Project Management
Unit 3: Project Budgeting and Estimation

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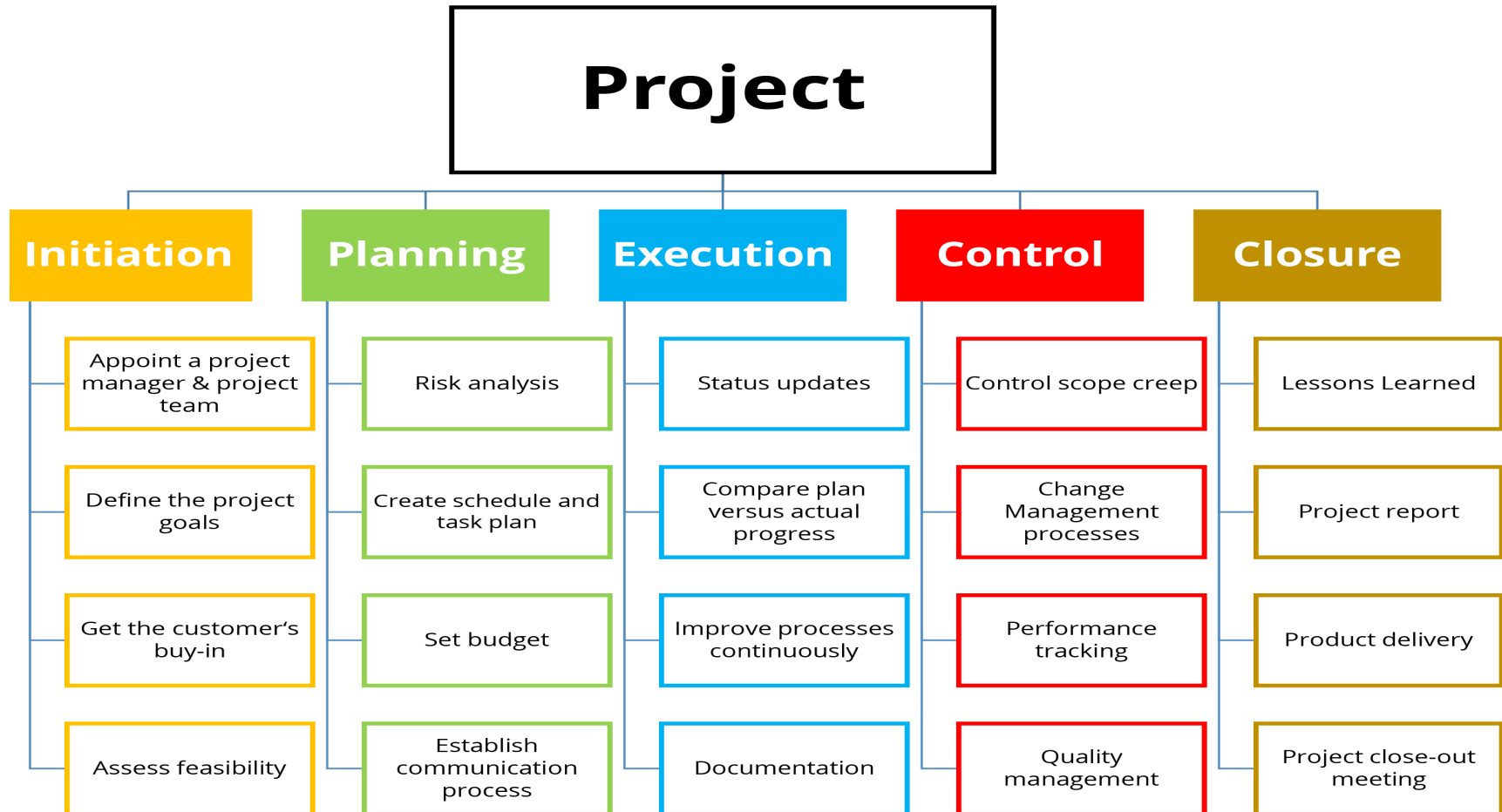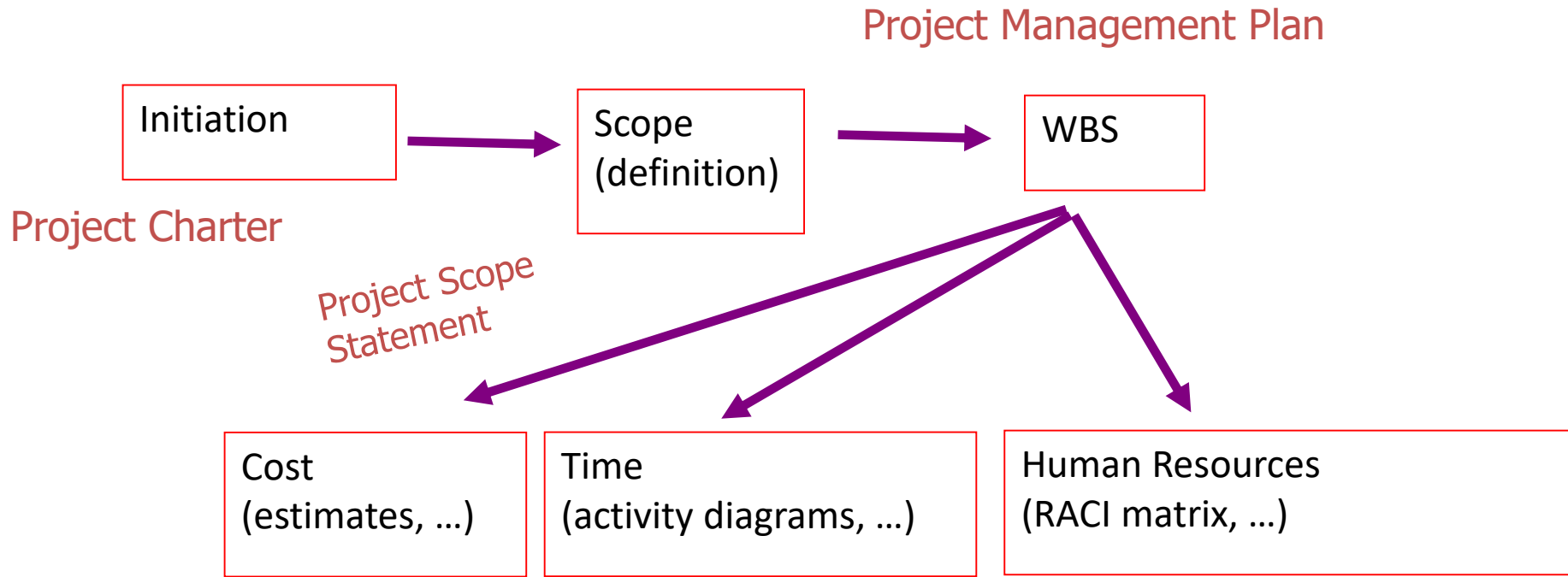# Work Breakdown Structure(WBS) & Linear Responsibility Chart

