come up with a complete activity list, you can use a planning component as a placeholder until you know more. These are extra items put at high levels in the WBS to allow you to plan for the unknown.

Case Study:

Abebe and Nyat have decided to get married, but they don't have much time to plan their wedding. They want the big day to be unforgettable. They want to invite a lot of people and show them all a great time. There's a lot to get done before the wedding day. One of their friends Aman is going to need to figure out what work needs to done before he does anything else. For this he starts to put together a to-do-list.

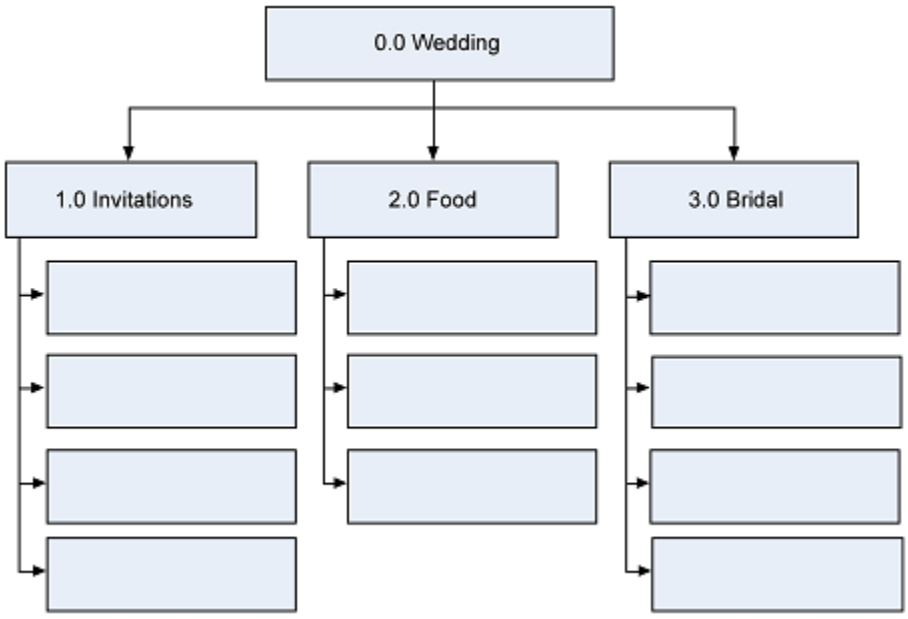
- Invitations
- Flowers
- Wedding Cake
- Dinner Menu
- Band

Since there are so many different people involved in making the wedding go smoothly, it takes a lot of planning to make sure all of the work happens in the right order, gets done by the right people and doesn't take too long. Initially, Aman was worried that he didn't have enough time to make sure everything was done properly. But he knew

that he had some powerful time management tools on his side when she took the job, and they'll help him make sure that everything will work out fine.
To get started, Aman started arranging the activities in a work breakdown structure. This is part of the WBS Aman made for the wedding.

Arrange the following activities into the WBS to show how the work items decompose into activities.

- Shop for shoes
- Create guest list
- Tailoring and fitting
- Shop for dress
- Find caterer
- Cater the wedding
- Wait for RSVPs
- Mail the invitations
- Finalize the menu
- Print the invitations
- Choose the bouquet



Creating the network diagram

The first step in developing the schedule is to develop a network diagram of the WBS work packages. The network diagram is a way to

visualize the interrelationships of project activities. Network diagrams provide a graphical view of the tasks and how they relate to one another. The tasks in the network are the work packages of the WBS. All of the WBS tasks must be included in the network because they have to be
accounted for in the schedule. Leaving even one task out of the network could change the overall schedule duration, estimated costs and resource allocation commitments.

The first step is to arrange the tasks from your WBS into a sequence (Figure below). Some tasks can be accomplished at any time throughout the project where other tasks depend on input from another task or are constrained by time or resources.

