

UNIT 2: PROJECT ORGANIZATION, SCHEDULING AND MANAGEMENT ISSUES

Includes...

1. Project Life Cycle
2. Product Life Cycle
3. Project Planning
4. Project Scheduling
5. Resource Allocation

What is a Project??

- A project is a unique endeavor to produce a set of deliverables within clearly specified constraints of time, cost and quality.
- Projects are different from business operations, in terms of uniqueness, timescale, budget, resources, risk and change.
 - **Uniqueness:** Every project is different from the last, whereas operational activities typically involve repetitive (if not identical) processes.
 - **Timescale:** A project has clearly specified start and end dates within which deliverables are produced to meet the customer's requirements.
 - **Budget:** A project has a maximum limit to the expenditure within the deliverables must be produced, to meet the customer's requirement.
 - **Resources:** A project is allocated a specified amount of labor, equipment and materials at the start.
 - **Risk:** A project entails uncertainty and therefore carries business risk.
 - **Change:** The purpose of a project is typically to improve an organization through the implementation of business change.

What is Project Management??

- Project Management is the *utilization of skills, tools and management processes* to undertake a project successfully.
- A project management methodology includes:
 - *A Set of Skills*: Specialized knowledge, skills and experience help *reduce a project's level of risk* and thereby *increase its likelihood of success*.
 - *A Suite of Tools*: Project Managers use various types of tools to improve a project's success rate.
 - *Examples include; templates, forms, registers, software and checklists*
 - *A Series of Processes*: A suite of management processes are needed to monitor and control the project, such as *time management, cost management, quality management, change management, risk management and issue management*.

Project Management success factors

The capacity to marshal resources, lay out plans, program work and spur effort for a temporary endeavor which is finite in that it has a defined beginning and ending, and which is undertaken to create a unique product or service.

- On time delivery ----- **TIME ?????**
- Within budget delivery ----- **ECONOMY ?????**
- High quality delivery ----- **QUALITY ?????**

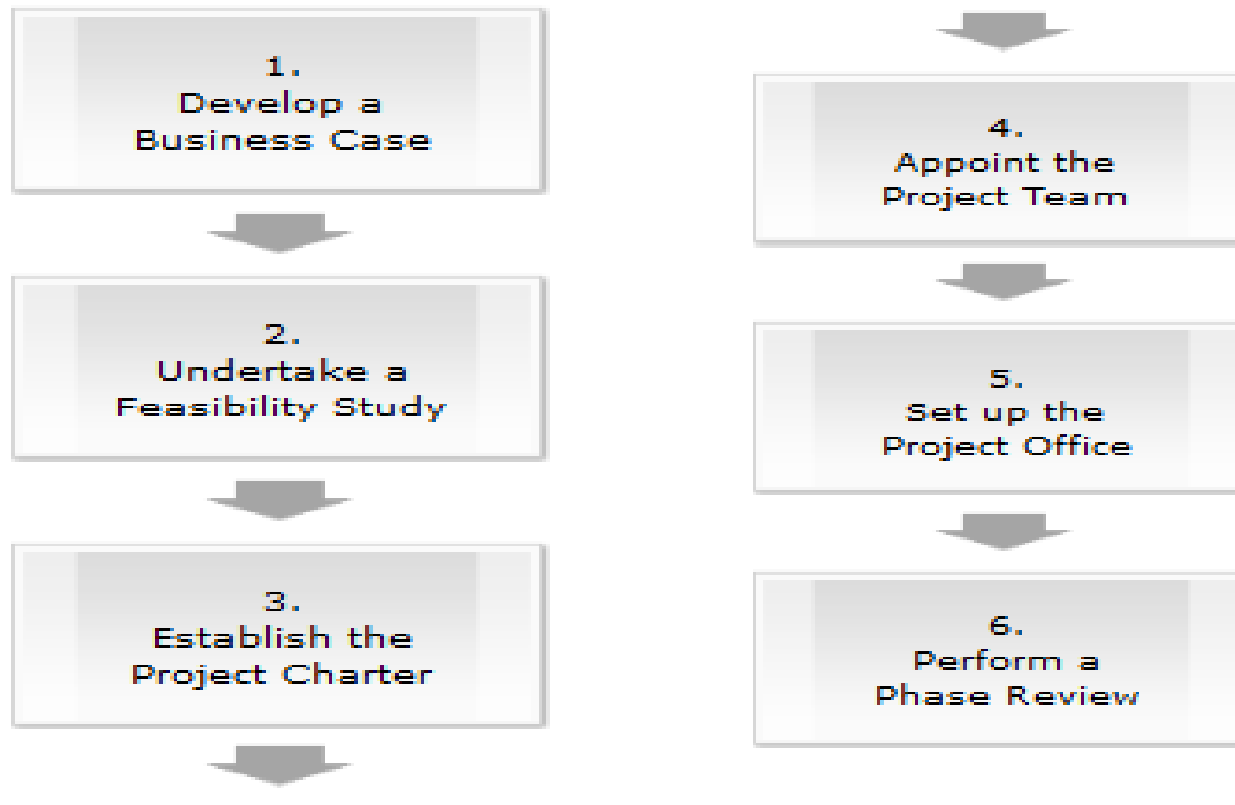
Define: Project Life Cycle



Project Life Cycle : **Project Initiation Phase**

- The **Project Initiation Phase** is the 1st phase in the *Project Life Cycle*, as it involves starting up a new project.
- One can **start a new project by defining its objectives, scope, purpose and deliverables** to be produced.
- One will also **hire project team, setup the Project Office** and **review the project**, to gain approval to begin the next phase.