Project Management Processes (Initiation)


```
                              Project

Initiation        Planning        Execution        Control        Closure

Appoint a        Risk analysis    Status updates   Control scope   Lessons Learned
project                                            creep
manager &
project team

Define the       Create schedule  Compare plan     Change          Project report
project goals    and task plan    versus actual    Management
                                  progress         processes

Get the          Set budget       Improve          Performance     Product delivery
customer's                        processes        tracking
buy-in                            continuously

Assess           Establish        Documentation    Quality         Project close-out
feasibility      communication                     management      meeting
                 process
```

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Project Management Processes (Initiation)

Project Management Plan

Initiation	→	Scope (definition)	→	WBS

Project Charter

Project Scope Statement

Cost (estimates, …)	Time (activity diagrams, …)	Human Resources (RACI matrix, …)

- Also to consider: Quality, Risk, Communication, Procurement, Integration (PMBOK® knowledge areas)

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Work Breakdown Structure (WBS)

- It is a hierarchical decomposition of the **work** to be executed by the **project** team to accomplish the **project** objectives and create the required deliverables.

- It organizes and defines the total scope of the **project**.

- The WBS is a representation of the detailed project scope statement that specifies the work to be accomplished by the project.

- The elements comprising the WBS assist the stakeholders in viewing the end product of the project.

- The work at the lowest-level WBS component is estimated, scheduled, and tracked.

- The goal of **WBS** in **project management** is to make a large **project** manageable.