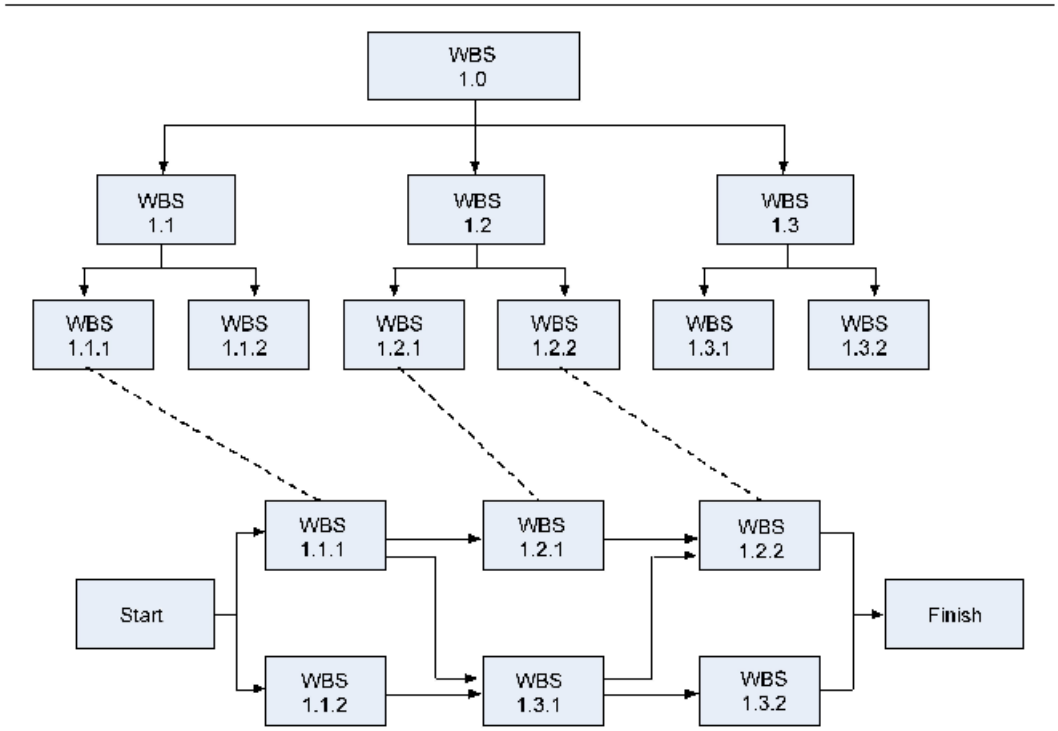


Figure: The relationship between the work breakdown structure (WBS) and the network diagram.

The WBS is not a schedule, but it is the basis for it; the network diagram is a schedule but is used primarily to identify key scheduling information that ultimately goes into user friendly schedule formats, such as milestone and Gantt charts.

The network diagram provides important information to the project team. It provides information about how the tasks are related (Figure 12), where the risk points are in the schedule, how long it will take as currently planned to finish the project, and when each task needs to begin and end.

In our wedding planner example, Aman would look for relationships between tasks and determined what can be done in parallel and what activities needed to wait for others to complete. As an example, the Figure above shows how the activities involved in producing the invitations depend on one another. Showing the activities in rectangles and their relationships as arrows is called a precedence diagramming method (PDM). This kind of diagram is also called an activity on node (AON) diagram.

All network diagrams have the advantages as showing task interdependencies, start and end times, and the critical path (the longest path through the network).

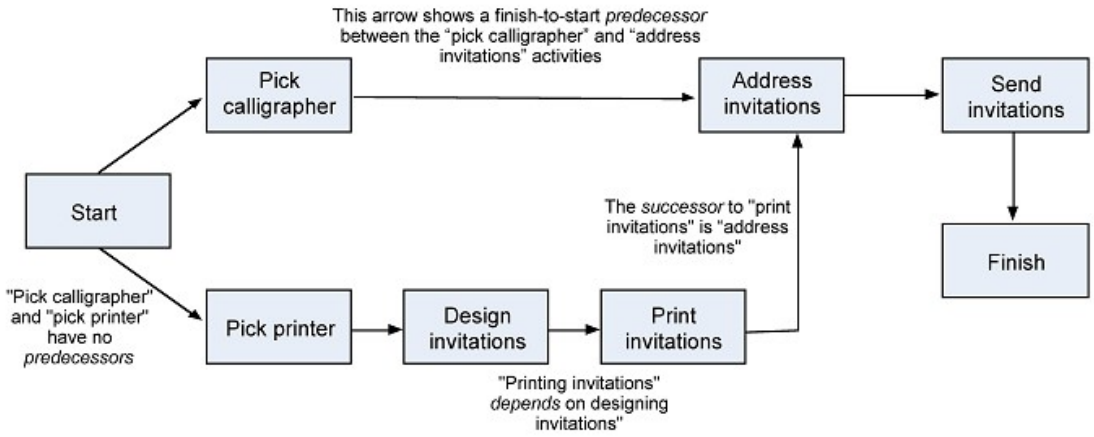


Figure: An example of an activity on node (AON) diagram.

4. Resource planning

In our case study it is clear that Abebe and Nyat have resource problems. Getting a handle on all of the tasks that have to be done is a great start, but it's not enough to know the tasks and the order they come in. Before you can put the final schedule together, you need to know who is going to each job, and the things they need available to them in order to do it!

Resources are people, equipment, locations, or anything else that you need in order to do all of the activities that you planned for. Every activity in your activity list needs to have resources assigned to it. Before you can assign resources to your project, you need to know which ones you're authorized to use; that's called resource availability. Resource availability includes information about what resources you can use on your project and when they're available to you. Don't forget that some resources like consultants or training rooms have to be scheduled in advance, and they might only be available at certain times.

