Introduction to Project Management

Course Objectives

- To provide participants with:
  - An awareness of the importance of applying good practice Project Management in projects of any size.
  - An understanding of essential elements, including the Leadership Role of the Project Manager, Project Planning, Risk Management and Stakeholder Engagement.
  - An understanding of the principle elements of design control to be applied within projects at Culham.

What is a Project?

"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 constraints of time, cost, quality and resources"

- A Project is a planned set of activities
- A Project has a scope
- A Project has time, cost, quality and resource constraints

What is Project Management?

- The art of organising, leading, reporting and completing a project through people

What is Project Management?

- A project is a planned undertaking
- A project manager is a person who causes things to happen
- Therefore, project management is causing a planned undertaking to happen.

Exercise 1

- Write down three attributes of a good Project Manager

Project Manager Role

- A Good Project Manager
  - Takes ownership of the whole project
  - Is proactive not reactive
  - Adequately plans the project
  - Is Authoritative (**NOT** Authoritarian)
  - Is Decisive
  - Is a Good Communicator
  - Manages by data and facts not uniformed optimism
  - Leads by example
  - Has sound Judgement
  - Is a Motivator
  - Is Diplomatic
  - Can Delegate

Stakeholder Engagement

Stakeholder

"A person or group of people who have a vested interest in the success of an organization and the environment in which the organization operates"