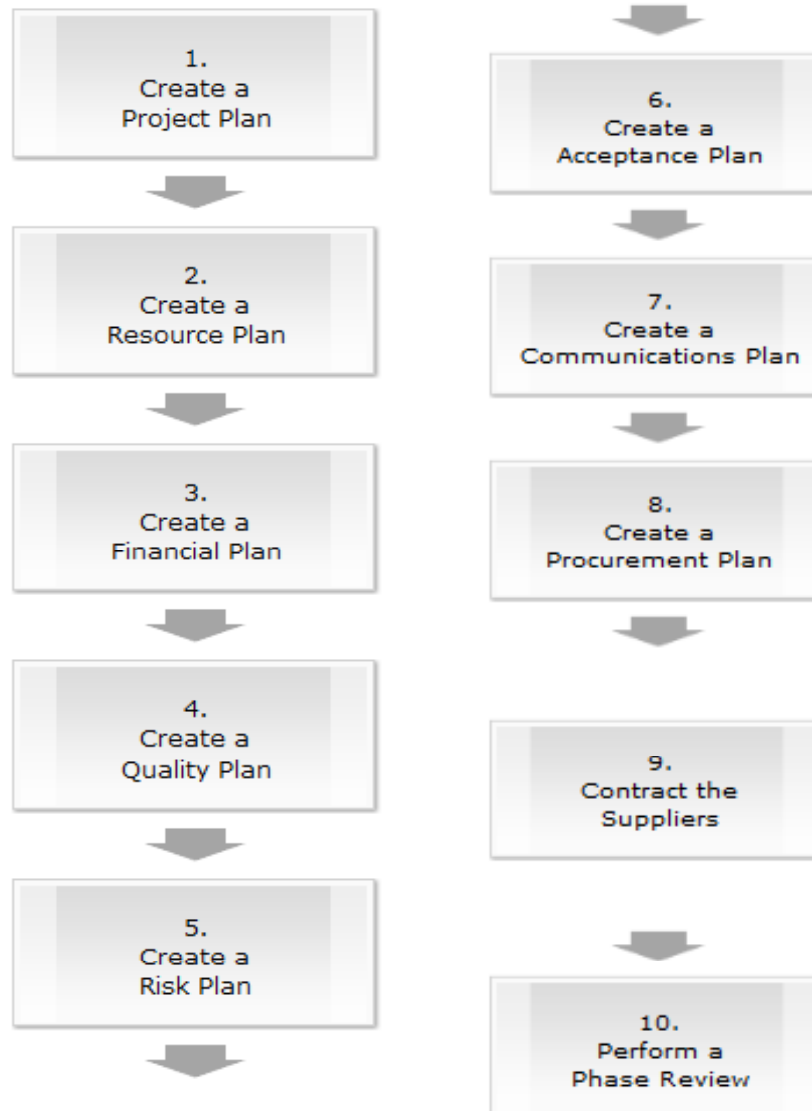
Project Life Cycle : **Project Initiation Phase**



Project Life Cycle :**Project Planning Phase**

- The **Project Planning Phase** is the second phase in the *project life cycle*.
- It involves creating of a set of plans to help guide the team through the execution and closure phases of the project.
- The plans created during this phase **will help to manage time, cost, quality, change, risk** and issues. They will also help **manage staff and external suppliers**, to ensure that you deliver the project on time and within budget.

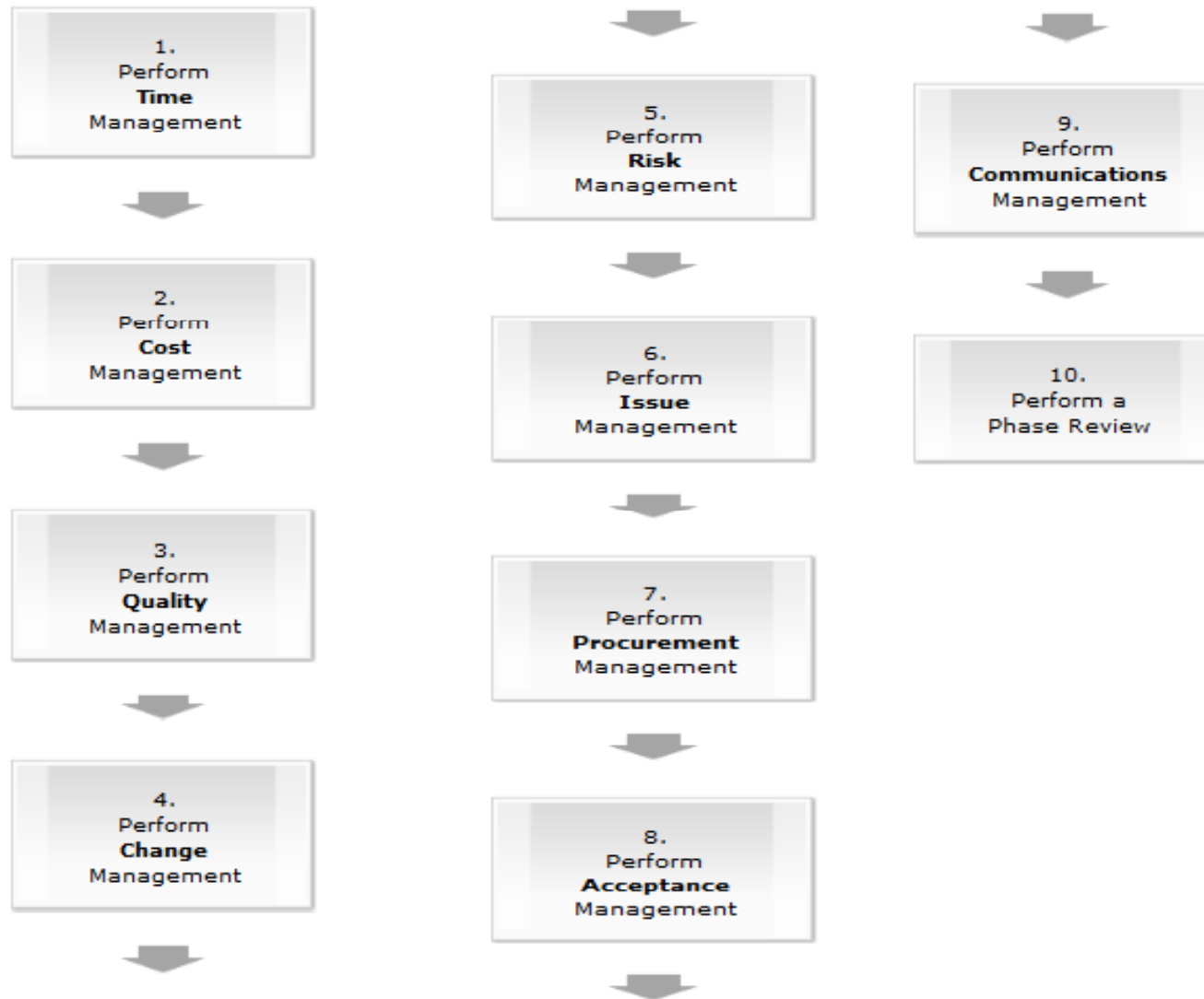
Project Life Cycle: **Project Planning Phase**