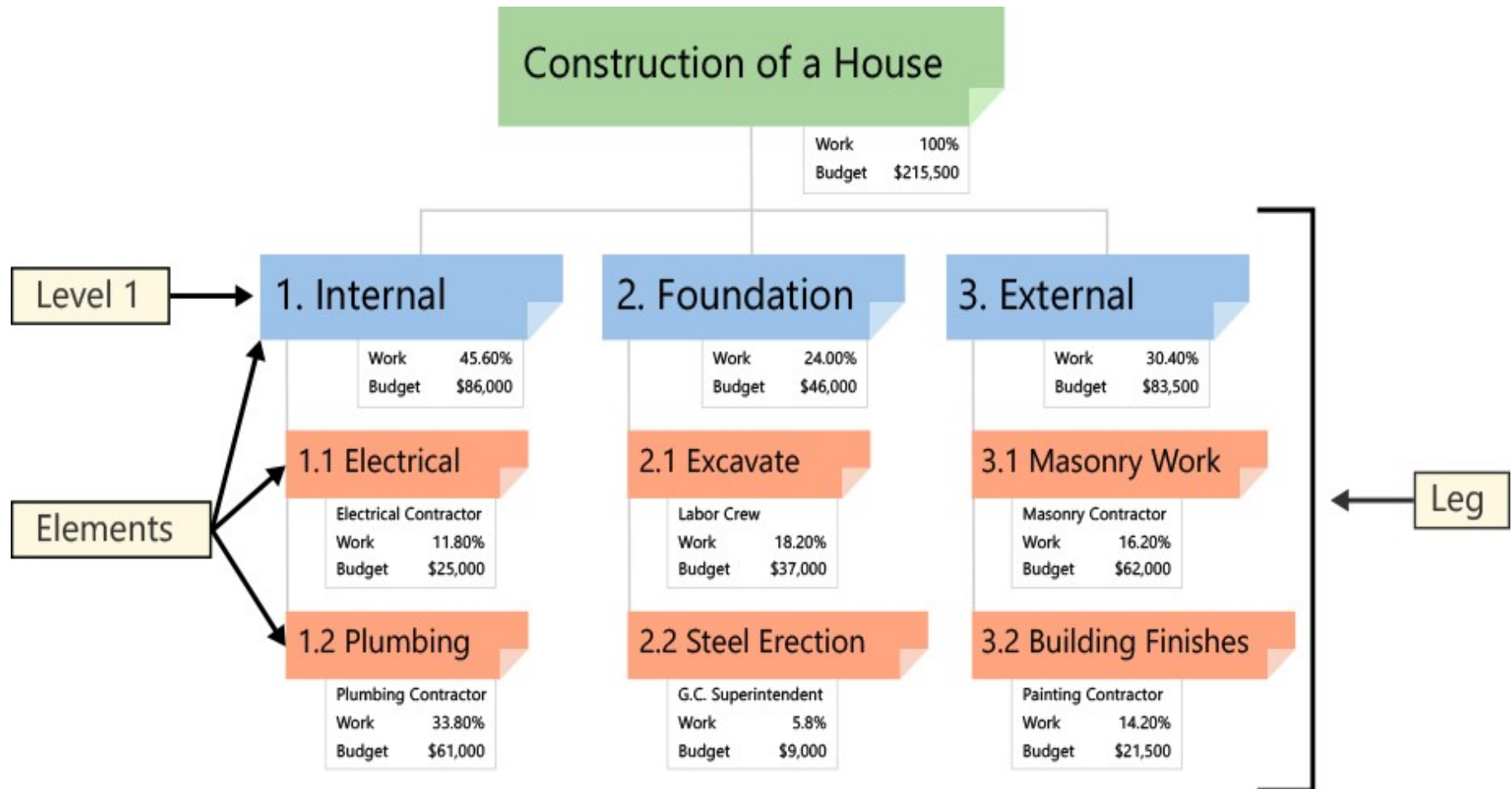- It helps you to Develop a **schedule**.

Levels of WBS

- A **Work Breakdown Structure** is a higher **level** project artifact that supports the creation of schedules and budgets.

- The **WBS** is a hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables.

- The **WBS** contains 100% of all the **work** in the project.

- At the top **level** is the project ultimate goal.

- the second **level** contains the project objectives.

- the third **level** has the project outputs.

- the fourth **level** with activities.

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Example of WBS

Lecture 13 – Work Breakdown structure (WBS) and linear responsibility chart

Example of WBS

- ## Redecorate Room
  - Prepare materials
    - Buy paint
    - Buy a ladder
    - Buy brushes/rollers
    - Buy wallpaper remover
  - Prepare room
    - Remove old wallpaper
    - Remove detachable decorations
    - Cover floor with old newspapers
    - Cover electrical outlets/switches with tape
    - Cover furniture with sheets
  - Paint the room
  - Clean up the room
    - Dispose or store left over paint
    - Clean brushes/rollers
    - Dispose of old newspapers
    - Remove covers

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Example of WBS

a **WBS example** for an aircraft system:

- one group responsible for building an aircraft.

- Within this group, you might have one team focused on building the airframe another on creating a propulsion system, and so on.

- It's common to have three levels of decomposition in the **WBS**

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WBS Dictionary

- A document that provides detailed information about deliverables, activity and scheduling of each component in the **Work Breakdown Structure** (**WBS**).