Exercise 2

- Write down three typical project stakeholders

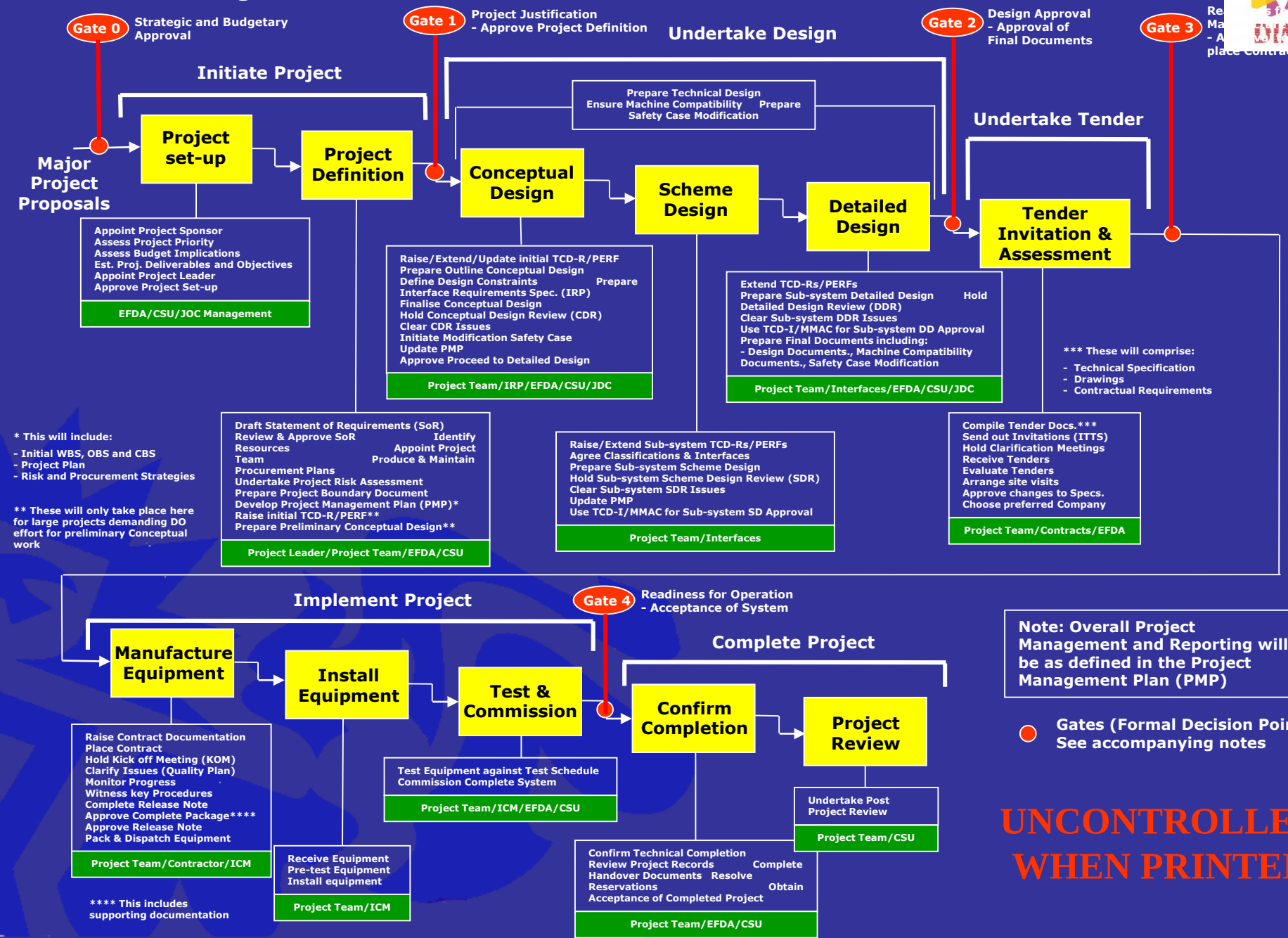
Exercise 2 - Typical Stakeholders

- Sponsor
- Funding Body
- Customer
- Suppliers
- End User
- HSE/Environmental Agency
- Maintenance Team
- Neighbours/Community/Shareholders
- Fusion Community
- Interfaces

Stakeholder Engagement process

- Identify Stakeholders
- Assess needs
- Define actions
- Establish communication channels
- Gather feedback
- Monitor and review

The Project Process



Key Points in Project Set-up and Definition

- Create Project Management Plan (PMP)
- Be clear of scope and objectives
- Establish clear statement of what is to be done (WBS)
- Establish Risks to be Managed
- Establish Costs and Durations
- Establish Resources Required

Project management Plan - PMP

- Master Document for Project
- Defines the following:-
  - Project Objectives, Scope, Deliverables
  - Stakeholders (Internal & External)
  - Work to be done (WBS)
  - Project Organisation and Resources (OBS)
  - Project Costings (CBS)
  - Project Schedule
  - Procurement/Contract Strategy
  - Risk Management
  - Quality management
  - Change Management

Project Planning

Project Planning

- Adequate planning leads to the correct completion of work

Planning

- Inadequate planning leads to frustration towards the end of the project & poor project performance

Project Start

Project End

Work Breakdown Structure (WBS)

- The Work Breakdown Structure is the foundation for effective project planning, costing and management.
- It is the most important aspect in setting-up a Project
- It is the foundation on which everything else builds

Work Breakdown Structure - Definition

"A Work Breakdown Structure (WBS) is a hierarchical (from general to specific) tree structure of deliverables and tasks that need to be performed to complete a project."

Project Planning – WBS (1)

- Lowest Level of WBS is the Work Package (WP)
- WP can be clearly defined allowing package to be costed, scheduled and resourced
- WP contains a list of Tasks to be Performed that form the basis for the Schedule
- WP allows assignment of responsibilities (Work Package Manger, WPM)