Project Life Cycle : **Project Execution Phase**

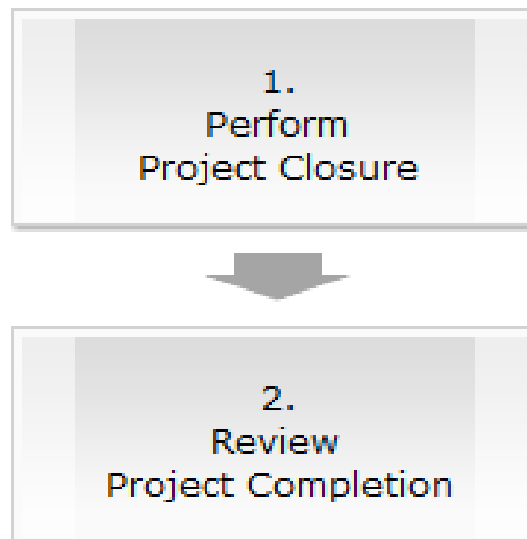
- The **Project Execution Phase** is the third phase in the *project life cycle*.
- One will **build the physical project deliverables** and **present them to the customer** for signoff.
- This is usually the **longest phase** in the project life cycle and it typically **consumes the most energy and the most resources**.

Project Life Cycle : **Project Execution Phase**

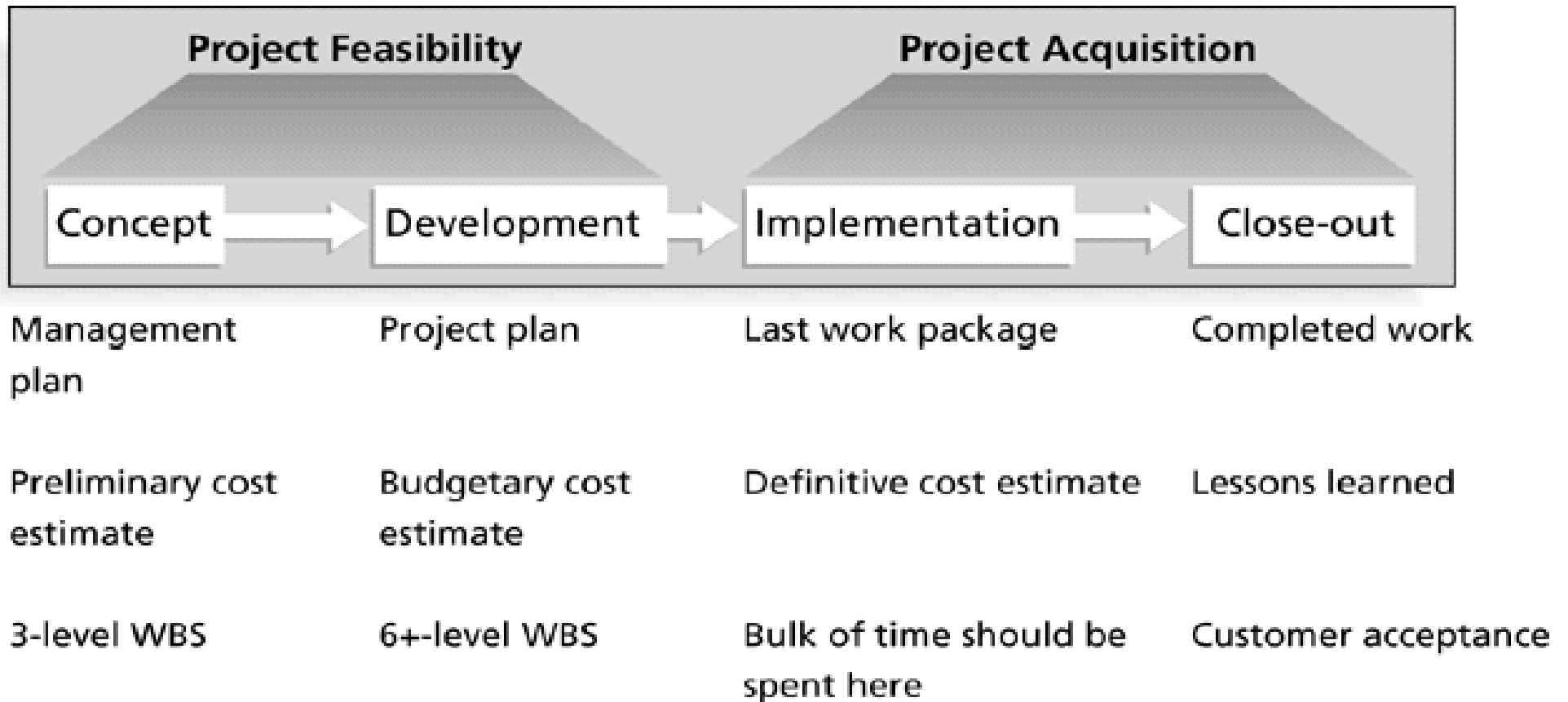


Project Life Cycle : **Project Closure Phase**

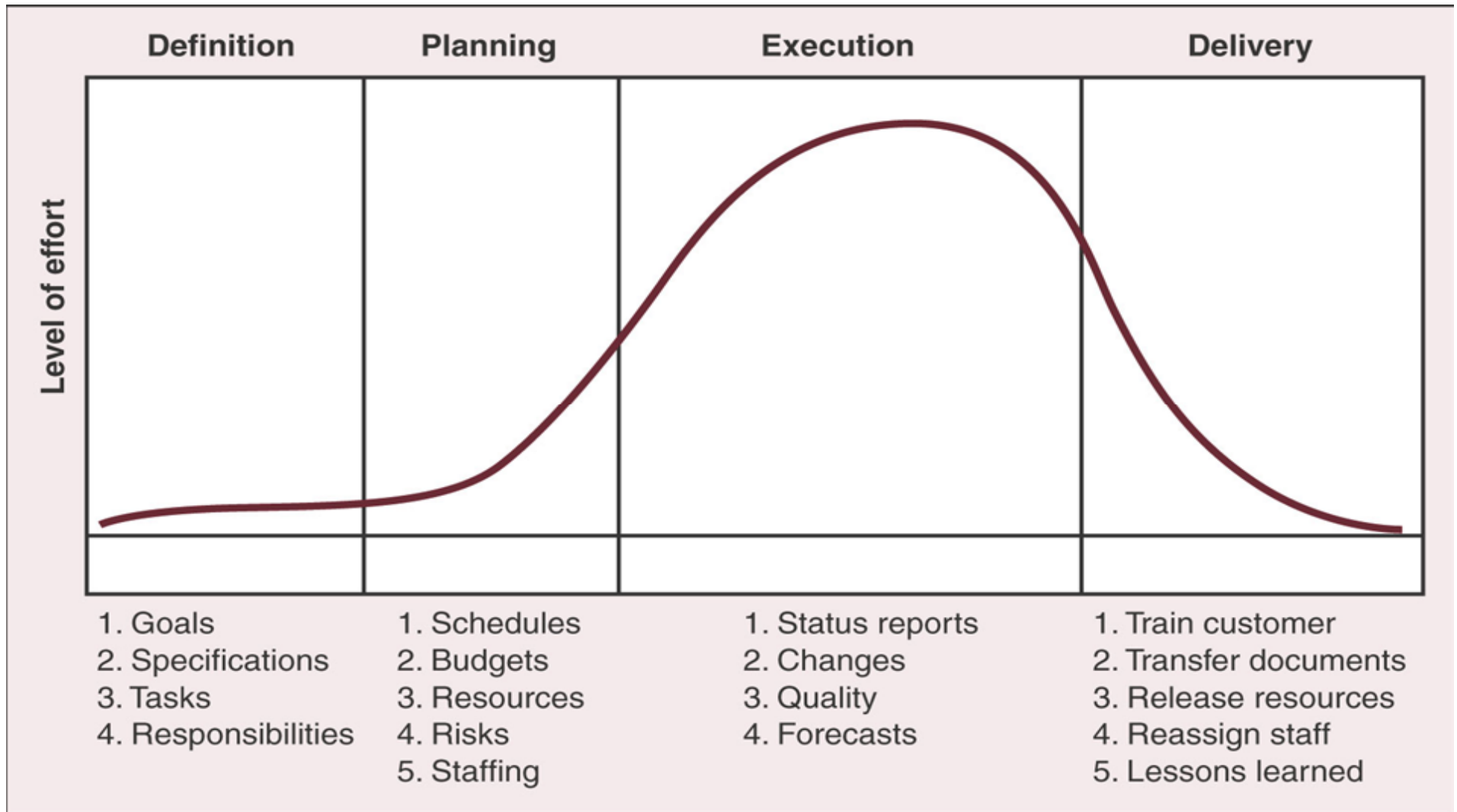
- The **Project Closure Phase** is the fourth and last phase in the *project life cycle*.
- In this phase, one will **formally close the project** and then **report its overall level of success** to the sponsor.
- Project Closure involves **handing over the deliverables to the customer, passing the documentation to the business, cancelling supplier contracts, releasing staff and equipment, and informing stakeholders of the closure of the project.**



Project Life Cycle : **An Overview**



Project Life Cycle : **An Overview**



Project Life Cycle Phases

Er. Rajan Karmacharya

Define

Plan

Implement

Close

Key Purpose

Propose a project to senior management with a brief written document to establish a shared understanding of the proposal before writing a Plan, Schedule, and Budget

Propose a project in more detail, and outline a clear approach for executing the project in a Plan, Schedule, and Budget

Do the work described in the Project Plan, aligned with the Schedule and Budget

Shut down the project in a controlled manner

Key Questions

- Is this the right project?
- What results should it achieve?
- How will success be measured?

