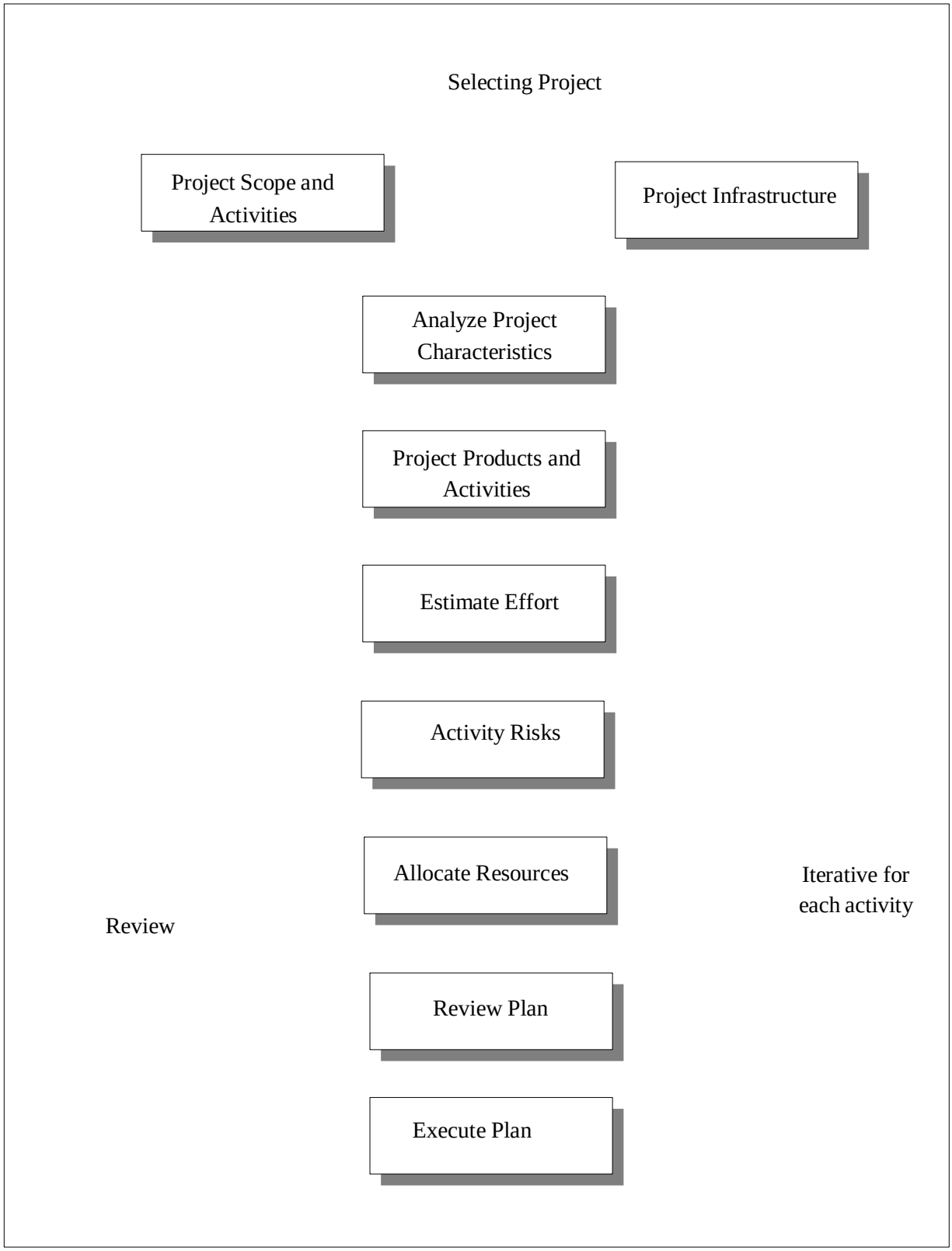
STEPWISE PROJECT PLANNING

Outline of Step Wise Project Planning

The framework of basic steps in project planning illustrates the various activities involved in the development process.