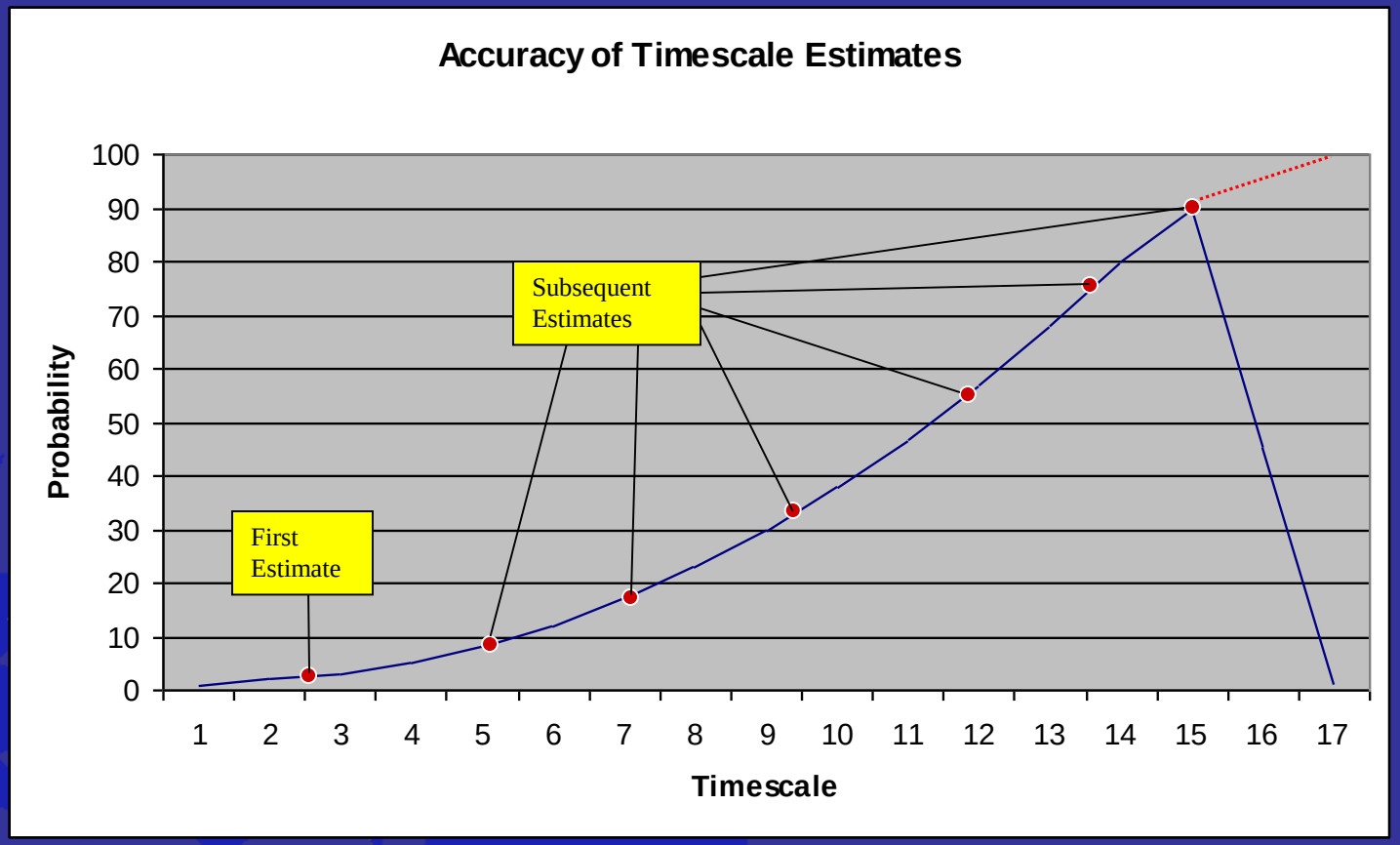
Project Planning – WBS (2)

- WBS allows hierarchical build-up of costs and schedule
- Cost and Schedule can be reported at any level of the WBS
- WBS facilitates strong management during project execution (Cost and Schedule control)
- WBS can be used for many other things - Document Management, Risk Management etc.

Project Planning

- A word about Scheduling
  - Schedules (task durations) can have a wide variation
  - There is no unique answer. Rather, there is a statistical variation depending on assumptions
  - Need to understand the basis of scheduling (Most challenging; Most likely; Absolute certainty - bet your life on it!)
  - Most people are very optimistic/naive