Estimating the resources

The goal of activity resource estimating is to assign resources to each activity in the activity list. There are five tools and techniques for the activity resource estimating process.

- **Expert judgment**; means bringing in experts who have done this sort of work before and getting their opinions on what resources are needed.
- **Alternative analysis**; means considering several different options for how you assign resources. This includes varying the number of resources as well as the kind of resources you use. Many times, there's more than one way to accomplish an activity and alternative analysis helps decide among the possibilities.
- **Published estimating data**; is something that project managers in a lot of industries use to help them figure out how many resources they need. They rely on articles, books, journals, and periodicals that collect, analyze, and publish data from other people's projects.
- **Project management software**; such as Microsoft project will often have features designed to help project managers estimate resource needs and constraints and nd the best combination of assignments for the project.
- **Bottom-up estimating**; means breaking down complex activities into pieces and working out the resource assignments for each piece. It is a process of estimating these individual activities or costs and then adding these up together to come up with a total estimate. Here you estimate every scheduled activity

individually and then roll up that estimate; or add them all together, to come up with a total.

- Bottom-up estimating is a very accurate means of estimating, provided the estimates at the schedule activity level are accurate. However, it takes a considerable amount of time to perform bottom-up estimating because every activity must be accessed and estimated accurately to be included in the bottom-up calculation. The smaller and more detailed the activity, the greater the accuracy and cost of this technique.

Estimating activity durations

Once you're done with activity resource estimating, you've got everything you need to figure out how long each activity will take. That's done in a process called activity duration estimating. This is where you look at each activity in the activity list, consider the scope and the resources and estimate how long it will take to perform. Estimating the duration of an activity means starting with the information you have about that activity and the resources that are assigned to it, and then working with the project team to come up with an estimate. Most of the time you'll start with a rough estimate and then refine it to make it more accurate. You'll use these five tools and techniques to create the most accurate estimates:

- **Expert judgment;** will come from your project team members who are familiar with the work that has to be done. If you don't get their opinion, then there's a huge risk that your estimates will be wrong.
- **Analogous estimating;** is when you look at activities from previous projects that were similar to this one and look at how long it took to do similar work before. But this only works if the activities and the project team are similar!
- **Parametric estimating;** means plugging data about your project into a formula, spreadsheet, database, or computer program that comes up with an estimate. The software or formula that you use for para-metric estimating is built on a database of actual durations from past projects.
- **Three-point estimates;** are when you come up with three numbers: a realistic estimate that's most likely to occur, an

optimistic one that represents the best-case scenario, and a pessimistic one that represents the worst-case scenario. The final estimate is the average.

- **Reserve analysis;** means adding extra time to the schedule (called a contingency reserve or a buffer) to account for extra risk.

Project schedule

The project schedule should be approved and signed off by stakeholders and functional managers. Once the schedule is approved, it will become your baseline for the remainder of the project. Project progress and task completion will be monitored and tracked against the project schedule to determine if the project is on course as planned.

The schedule can be displayed in a variety of ways, some of which are variations of what you have already seen. **Project schedule network diagrams** will work as schedule diagrams when you add the start and finish dates to each activity. These diagrams usually show the activity dependencies and critical path.

The critical path method is an important tool for keeping your projects on track. Every network diagram has something that is called the critical path. It's the string of activities that, if you add up all of the durations, is longer than any other path through the network. It usually starts with the first activity in the network and usually ends with the last one. The reason that the critical path is critical is that every single activity on the path must finish on time in order for the project to come in on time. A delay in any one of the critical path activities will cause the entire project to be delayed.

Knowing where your critical path is can give you a lot of freedom. If you know an activity is not on the critical path, then you know a delay in that activity may not necessarily delay the project. This can really help you handle emergency situations. Even better, it means that if you need to bring your project in earlier than was originally planned,

you know that by adding resources to the critical path will be much more effective than adding them elsewhere.

The schedule can also be displayed using a Gantt chart. Gantt charts are easy to read and commonly used to display schedule activities. Depending on the software you use to display the Gantt chart, it might also show activity sequences, activity start and end dates, resource assignments, activity dependencies, and the critical path. Gantt charts are also known as bar charts.

5. Budget Planning

Every project boils down to money. If you had a bigger budget, you could probably get more people to do your project more quickly and deliver more. That's why no project plan is complete until you come up with a budget. But no matter whether your project is big or small, and no matter how many resources and activities are in it, the process for figuring out the bottom line is always the same.

It is important to come up with detailed estimates of all the project costs. Once this is obtained, add up the cost estimates into a budget plan. It is now possible to track the project according to that budget while the work is ongoing.