An outline of Step Wise planning is listed below:

- Selecting project
- Project scope & objectives
- Project infrastructure
- Analyze project characteristics
- Project products and activities
- Estimation effort
- Activity risks
- Allocate resources
- Review plan
- Execute plan


Selecting Project
Project Scope and Activities
Project Infrastructure
Analyze Project Characteristics
Project Products and Activities
Estimate Effort
Activity Risks
Allocate Resources
Iterative for each activity
Review
Review Plan
Execute Plan

Step 0: Selecting Project

- This is the initial step which starts well outside the project planning process.
- Feasibility study of the project helps in choosing the appropriate one.
- Strategic planning process helps in evaluating the metrics of selecting the project.
- Different methodologies are inevitable, stemming directly from the questions of what constitutes a methodology and what are a methodology's underlying principles.
- Projects differ according to size, composition, priorities, and criticality.
- The people on a project have different biases based on their experiences, principles, and fears.
- These issues combine so that, what is optimal differs across projects.
- Projects are undertaken to produce a product or a service for various reasons.
- This includes factors like market share, financial benefits, return on investment, customer retention and loyalty, and public perceptions.
- Organizations might receive several projects at a time. They have to select the best among the received projects request.
- They make decisions based on the best information they have about a particular project at a given point of time when selecting the project.

Step 1: Project Scope and Objectives

- Every stakeholder involved in the project must agree on the objectives defined in determining the success of the project.
- Scope statements may take many forms depending on the type of project being implemented and the nature of the organization.
- The scope statement details the project deliverables and describes the major objectives.
- The objectives should include measurable success criteria for the project.
- The Scope Statement should be written before the Statement of work and it should capture, in very broad terms, the product of the project, for example, *"developing a software based system to capture and track orders for software."*

- The Scope Statement should also include the list of users using the product, as well as the features in the resulting product.
- As a baseline scope statements should contain:
  - The project name
  - The project charter
  - The project owner, sponsors, and stakeholders
  - The problem statement
  - The project goals and objectives
  - The project requirements
  - The project deliverables
  - The project non-goals
  - Milestones
  - Cost estimates
- In more project oriented organizations the scope statement may also contain these and other sections:
  - Project Scope Management Plan
  - Approved change requests
  - Project assumptions and risks
  - Project acceptance criteria
- The project objectives are identified and practical measures are analyzed in achieving them
- A project authority must be identified to have an overall authority over theproject.
- Identify different stakeholders involved in the development of the project.
- Changes in the objectives must be in a controlled manner.
- Interaction and communication among all parties must be straight forward.

Step 2: Project Infrastructure

- Project Infrastructure refers to the organizational structure, processes, tools, techniques and training an organisation puts in place to make projects more successful.

- Organisational Structure – Organisational structure including such support mechanisms as project management office, project recruiting function, financial
- monitoring area etc. It also covers lines of communication and escalation.
- Processes – Typically methodologies, checklists and guidelines
- Tools – Software and templates
- Techniques – Repeatable processes such as kick off meetings, PIRs, analysis techniques, etc.
- Training – Formal and informal training and reference documentation
- Organization must give priorities for multiple projects to be carried out.
- Strategic decisions must be documented within the strategic plan in identifying the relationship between multiple projects.
- Change control must be implemented without affecting the original objectives.
- Configuration and procedural standards are defined for quality checks at regular intervals of the SDLC process and documented in separate manual.
- Measurement programme determines the control policy and monitors the progress of the project.
- Project manager must have an overall control of any project planning and control standards adopted.
- Project leader takes the responsibility of building the project team as an organized, well-built and effective one yielding excellent results.
- Team members must work together as a team and resolve conflicts.