- The **WBS Dictionary** describes each component of the **WBS** with milestones, deliverables, activities, scope, and sometimes dates, resources, costs, quality.

- WBS elements should be cross-referenced as appropriate.

- there are three typical ways in structuring works with a **Work Breakdown Structure** (**WBS**). They includes **phase-based structures**, d**eliverable-based structures** and **responsibility-based structures**.

Product Breakdown Structure

- Focus on the product to be delivered and not on the work to do.
- Redecorated Room
  - Removed old wallpaper
  - Clean room
    - Cover for furniture
    - Cover for electrical switches
    - Newspapers to cover floor.
  - Paint
    - Paint on wall
    - Leftover paint
  - Management products
    - Ladder
    - Brushes and rollers

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Linear Responsibility Chart

- It is another visual depiction of the roles and responsibilities on a **project**.

- These charts list **tasks** on one axis and the **responsible persons or departments** on the other.

- It basically combines the WBS against the types of resources available.

- This is extremely useful for the **project manager**, as it visually depicts who is responsible for each **project** task

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WBS Linear Responsibility Chart

		Responsibility					
WBS		Project Office					Field Oper.
Subproject	Task	Project Manager	Contract Admin.	Project Eng.	Industrial Eng.		Field Manager
Determine	A1	○		●	▲		
need	A2	■	○	▲	●		
Solicit quotations	B1	○	■	▲			●
Write approp.	C1	■	▲	○	●		
request.	C2		●	○	▲		
	C3	●	■	▲			■
"	"						
"	"						
"	"						

Legend:
▲ Responsible
● Support
■ Notification
○ Approval

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Linear Responsibility Chart

Activity/ Responsibility	General Manager	Manager of Project	Project Manager	Functional Manager
Establish department's objective and policies	1	3	3	3
Integration of projects	2	1	3	3
Project Direction	4	2	1	3
Project Planning	4	2	1	3
Functional Planning	2	4	3	1
Funtional Direction	2	4	5	1
Project functional conflict resolution	1	3	3	3
Project Budget	4	6	1	3
Project work breakdown structure	4	6	1	3
Project Control	4	2	1	3
Functional control	2	4	3	1

1 Actual responsibility   4 May be consulted
2 General supervision   5 Must be notified
3 Must be consulted   6 Final approval

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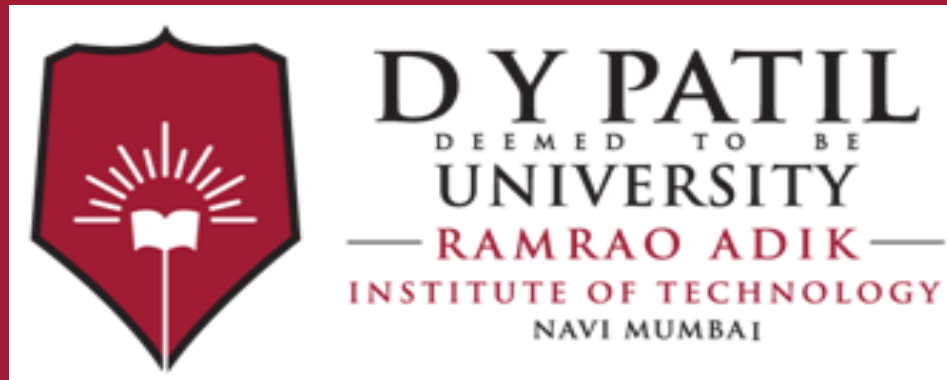INSTITUTE OF TECHNOLOGY
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Linear Responsibility Chart

	Vice-president	General manager	Project manager	Manager engineering	Manager software	Manager manufacturing	Manager marketing	Subprogram manager manufacturing	Subprogram manager software	Subprogram manager hardware	Subprogram manager services
Establish project plan	6	2	1	3	3	3	3	4	4	4	4
Define WBS		5	1	3	3	3	3	3	3	3	3
Establish hardware specs		2	3	1	4	4	4				
Establish software specs		2	3	4	1		4				
Establish interface specs		2	3	1	4	4	4				
Establish manufacturing specs		2	3	4	4	1	4				
Define documentation		2	1	4	4	4	4				
Establish market plan	5	3	5	4	4	4	1				
Prepare labor estimate			3	1	1	1		4	4	4	4
Prepare equipment cost estimate		3	1	1	1			4	4	4	4
Prepare material costs			3	1	1	1		4	4	4	4
Make program assignments			3	1	1	1		4	4	4	4
Establish time schedules		5	3	1	1	1	3	4	4	4	4

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Thank You