A lot of times you come into a project and there is already an expectation of how much it will cost or how much time it will take. When you make an estimate really early in the project and you don't know much about it, that estimate is called a rough order of magnitude estimate (or a ballpark estimate). It's expected that this estimate will become more refined as time goes on and you learn more about the project. Here are some more tools and techniques used to estimate cost:

- **Determine resource cost rates:** People who will be working on the project all work at a specific rate. Any materials you will use to build the project (like wood or wiring) will be charged at a rate too. This just means figuring out what the rate for labor and materials will be.
- **Vendor bid analysis:** Sometimes you will need to work with an external contractor to get your project done. You might even

have more than one contractor bid on the job. This tool is all about evaluating those bids and choosing the one you will go with.

- **Reserve analysis:** You need to set aside some money for cost overruns. If you know that your project has a risk of something expensive happening, better to have some cash lying around to deal with it. Reserve analysis means putting some cash away just in case.
- **Cost of quality:** You will need to figure the cost of all your quality related activities into the overall budget, too. Since it's cheaper to find bugs earlier in the project than later, there are always quality costs associated with everything your project produces. Cost of quality is just a way of tracking the cost of those activities and is how much money it takes to do the project right.

Once you apply all the tools in this process, you will arrive at an estimate for how much your project will cost. It's always important to keep all of your supporting estimate information, too. That way, you know the assumptions you made when you were coming up with your numbers. Now you are ready to build your budget plan.

6. Procurement planning

Procurement management follows a logical order. First, you plan what you need to contract; then you plan how you'll do it. Next, you send out your contract requirements to sellers. They bid for the chance to work with you. You pick the best one, and then you sign the contract with them. Once the work begins, you monitor it to make sure the contract is being followed. When the work is done, you close out the contract and fill out all the paperwork.

You will need to start with a plan for the whole project. You need to think about all of the work that you will contract out for your project before you do anything else. You will want to plan for any purchases and acquisitions. Here's where you take a close look at your needs, to be sure that you really need to create a contract. You figure out what kinds of contracts make sense for your project, and you try to define all of the parts of your project that will be contracted out.

Contract planning is where you plan out each individual contract for the project work. You work out how you manage the contract, what metrics it will need to meet to be considered successful, how you'll pick a seller, and how you'll administer the contract once the work is happening.

The procurement management plan details how the procurement process will be managed. It includes the following information:

- The types of contracts you plan to use, and any metrics that will be used to measure the contractor's performance.
- The planned delivery dates for the work or products you are contracting.
- The company's standard documents you will use.
- How many vendors or contractors are involved and how they will be managed.
- How purchasing may impact the constraints and assumptions of the project plan.
- Coordination of purchasing lead times with the development of the project schedule.
- Identification of prequalified sellers (if known).

The procurement management plan like all other management plans becomes a subsidiary of the project management plan. Some tools and techniques you may use during the procurement planning stage include make or buy analysis and defining the contract type.

7. Risk management planning

Even the most carefully planned project can run into trouble. No matter how well you plan, your project can always run into unexpected problems. Team members get sick or quit, resources that you were depending on turn out to be unavailable, even the weather can throw you for a loop. So does that mean that you're helpless against unknown problems? No! You can use risk planning to identify potential problems that could cause trouble for your project, analyze how likely they'll be to occur, take action to prevent the risks you can avoid, and minimize the ones that you can't.

A risk is any uncertain event or condition that might affect your project. Not all risks are negative. Some events (like finding an easier way to do an activity) or conditions (like lower prices for certain materials) can help your project. When this happens, we call it an opportunity; but it's still handled just like a risk.

There are no guarantees on any project. Even the simplest activity can turn into unexpected problems. Any time there's anything that might occur on your project and change the outcome of a project activity, we call that a risk. A risk is something that may or may not happen ...but if it does, then it will force you to change the way you and your team will work on the project.

When you're planning your project, risks are still uncertain: they haven't happened yet. But eventually, some of the risks that you plan do happen. And that's when you have to deal with them. There are four basic ways to handle a risk.

1. **Avoid:** The best thing that you can do with a risk is to avoid it. If you can prevent it from happening, it definitely won't hurt your project.
2. **Mitigate:** If you can't avoid the risk, you can mitigate it. This means taking some sort of action that will cause it to do as little damage to your project as possible.
3. **Transfer:** One effective way to deal with a risk is to pay someone else to accept it for you. The most common way to do this is to buy insurance.
4. **Accept:** When you can't avoid, mitigate, or transfer a risk, then you have to accept it. But even when you accept a risk, at least you've looked at the alternatives and you know what will happen of it occurs. If you can't avoid the risk, and there's nothing you can do to reduce its impact, then accepting it is your only choice.

By the time a risk actually occurs on your project, it's too late to do anything about it. That's why you need to plan for risks from the beginning and keep coming back to do more planning throughout the project. The risk management plan tells you how you're going to handle risk in your project. It documents how you'll access risk on the project, who is responsible for doing it, and how often you'll do risk

planning (since you'll have to meet about risk planning with your team throughout the project.)