Step 3: Analyze Project Characteristics

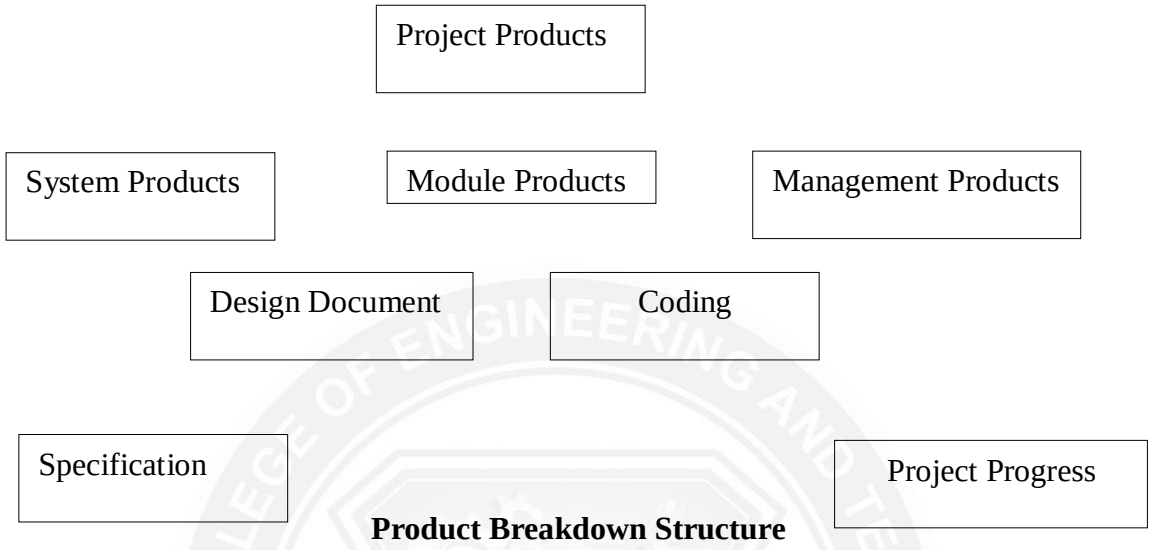
- The project is categorized as either product-driven or an objective-driven.
- A project has several characteristics:
  * Projects are unique.
  * Projects are temporary in nature and have a definite beginning and ending date.
  * Projects are completed when the project goals are achieved or it's determined the project is no longer viable.

* A successful project is one that meets or exceeds the expectations of your stakeholders.

- As the system is developed, the product is driven out of the defined objectives.
- The project must be analyzed based on its quality requirements.
- Projects are prone to higher risk which needs to be handled without affecting the product created.
- In implementing the product, user requirements are given due importance.
- Appropriate methodology and SDLC process must be chosen to suit the current product.
- Review the overall resource estimates.