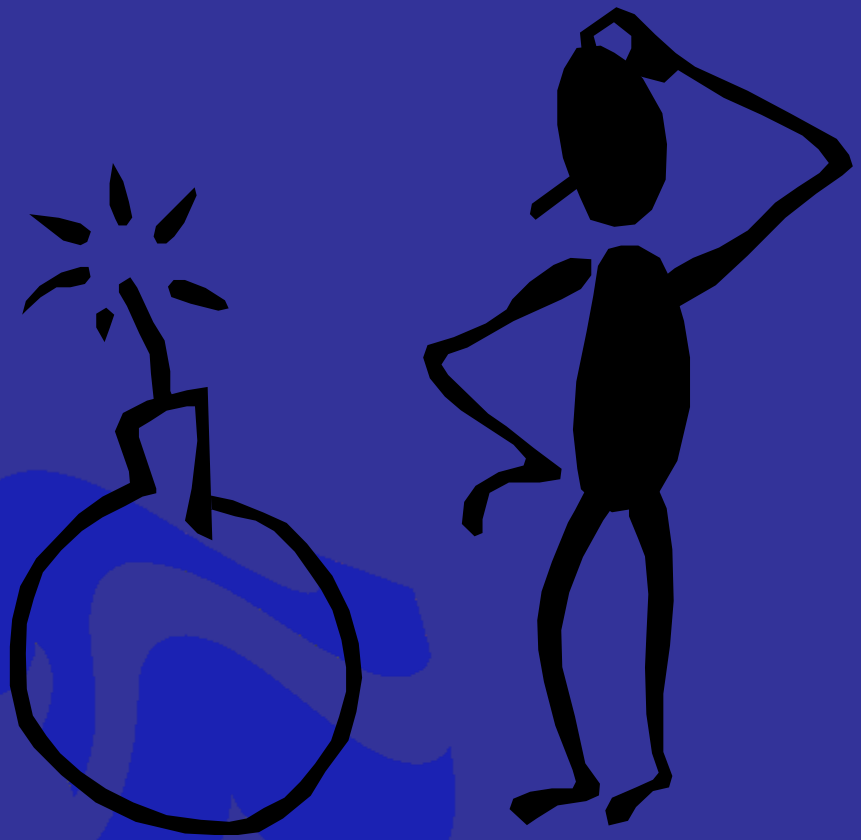
Common schedule development



Project Planning – Key Points

- Recognise that adequate project planning is essential
- Produce a sound WBS
- Use the framework provided by the Project Management Plan (PMP) template
- Involve the right people
- Allow enough time
- Be systematic

Project Risk Management



Project Risk – Definition (1)

"Project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on a project objective"

Project Risk – Definition (2)

"A combination of the probability of a defined threat or opportunity (Likelihood) and the magnitude of the consequences of the occurrence (Impact) defines a Risk Index"

Risk Impact

Threat → Scope → Poor Quality Product

Threat → Schedule → Late Delivery

Threat → Cost → Overspend

- In addition there are health, safety and environmental threats that **must** be managed (CDM Regulations)

Risk Management Process

- Identify Risks
- Assess likelihood and impact
- Rank risks and prioritise
- Define risk management approach & actions
- Implement actions
- Monitor & review

Risk Management – Key Points

- Make the management of risk integral to the way the project is managed
- Ensure that cost and time contingencies are consistent with identified risks
- Focus on the “significant few” – don’t try to manage too many risks
- Be vigilant and proactive

Project Monitoring and Control

Exercise 3

- Write down three typical project control/monitoring activities

Project Monitoring

- Typical Monitoring Activities
  - regular reviews of progress against schedule using WBS as basis (Plan against Baseline)
  - regular review of actual costs against budgeted costs and Earned Value at WBS level
  - regular review of resource loading
  - regular progress meetings with project team
  - regular meetings with contractors
  - production of periodic progress reports
  - risk reviews
  - inspections/ audits

Project Control

- Typical Control Activities
  - assign responsibilities at Work Package level
  - staged authorisation of work to be done
  - staged release of budgets (staged release of WBS(e) numbers)
  - ensure PM has a ‘Management Reserve’ under his control
  - seek corrective action reports when WPs go ‘off track’ (overrunning or overspending)
  - release Management Reserve carefully

Project Monitoring and Control Summary

- Monitor against the plan – status regularly
- Take a factual approach to decisions
- Identify management action early
- Check that defined controls are being applied – correct if necessary
- Apply change control

Introduction to Design Management

Design Management

- Design takes place as part of a project
- Design Management is part of Project Management
- Design Management considerations must be included in the PMP

Exercise 4

- Write down three Design Management Activities

Exercise 4 - Design Management Activities

- Sub-divide Design Stages
- Sub-divide Tasks (WBS)
- Define Constraints and Interfaces (WPD Summary Sheet)
- Formally Initiate the Design
- Ensure Design conforms to Requirements
- Hold Design Reviews (Peer review)
- Formally Approve Design

Design Stages

- Conceptual Design
- Scheme Design
- Detailed Design

Conceptual Design Phase

- Develop Conceptual Design
- Define Constraints & Interfaces
- Carry out Conceptual Design Review
- Initiate Safety Case Modification if required
- Obtain Approval to Proceed to next stage