8. Quality planning

It's not enough to make sure you get it done on time and under budget. You need to be sure you make the right product to suit your stakeholders' needs. Quality means making sure that you build what you said you would and that you do it as efficiently as you can. That means trying not to make too many mistakes and always keeping your project working toward the goal of creating the right product!

Everybody ‘knows’ what quality is. But the way the word is used in everyday life is a little different that how it is used in project management. Just like the tripe constraint, scope, cost, and schedule- you manage quality on your project by setting goals and taking measurements. That's why you need to understand the quality levels your stakeholders believe are acceptable, and that your projects meet those targets; just like it needs to meet their budget and schedule goals.

- **Customer satisfaction**; is about making sure that the people who are paying for the end product are happy with what they get. When the team gathers requirements for the specification, they try to write down all of the things that the customers want in the product so that you know how to make them happy. Some requirements can be left unstated, too. Those are the ones that are implied by the customer's explicit needs. For example: some requirements are just common sense, like a product that people hold can't be made from toxic chemicals that kill you. It might not be stated, but it's definitely a requirement!
- **Fitness to use;** is about making sure that the product you build has the best design possible to fit the customer's needs. Which would you choose: a product that's beautifully designed, well constructed, solidly built and all around pleasant to look at but does not do what you need, or a product that does what you want despite being really ugly and hard to use? You'll always choose the product that fits your needs, even if it's seriously limited. That's why it's important that the product both does what it is

supposed to do and does it well. For example: you could pound in a nail with a screwdriver, but a hammer is better fit for the job.

- **Conformance to requirements;** is the core of both customer satisfaction and fitness to use, and is a measure of how well your product does what you intend. Above all, your product needs to do what you wrote down in your requirements document. Your requirements should take into account what will satisfy your customer and the best design possible for the job. That means conforming to both stated and implied requirements.

In the end, your product's quality is judged by whether you built what you said you would build. Quality planning focuses on taking all of the information available to you at the beginning of your project and figuring out how you will measure your quality and prevent defects. Your company should have a quality policy that tells how it measures quality across the organization. You should make sure your project follows the company policy and any governmental rules or regulations on how you need to plan quality for your project.

9. Communication planning

Communications management is about keeping everybody in the loop. Have you ever tried talking to someone in a really loud, crowded room? That's what running a project is like if you don't get a handle on communications. The communications planning process concerns defining the types of information you're going to deliver, to whom, the format for communicating the information and when. It turns out that 90% of a project manager's job is spent on communication so it's important to make sure everybody gets the right message at the right time.

The first step in defining your communication plan is figuring out what kind of communication your stakeholders need from the project so that they can make good decisions. This is called the communications requirements analysis. Your project will produce a lot of information; you don't want to overwhelm your stakeholders with all of it. Your job here is to figure out what they feel is valuable. Communicating valuable information doesn't mean you always paint a rosy picture. Communications to stakeholders may consist of either good news or

bad news- the point is that you don't want to bury stakeholders in too much information but give them enough so that they're informed and can make appropriate decisions.
Communications technology has a major impact on how you can keep people in the loop. This examines the methods (or technology) used to communicate the information to, from and among the stakeholders. Methods of communicating can take many forms, such as written, spoken, e-mail, formal status reports, meetings, online databases, online schedules, project websites and so forth. You should consider several factors before deciding what methods you'll choose to transfer information. The timing of the information exchange or need for updates is the first factor. It's a lot easier for people to get information on their projects if it's accessible through a web site, than if all your information is passed around by paper memos. Do you need to procure new technology or systems, or are there systems already in place that will work? The technologies available to you will definitely figure into your plan of how you will keep everyone notified of project status and issues. Staff experience with the technology is another factor. Are there project team members and stakeholders experienced at using this technology, or will you need to train them? Finally, consider the duration of the project and the project environment. Will the technology you're choosing work throughout the life of the project or will it have to be upgraded or updated at some point? And how does the project team function? Are they located together or spread out across several campuses or locations? The answers to these questions should be documented in the communication plan.

All projects require sound communication plans, but not all projects will have the same types of communication or the same methods for distributing the information. The communication plan documents the types of information needs the stakeholders have, when the information should be distributed and how the information will be delivered.

The type of information you will typically communicate includes project status, project scope statements, and scope statement updates, project baseline information, risks, action items, performance

measures, project acceptance and so on. What's important to know now is that the information needs of the stakeholders should be determined as early in the planning phase of the project management lifecycle as possible so that as you and your team develop project planning documents, you already know who should receive copies of them and how they should be delivered

10. Bringing it all together

Believe it or not, we have officially completed the planning phase of the project management lifecycle. The project plan is the approved, formal, documented plan that's used to guide you throughout the project execution phase. The plan is made up of all the processes of the planning phase. It is the map that tells you where you're going and how to perform the activities of the project plan during the project execution phase. It serves several purposes; the most important of which is tracking and measuring project performance. The project plan is critical in all communications you'll have from here forward with the stakeholders, management, and customers. The project plan encompasses everything we talked about up to now and is represented in a formal document or collection of documents. This document contains the project scope, deliverables, assumptions, risks, WBS, milestones, project schedule, resources, communication plan, the project budget and any procurement needs. It becomes the baseline you'll use to measure and track progress against. It is also used to help you control the components that tend to stray away from the original plan so you can get them back on track.