- How will the project achieve its objectives?
- When will the project finish?
- Who will do what?
- What will it cost?
- How will risks/issues be managed?

- How is project work progressing?
- What issues and risks does the project face, and how should these be managed?
- How much is the project actually costing?

- Is the work of the project complete?
- Did the project achieve its results/outcomes?
- What did the team learn that could help other projects?
- Where do project staff go next?

Key Activities

- Understand stakeholder interests and expectations
- Establish a shared high-level understanding of the proposed project and its intended results

- Thoroughly plan the project activities, schedule, and resource requirements
- Provide more detailed information to senior management for discussion and approval

- Mobilize the team to execute the Project Plan
- Control the execution of the Project Plan
- Communicate with stakeholders
- Report project status
- Update the Project Plan, Schedule, Budget, and Business Case as needed

- Demonstrate that the project is complete
- Assess the success of the project
- Undertake administrative close-out
- Transfer knowledge to the permanent organization
- Support departing staff

Key Deliverables

- Project Definition Document and/or Business Case

- Project Plan
- Project Schedule
- Project Budget

- Project Manual
- Status Reports
- Risk, Issue, and Change Logs
- Updated Plans, Schedules, Budgets

- Final Acceptance Document
- Lessons Learned Document
- Project Archives

Moving to the Next Phase

When your Project Definition Document and/or Business Case are approved by senior management, move to the Plan Phase

When your Project Plan, Schedule, and Budget are approved by senior management, move to the Implement Phase

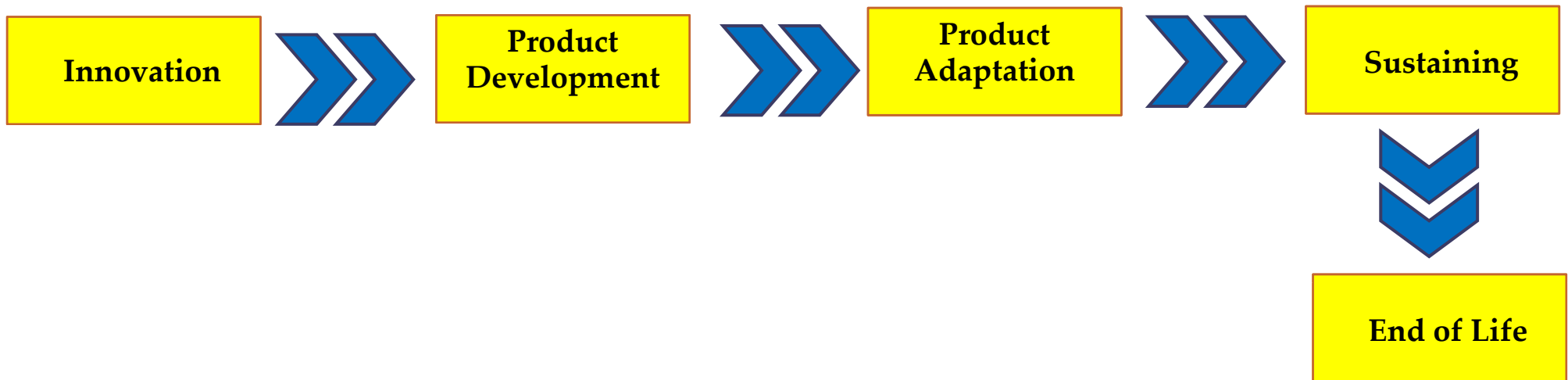
As project deliverables near completion, move to the Close Phase

When this phase is complete, the project is finished

Product Life Cycle

- The product life cycle *starts with the idea of a new product* in an organization that gets evaluated during the innovation phase which is followed by the product development phase.
- After the initial market introduction the product is adapted and then sustained and finally reaches its end of life.

- *Phases of product life cycle*



Product Life Cycle

Review Milestone	Milestone Questions
End Of Innovation	Does a product idea exist that is ready for production? Is the available product idea good for the company and its target market?
End of Product Development	Is the implementation done correctly? Is the product functionality meeting customer needs? Is the software product ready for delivery? Is marketing ready to launch the product?
End of product Adaptation	Do existing product modifications meet customer demands?
End of Sustaining	How big is the existing customer base that is actively using this product? Is this customer base ready to transfer to a new product? Can resources supporting this product be shifted to other product developments?
End of life	Have all customers been transferred to the new product? Has the infrastructure, the product and its documentation been archived?

Stepwise Project Planning Process

- Step 0: Select project
- Step 1: Identify project scope and objectives
- Step 2: Identify project infrastructure
- Step 3: Analyze project characteristics
- Step 4: Identify project products and activities
- Step 5: Estimate effort for each activity
- Step 6: Identify activity risks
- Step 7: Allocate resources
- Step 8: Review/publicize plan
- Step 9: Execute plan
- Step 10: Execute lower levels of planning

Step 1: Identify project scope and objectives

- **Step 1.1** Identify objectives and practical measures of the effectiveness in meeting those objectives
- **Step 1.2** Establish a project authority
 - **To ensure the unity of purpose among all persons concerned**
- **Step 1.3** Identify all stakeholders in the project and their interests
- **Step 1.4** Modify objectives in the light of stakeholder analysis
- **Step 1.5** Establish methods of communication between all parties

Step 2: Identify Project Infrastructure

- **Step 2.1** Identify relationship between the project and strategic planning
 - To determine the order of related projects (in the organization) being carried out
 - To establish a framework within which the system fits
 - To ensure the hardware and software standards are followed
- **Step 2.2** Identify installation standards and procedures
 - more appropriate name: “Identify standards and procedures related to the software project”
- **Step 2.3** Identify project team organization