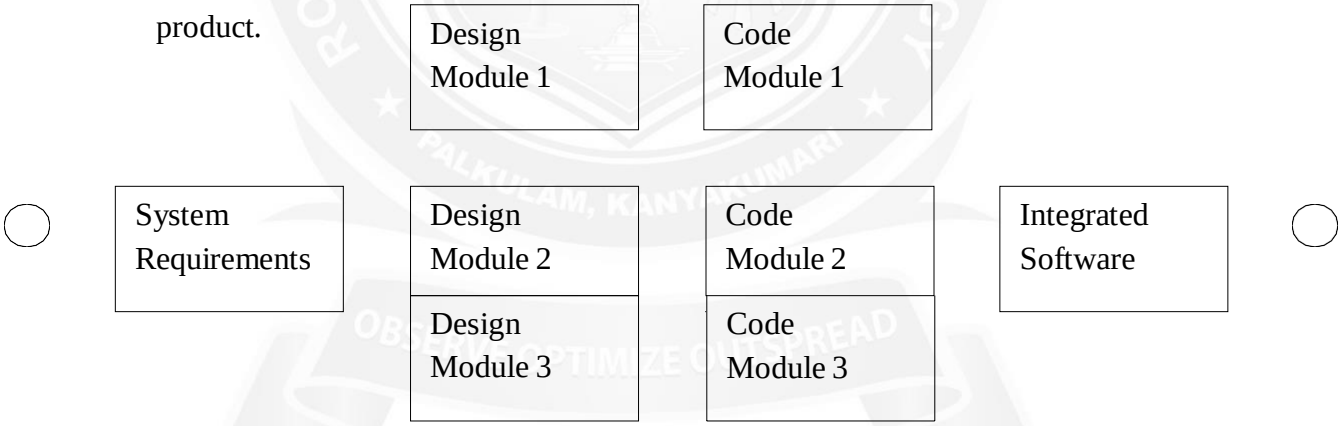
Step 4: Project Products and Activities

- Identify the project deliverables i.e. the end product that has to been given over to the client.
- Some products are identified as intermediate products during the creation of deliverables.
- Project products can be System products, module products or management products.
- Technical products include training materials and operating instructions in managing the quality of the project.
- Describe the project products into components and sub-components related to individual modules in each step.
- Every activity must be carried out for each stage of the development process.
- Management products include progress of the project that is developed.
- Product descriptions contain the identity, purpose, derivation, composition, form, relevant standard and the quality criteria that apply.
- Not all products are independent. Some products depend on other products for their creation.



Product Breakdown Structure

- Product flow diagram represents the flow of the product being developed.
- Product instances must be recognized when a product is related to more than one product.



Sample Activity Network

- An activity network is created for generating the product that depends on another product describing every task associated with it.
- Sequencing of activities minimizes the overall duration for the project.
- For a complex project, the entire project can be divided into stages and checkpoints can be formulated at each specific stage for compatibility.
- Milestones represents the completion of important stages of the project.

Step 5: Estimating Effort

- The effort estimation for the staff required, the probable duration and the non-staff resources needed for every activity is determined.
- These estimates depend on the type of the activity.
- Effort is the amount of work that has to be done.
- Software development efforts estimation is the process of predicting the most realistic use of effort required to develop or maintain software based on incomplete, uncertain and/or noisy input.
- Effort estimates may be used as input to project plans, iteration plans, budgets, investment analyses, pricing processes and bidding rounds.
- Elapsed time is the time between the start and end of a task.
- With all the activities defined, the overall duration of the project can be calculated using the activity network.
- For longer activities it will be difficult to control the project over estimating factors.
- There are many ways of categorizing estimation approaches. The top level categories are the following:
    - Expert estimation: The quantification step, i.e., the step where the estimateis produced based on judgmental processes.
    - Formal estimation model: The quantification step is based on mechanicalprocesses, e.g., the use of a formula derived from historical data.
    - Combination-based estimation: The quantification step is based on a judgmental or mechanical combination of estimates from different sources.
- The uncertainty of an effort estimate can be described through a prediction interval (PI). An effort PI is based on a stated certainty level and contains a minimum and a maximum effort value.
- The most common measures of the average estimation accuracy is the MMRE (Mean Magnitude of Relative Error), where MRE is defined as:

  MRE = |actual effort − estimated effort| / |actual effort|

- Psychological factors potentially explaining the strong tendency towards over-optimisticeffort estimates that need to be dealt with to increase accuracy of effort estimates.
- These factors are essential even when using formal estimation models, because much ofthe input to these models is judgment-based.
- Factors that have been demonstrated to be important are: Wishful thinking, anchoring,planning fallacy and cognitive dissonance.
- The psychological factors found in work by Jorgensen and Grimstad describes,
  - It's easy to estimate what you know.
  - It's hard to estimate what you know you don't know.
  - It's very hard to estimate things that you don't know you don't know.