The project plan is used as a communication and information tool for stakeholders, team members and the management team. They will use the project plan to review and gauge progress as well. Your last step in the planning phase is obtaining sign-oof the project plan from stakeholders, the sponsor and the management team. If they've been an integral part of the planning processes all along (and I know you know how important this is), obtaining sign-off of the project plan should simply be a formality.

5.3 PRE-REQUISITES FOR SUCCESSFUL IMPLEMENTATION OF PROJECT

1. **ADEQUATE FORMULATION**
   - Cursory assessment of input requirement
   - Superficial field investigation
   - Slip- shod method used for estimating cost and benefits.
   - Omission of project linkages
   - Flawed judgment because of lack of experience and expertise
   - Deliberate over -estimation of benefits and underestimation of benefits.
2. **SOUND PROJECT ORGANIZATION**
   - It is led by a competent leader who is accountable for project performance
   - The authority of the project leader and his team is commensurate with their responsibility.
   - Adequate attention is given to the human side of the project system and method is clearly defined.
3. **PROPER IMPLEMENTATION OF PLANNING**
   - Develop a comprehensive plan for various activities like land acquisition, tender evaluation, recruitment of personnel, construction of building etc.
   - Estimate meticulously the resource requirement (manpower, materials, money etc.) For each period to realize the time plan.
   - Define properly the inter linkages between activities of the project.
   - Specify cost standards.
4. **ADVANCED ACTION**

When the project appears prima facie to be viable and desirable, advance action on the following activities may be initiated:

(i) Acquisition of land.

(ii) Securing essential clearances,

(iii) Identifying technical collaborators/consultants,

(iv) Arranging for infrastructure facilities,

(v) Preliminary design and engineering, and

(vi) Calling of tenders

5. TIMELY AVAILABILITY OF FINDS

Once a project is approved, adequate funds must be made available to meet its requirements as per the plan of implementation- it would be highly desirable if funds are provided even before the final approval to initiate advance action. Piecemeal, ad-hoc, and niggardly allocation, with undue rigidities, can impair the maneuverability of the project team.

6. JUDICIOUS EQUIPMENT TENDERING AND PROCUREMENT

1. To minimize time over-runs, it may appear that a turnkey contract has obvious advantages. Since these contracts are likely to be bagged by the foreign suppliers, when global tenders are floated, a very important question arises.

2. A judicious balance must be sought which moderates the outflow of foreign exchange and provides reasonable fillip to the development of indigenous technology.

7. BETTER CONTRACT MANAGEMENT

The competence and capability of all contractors must be ensured one weak link can jeopardize the timely performance of contract.

- Proper discipline must be inculcated among contractors and suppliers by insisting that they should develop realistic and detailed resource and time plans which are congruent with the project plan.

- Penalties which may be graduated must be imposed or failure to meet contractual obligations. Likewise
  incentives may be offered for good performance.

- Help should be extended to contractors and suppliers when they have genuine problems they should be regarded as partners in common pursuit.

- Project authorities must retain latitude off load contracts(partially or wholly)to other parties well in time where delays are anticipated.

8. EFFECTIVE MONITORING

In order to keep a tab on the progress of the project, a system of monitoring must be established. This helps in:

- Anticipating deviation from implementation plan.
- Analyzing immerging problem.
- Taking corrective action.
- It should focus sharply on the critical aspect of project implementation
- It must lay more emphasis on physical milestones and not on financial targets.
- It must be kept relatively simple. If made overcomplicated, it may lead to redundant paper work and diversion of resources. Even worse, monitoring may be viewed as an end in itself rather than as a means to implement the project successfully.

CHAPTER SIX AND SEVEN

Social Cost Benefit Analysis

Advanced techniques of project appraisal and project financing

Advanced techniques refer to the instruments that are used in project decision making (Link Social Cost benefit analysis, Risk analysis and special decision situation). These are termed advanced because they are a bit advanced to consider profit only like that of financial evaluation techniques dealt above. Let us now consider each one by one here under.

i) Social Cost Benefit Analysis (SCBA)

The social cost benefit analysis (SCBA) is primarily used for public investments from the point of view of society or

economy as a whole. The social cost benefit consideration is important particularly for developing countries where governments have played a significant role in the economic development.