Step 3: Analyze Project Characteristics

- **Step 3.1** Distinguish the project as either objective-driven or product-driven
- **Step 3.2** Analyze other project characteristics (including quality-based ones)
- **Step 3.3** Identify high level project risks
- **Step 3.4** Take into account user requirements concerning implementation
- **Step 3.5** Select general lifecycle approach in the light of the above
- **Step 3.6** Review overall resource estimates

Up to this stage,

- the major risks of the project are identified
- the overall approach of the project is decided

So, it is a good place to re-estimate the required effort and other resources for the project

Step 4: Identify Project Products and Activities

- **Step 4.1** Identify and describe project products
 - **Identify all the products related to the project**
 - **Account for the required activities**
- **Step 4.2** Document generic product flows
 - **To document the relative order of the products**
- **Step 4.3** Recognize product instances
- **Step 4.4** Produce an ideal activity network
 - **Activity network shows the tasks that have to be carried out as well as their sequence of execution for the creation of a product from another**
- **Step 4.5** Modify the ideal to take into account need for stages and checkpoints
 - **To check compatibility of products of previous activities**

The Product Breakdown Structure (PBS)

- The products will form a hierarchy. The main products will have sets of component products which in turn may have sub-component products and so on.
- These relationships can be documented in a Product Breakdown Structure (PBS).

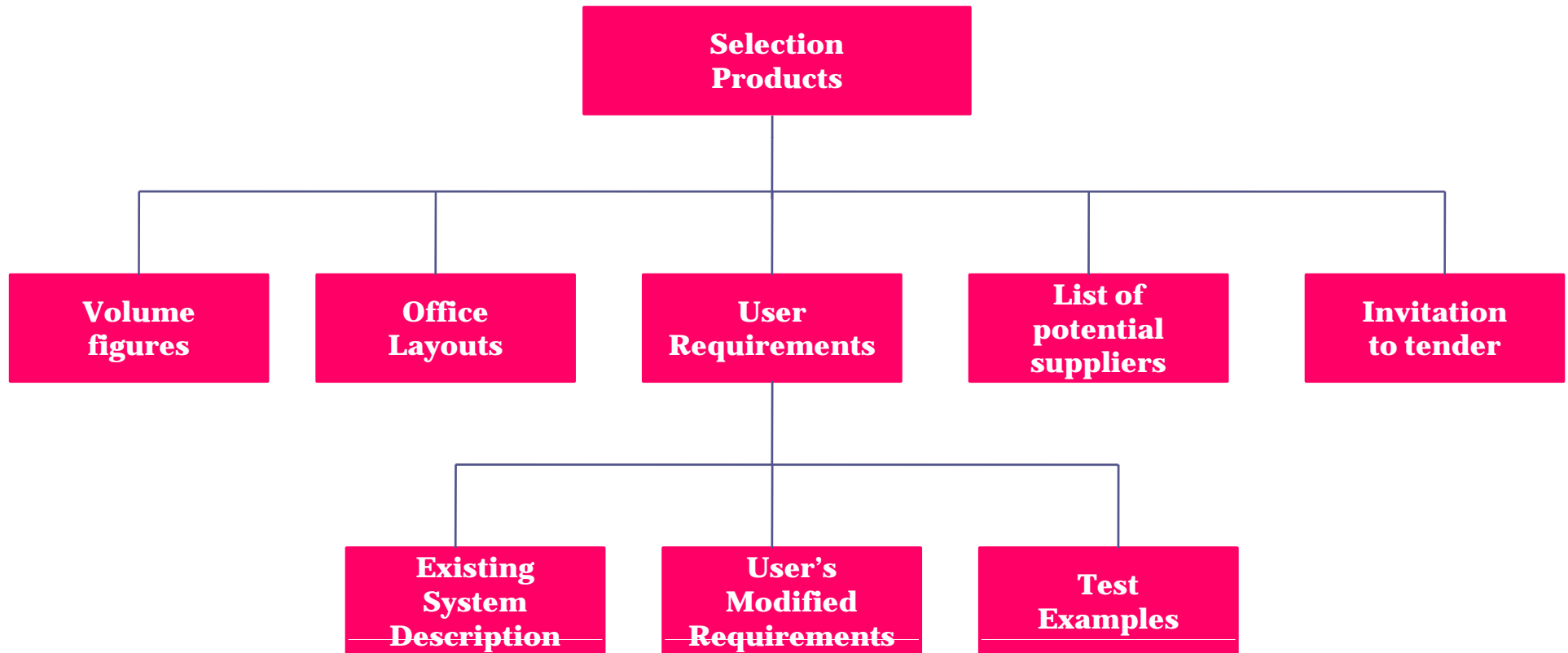


Fig X: A fragment of product break down structure for the Brightmouth college payroll project

Product Flow Diagram (PFD)

- Some products will need one or more products to exist first before they can be created .
- Eg. A program design must be created before the program can be written and the program specification must exist before the design can be commenced.
- These relationships can be portrayed in a Product Flow Diagram (PFD).