Step 6: Identify Activity Risks

- Activity based risks are identified for every activity based on number of assumptions.
- Risk planning reduces the impact of identified risks.
- To materialize the risk, contingency plans are specified.
- New activities can reduce risks to a certain extent when there is change in plans.
- Risks fall into three broad categories — controllable known, uncontrollable known and unknown.
- The former two, are those risks happen before they can determine how to manage them. This is done using root cause analysis.
- As the name implies its goal is to look for the root cause on the problem and solve it at that point.
- The four ways of handling risk are:
  - **Avoidance** - Take action to avoid the risk
  - **Mitigation** - Define actions to take when the risk occurs
  - **Transfer** - Have someone else handle the risk i.e. insurance
  - **Acceptance** - Identify the risk as acceptable and let it happen.

- Determining which option to chose is primarily financial, but schedule and manpower may be involved.
- As a tool, a number of "checklist" opinions for looking at each of these options.
- Contingency planning is briefly discussed for scope, resource and schedule.

Step 7: Allocate Resources

- Resource allocation is used to assign the available resources in an economic way. It is part of resource management. In project management, resource allocation is the scheduling of activities and the resources required by those activities while taking into consideration both the resource availability and the project time.
- Staff needed and available are identified for each activity and allocated their respective tasks.

Tasks / Months	JAN	FEB	MAR	APR	MAY
System requirements					
Devise Integration test cases					
Design module 1					
Code module 1					
Design module 2					
Code module 2					
Integrated software					

Gantt chart showing staff tasks

- Staff priority list is generated based on the task allotted to them because some staffs are used for more than one task.

- A Gantt chart pictorially represents when activities have to take place and which one has to be executed at the same time.
- The chart represents when staff will be carrying out the tasks in each month. It also shows staff involved in more than one task.
- When allocating resources the constraints associated is estimated and included in the overall cost.

Step 8: Review Plan

- When a task is completed it leads to the quality review. These quality checks have to be passed before the activity is completely signed-off.
- Every plan has to be documented and all stakeholders must have agreed to all constraints and understand the project.
- There are some steps involved in project plan review.
  - **Define the problem:** This activity provides the background for decisions about the scope and focus of the Project Review. Here are some simple questions the Project Review Team can ask themselves before creating a plan for the project. Use our Planning Tool to capture the background on your project.
    - What, if any, review work has already been done?
    - What is the problem we are trying to solve?
    - What would success look like?
    - Scope the Project. How big was it? How long did it take? How many people were involved?
    - What is the investment the team would like to make?
  - **Determine the focus**: The focus of the Project Review is the question that the team will ask themselves as they investigate the events that occurred during the project. This is the fundamental question that will guide the decisions that the team will make while planning the Project Review. It is always stated as aquestion. A commonly used question that project teams ask is:
    - What are the root causes of events that determined or impacted resources, schedule, or quality?

- **Select the appropriate tools**: Now that the scope, the goal and the problem are known, the data set needed for the project review are identified along with the various activities that will used.
- **Identify the participants**: The Project Review Leadership Team guides the Postmortem effort. As a group they determine the focus if the investigation, select the tools that will be used, review the output from each step, decide who should participate in each activity, and are responsible for reporting lessons learned and recommendations for action. The Project Review Team usually consists of the movers and shakers that drove the project or event. They work together to manage
- The Project Review process. The team should consist of folks most intimate with the project including any of the following representatives:
  - ❖ Project Managers
  - ❖ Product Managers
  - ❖ Development Leads
  - ❖ Quality Leads
  - ❖ Content Experts
  - ❖ Customer Support Leads
  - ❖ Management
- **Document the review plan**: The project review template can be used so that everyone responsible for implementation has a copy of the plan.

Step 9: Execute Plan

- ➢ Finally, the execution of the project is drawn with each specified activity as it is approached.
- ➢ Detailed planning of later stages is necessary because more information will be available than the start stage.
- ➢ Project planning and execution becomes an iterative process where as each activity which is to be carried out approaches, they should be reviewed in detail.