The tactical decision making within the frame work of broad strategic choices defined by planning at the Macro level is made through the social cost benefit analysis (SCBA). The social cost benefit analysis is addressed through one of the following ten sections:-

(a) **Rational for SCBA:** The rationale behind social cost benefit analysis (SCBA) is maximizing the benefit of the public at large. Hence the major focus point and emphasis is on addressing (insuring) the issue of social benefits.

(b) **UNIDO approach:** Under UNIDO approach the following major steps are employed

- Calculate financial profitability,

- Obtain net economic benefit,

- Adjust for the impact on saving and investment,

- Adjust for the impact on income distribution,

- Adjust for the impact on merit goods and demerit goods, whose social values differ from the economic values,

(c) **Net Benefit Items of Economic (Efficiency) Prices:** This is revealed through estimating gains or losses to a group. In other words, it is physical resource which is a difference between the shadow price and the market price or a financial transaction which is a difference between the price paid and value received.

(d) **Saving Impact and its Value:** Here a detail analysis will be mad in relation to the practice of saving and its value or the public at large. This analysis answers “What would be its effect on saving? And what is the value of such saving to the society?

(e) **Income distribution Impact:** In addition to tax, subsidy and transfer measures of the government, investment projects are also considered as investment for income redistribution.

(f) **Adjustment for merit and demerit goods:** The merit goods are those goods whose social value exceeds the economic value while the demerit goods are the opposite. The following procedure is employed:

- (a) estimate the economic value;

-(b) ratio social value to economic value (factor);

-(c) multiply the factor by economic value which is an adjustment; and

-(d) add the adjustment to the NPV.

(g) **Shadow prices:** Estimated price of goods or services for which no market price exists.

(h) **SCBA by Financial Institutions:** Financial point of view they also scrutinize from social point of view.

(i) **Public Sector Investment Decision Procedure of the Nation:** Public sector investment are financed and owned by the government. Accordingly respective governments have their own long term and short term strategic plans. In Ethiopia we have five years “The Growth and Transformation plan”, which is now on its end. Every public sector is expected to plan for projects within the frame work of the five years national plan. There are also own financed sectors like municipalities and public enterprises. The project plan of these sectors is approved by the respective town’s council or board of managements.

(ii) **Risk Analysis:** Many consider looking at a project in isolation is a very narrow approach to project evaluation. The critics of the “project risk” approach fall into two groups. The first group argues that the risk of a project must be judged in the context of

the total risk of the firm. This means “what is the incremental contribution of the project to the risk exposure of the firm as a whole”. To answer this question portfolio theory is employed.

Portfolio investment is not directly involved in investment, but it is indirect and is involved with the financial market like stock market, Treasury bill, share holders ...., which has an indirect impact on the economy. On the other hand Foreign direct Investment (FDI) is a direct investment that produces goods. The FDI is preferred by the developing countries.

The second group takes an even broader view of risk and argued that the risk of a project must be judged in the context of the aggregate market portfolio of all assets. In theory, market risk is the most relevant measure of risk.

(iii) **Special Decision Situation:**

Special decision situation as an advanced project appraisal technique involves the assessment of optimal timing and economic life.

a) **Optimal Timing:** In real life, an investment is rarely a “now or never” proposition. Typically it can be undertaken now or at some point of time in the future.

For optimal timing the following procedure is used:

(1) Examine alternative dates (t),
(2) Estimate the net future value of each alternative and convert into present value; and
(3) Choose the timing that has the highest present value.

b) **Economic Life:** Here we make a decision depending up on the length of replacement period. The physical life is the number of years it can be used in actual, while the economic life is the optimal life; period after which the asset would be replaced to minimize operational and maintenance cost.

Accordingly;

UAE (TC) = UAE (OM) + UAE (CC)

Where: UAE = Uniform Annual Equivalent

TC= Total Cost

OM = Operation and Maintenance Cost

CC= Capital Cost

The economic life is where the total cost Uniform Annual Equivalent is a minimum.

ii) **Project Financing**

Once the project appraisal process is completed and the project investment is decided it will automatically be financed.

a) **Major sources of Project financing:**

There are two major project financing source categories. These are:

i) Equity financing; and

ii) Loan financing or Debt financing.

Equity financing: Refers to a project fiancé source category, whereby fund for financing the project is taken from own source. Equity funds may include locally registered unit trusts or foreign equity funds. Most funds have an investment mandate or strategy that allows them to invest in certain industries (e.g infrastructure), geographical locations (e.g. southern Africa) or to promote certain social issues (e.g. black empowerment). These investors are primarily interested in the prospect of earning dividends or appreciation on their investment, and in achieving their social objectives.