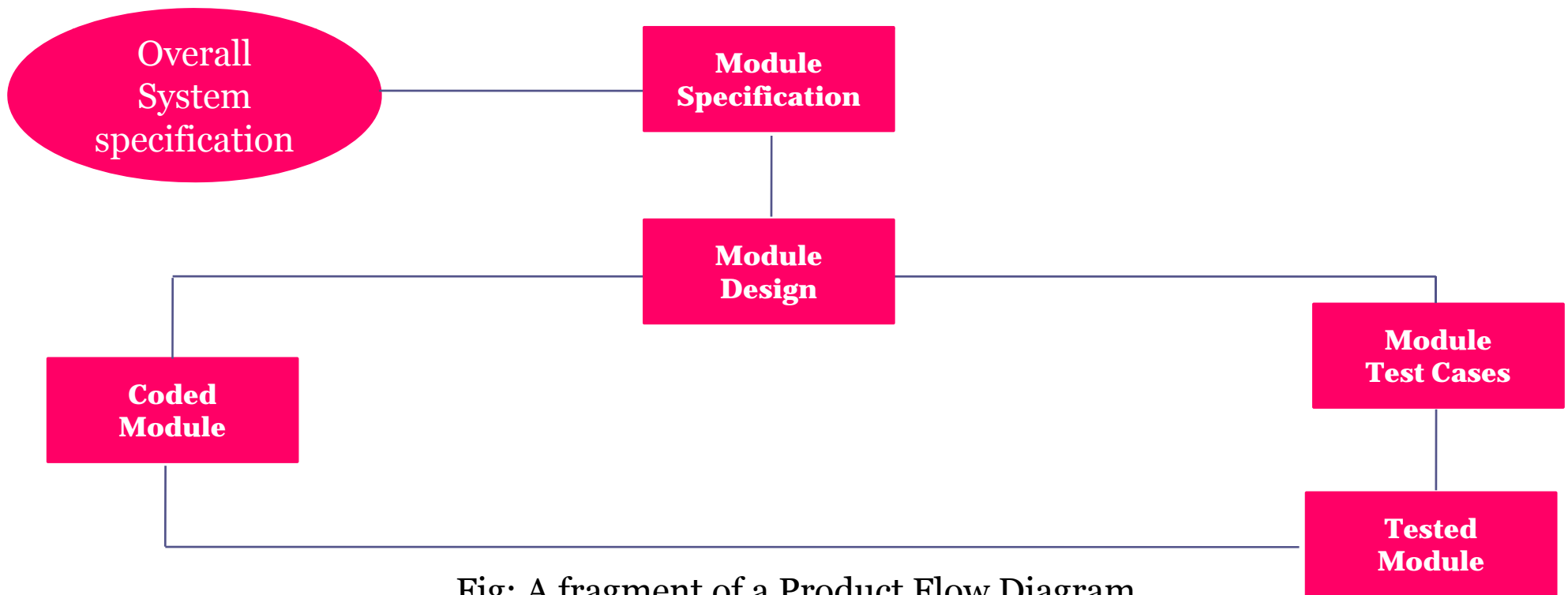


Fig: A fragment of a Product Flow Diagram

Lets Try This!!

- Draw up a possible PFD based on the PBS shown in the figure X above . This represents the products generated when gathering information to be presented to potential suppliers of the hardware. The volume figures are for such things as the number of employees for whom records will have to be maintained.

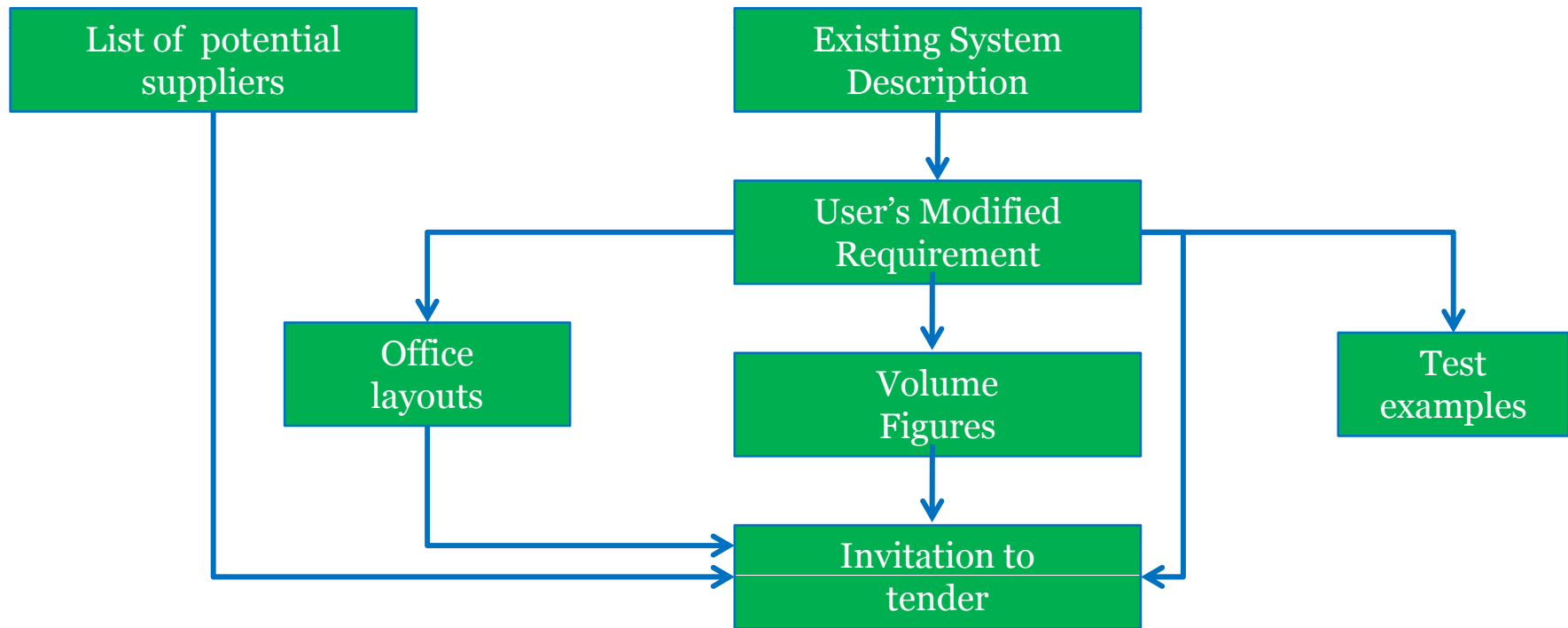


Fig: Product flow Diagram for “Invitation to Tender”

Step 5: Estimate Effort for Each Activity

- **Step 5.1** Carry out bottom-up estimates
 - **need to estimate staff effort, time for each activity, and other resources**
- **Step 5.2** Revise plan to create controllable activities
 - **need to break a task into a series of manageable sub-tasks**

Step 6: Identify Activity Risks

- **Step 6.1** Identify and quantify the risks of each activity
- **Step 6.2** Plan risk reduction and contingency measures where appropriate
- **Step 6.3** Adjust overall plans and estimates to take account of risks

Step 7: Allocate Resources (Staffing)

- **Step 7.1** Identify and allocate resources
 - **type of staff needed for each activity**
 - **staff availabilities are identified**
 - **staff are provisionally allocated to task**
- **Step 7.2** Revise plans and estimates to take into account resource constraints
 - **staffing constraints**
 - **staffing issues**

Step 8: Review/publicize Plan

- **Step 8.1** Review quality aspects of the project plan
 - To ensure each activity is completed with a quality product
 - Each activity should have 'exit requirements'.
 - This ensures the quality of the product on each activity.
- **Step 8.2** Document plans and obtain agreement
 - all parties understand and agree to the commitments in the plan

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Step 9: Execute Plan

- ***Step 9.1*** Build the physical project deliverables and present them to the customer for signoff.

Scheduling

- *“I love deadlines. I love the whooshing sound they make as they fly by.” – Douglas Adams*
- The Schedule connects the scope, work estimates and deadline into a network of software development tasks
- Must Manage:
 - **Parallelism (tasks can be undertaken simultaneously)**
 - **Dependency (task has an effect on subsequent tasks)**
- Bad Scheduling is a very destructive influence
- 90-90 Rule: First 90% of a project is complete in 90% of the scheduled time. The other 10% is also completed in 90% of the time

Why are Projects late?

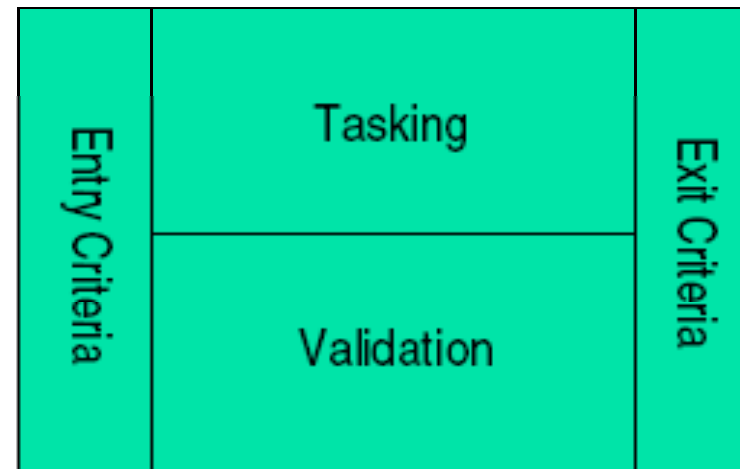
- An unrealistic deadline established by outsiders
- Changing customer requirements that are not reflected in the schedule
- An honest underestimate of effort and/or resources required
- Risks that were not considered when the project started
- Technical difficulties that could not have been foreseen
- Human difficulties that could not have been foreseen
- Miscommunication among project staff
- Project management failing to recognize schedule slippage and not taking corrective action

Dealing with Unrealistic Deadlines

“Any commander in chief who undertakes to carry out a plan which he considers defective is at fault; he must put forth his reasons, insist on the plan being changed, and finally tender his resignation rather than be the instrument of his army’s downfall.” – Napoleon

Tools and Techniques for the planner

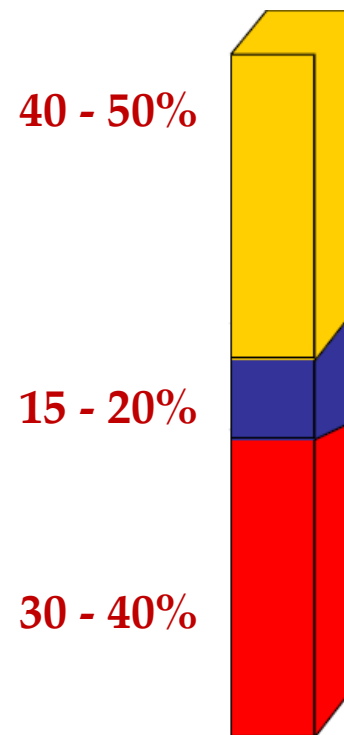
- Scheduling
 - **PERT – Program Evaluation and Review Technique**
 - **Work Breakdown Structure (WBS)**
 - **Gantt Chart – Named after Henry Grant**
- ETVX – How do you track tasks
 - **Entry Criteria**
 - Before starting
 - **Tasking**
 - **Validation**
 - **Exit Criteria**
 - After finished



Tracking the Schedule

- Use list of Critical dates
- When do you need the resources
- When can you release the resources
- Actuals vs. Estimates
 - **Do you have to re-plan**
 - **Are resources over committed**
- Mythical Man-month
 - **Wall clock time vs. project time**
 - **Trade \$ for effort**

Resource Allocation



- “front end” activities
 - **customer communication**
 - **analysis**
 - **design**
 - **review and modification**
- construction activities
 - **coding or code generation**
- testing and installation
 - **unit, integration**
 - **white-box, black box**
 - **regression**