Loan financing or debt financing: Refers to the project financing fund, which is derived in the form of concession/soft loan suppliers/export credit and commercial credit.

b) Cost of Capital

The objective of using project financing to raise capital is to create a structure that is bankable (of interest to investors) and to limit the stakeholders' risk by diverting some risks to parties that can better manage them. In project financing, an independent legal vehicle is created to raise the funds required for the project. Payment of principal, interest, dividends and

operating expenses is derived from the project's revenues and assets. The investors, in both debt and equity, require certain basic legal, regulatory and economic conditions throughout the life of the project.

The project's revenues are obtained from the government and/or fees (tariffs) charged to the users of the service. In some projects, the private sector provider also pays concession fees to the government or to another designated authority, in return for the use of the government's assets and/or the rights to provide the service, which is often a monopoly. In toll roads and ports projects, for example, the concession fee is based on the use of the service or the net income, giving the government a vested interest in the success of the project. In this case, the government's interests are comparable to those of an equity investor.

c) Project Financing Institutions

The other important concern in project financing is knowing which type of institution are responsible for financing projects and under what circumstance. Here under, an attempt is made to list some of the major the financing institution with their brief account.

i) Government: May not necessarily directly finance a project, but it often provides indirect financing through guarantees, take-or-pay contracts, sole provider licenses and other commitments. In each case, it should fully understand and be in a position to undertake such risk. The government's objective is to provide affordable and best value-for-money services to the end-user.

ii) Banks: Banks are involved at least as short-term lenders and frequently as long-term lenders and financial arrangers. On large projects, several banks may form a consortium to raise funds together. The equity investors usually select one or more lead banks to manage the consortium or the process of raising funds. This selection is based on the

banks' experience and capacity for raising funds in a certain industry and country. The banks' level of commitment in raising funds may be either a "firm commitment" or "best efforts". Stakeholders prefer a firm commitment, in which the bank will be required to furnish the funds even when it has failed to raise other funds. The fees (underwriting) paid to the bank for providing a firm commitment are therefore more expensive than for a best efforts arrangement.

Although the bank usually raises debt, it may also raise equity. The fees for raising equity are generally higher than for raising debt. The project may also hire a financial adviser to formulate a financing strategy.

iii) **Non-bank financial institutions**: Include pension, insurance and trade union funds, with a primary function of investing their assets in medium or long-term securities. Although these institutions often have significant resources, they are generally quite limited, by law and/or mandate, in their investment options. As a result, these funds usually invest in the more senior securities to ensure that they obtain the cash flow required for meeting their payout obligations to their clients.

iv) **Suppliers:** May also provide funding in the form of short to medium term debt or extended terms on accounts payable. A supplier may also be a sponsor and take an equity interest in a project. As with construction and management companies, the suppliers' primary interest in the project is usually the supply contract with the project company. Project companies may also enter into other risk reducing agreements with suppliers, such as a long-term fixed price and quantity agreement. Investors will closely scrutinize the supplier's credit rating when an agreement involves the future delivery of services.

d) Five Basic Steps of Finance Projects:

It takes a lot more than a good idea to develop a successful manufacturing venture. You need to know where to find the resources, both financial and technological, and you need to find the right people with the right skills to do the job. Knowing where

to look for these resources can save you precious time and money, and earn you some valuable partners in the process. Basically there are five steps up on which financing any project relies on:

Step 1: Identify the project

It is not too difficult to find good projects in need of investment or other assistance. This step heavily depends in the identification and selection of a project for implementation from among the different alternative available development projects.

Step 2: Determine the Feasibility of the Project

When a promising project has been identified, your next and most important step is to determine the feasibility of launching the venture. This step involves drafting a carefully detailed plan of action which reflects the venture partners' understanding of: the markets in which your products will be sold, including industry trends, tariffs and other barriers to entry; domestic and international competition in your chosen industry; the costs of human resources, technology, and other components of your venture; the expected revenue that the project can generate, as well as sources of capital. You should also take into account repayment strategies for any borrowed funds; your competitive advantage: above all, this study must also support your belief that there is room in the market for your product and that you will be able to deliver a quality product at a competitive price.

Step 3: Identify Sources of Technology

Your next step is to acquire the necessary equipment for the venture and people with the right skills to manage the project and manufacture your product. Once you have a rough idea of what technical skills and technology will be needed for your venture, the next task is to determine how to acquire these inputs. Equipment and machinery can be leased in some cases, but you may be required to purchase them because they are intended for overseas use. Industry associations are often good

sources of information on suppliers of both new and used equipment.

Step 4: Identify sources of Project Finance

There is no substitute to having some capital of your own, but few people can afford to put up the full cost of a manufacturing venture. In many cases finance is available to offset some of the initial investment costs of establishing the operation.

Step 5: Mitigate the Project Risk

Despite the best intentions and thorough planning, unforeseen events can occur that will disrupt your project. These could be sovereign risks such as unanticipated instability in the government of your host country, devaluation of the local currency, or from labor unrest.

Reading Assignment:

- **Public Policy and Regulations on Finance**