Scheme and Detailed Design

- Basic considerations and process similar to concept
- Need to ensure that safety & environmental issues receive proper consideration as design develops (CDM Regulations)

Exercise 5

- List who should be invited to a design review
- Write down three issues that should be considered at a design review

Exercise 5 - Design Reviews, Attendance

- Project Leader or nominee (Chairman)
- RO (Work Package Manager)
- Customer
- End User
- Safety and Quality Reps
- All other Relevant Interfaces/Stakeholders
- Other Experts in the area being reviewed

Exercise 5 - Design Reviews, Issues to Consider

- Assumptions and Constraints
- Technical Solutions - Does it meet the Spec?
- Safety, Environment and CDM issues
- Can it be Manufactured/Maintained?
- Actions from previous DRs
- Issues to be resolved (including Timescales)

Safety & Environment

- Need to ensure that safety & environmental issues receive proper consideration as design develops
  - Involve the right people from the start
  - Systematically identify issues – Hazards/Risks, Environmental Aspects & Impacts
  - Carry out rigorous reviews at each design stage
  - Control Design Changes
- MUST take note of CDM Regulations

CDM Regulations

- CDM - Construction (Design & Management)
- Regulations recently updated
- Now must have someone in EACH Project Responsible for CDM
- Currently information is on the Conceptual, Scheme & Detailed Design steps on the Process Maps
- More information will be developed over the coming months

Design Change control

- Needs to be a formal and defined procedure
- New procedure in place Facilities

Confirm Completion

- Ensure design records are complete and accurate
- Ensure any outstanding actions or issues are addressed
- Ensure Maintenance Records are produced
- Ensure User Manuals are produced
- Hold a formal Post Project review

Main Causes of Project Failure.

- **Poor Preparation**
- You need to have a clear picture of what you're going to do, in advance – as much as possible.
- Otherwise, you may find yourself up stream without a paddle.
- You need to know what project success looks like at the beginning and don't loose focus of it.
- Hence, if you don't have a clear focus at the at the earliest stage of the process,

Main Causes of Project Failure.

- you are making things harder on yourself.
- Have a meeting, even if it is lengthy, with stakeholders to discuss their expectations on cost, time and product quality.
- Know how you will execute your tasks in order to meet everyone’s expectations.

- **Inadequate Documentation and Tracking**
- This is the responsibility of the project manager.
- Tracking milestones is how you are going to know whether you are meeting expectations.
- Proper recording and monitoring lets the PM identify where more resources are needed to complete a project on time.

- **Bad Leadership**
- When we see this word, leader, we usually think, the project manager.
- However, the people at each management-level have a responsible to ensure that the project is successful.
- Management should not micromanage but provide support to ensure that the PM can follow through with the expectations placed upon them.

- **Failure to Define Parameters and Enforce Them**
- When you’re a leader, PM, it’s essential that you’re able to work well with your team.
- If and when tasks or goals are not met to standard, there should be ramifications.
- Rank tasks by priority and assign them to the most proficient individual.

- **Inexperienced Project Managers**
- A project manager has a lot of responsibility.
- You need to assign people to management roles who have matching education and experience.
- In some cases, and perhaps more often than not, inexperienced managers are given projects.
- They may be very capable of managing projects, but the key is to keep them at a level where they can succeed.
- Otherwise, you will set them up for failure.
- On the other hand, there's nothing wrong with a challenge, just don't make it beyond their reach.

- **Inaccurate Cost Estimations**
- There may be times when your cost estimates are completely off.
- As you know, when resources run-out, the project stops.
- Prevent this by identifying the lack of resources early on.

- **Little Communication at Every Level of Management**
- Whether it’s between upper management, middle or with the team,
- it’s disastrous to have poor communication.
- Everyone should feel free to come forward to express their concern or give suggestions.
- When everyone is on the same page and there’s transparency, workflow is at an optimum level.

- **Culture or Ethical Misalignment**
- Company culture must be comprised of competence, pro-activeness, and professionalism.
- If it isn't, team members will not be motivated to do their best.
- Basically, everyone involved must be invested in their part of the project to successfully complete it.

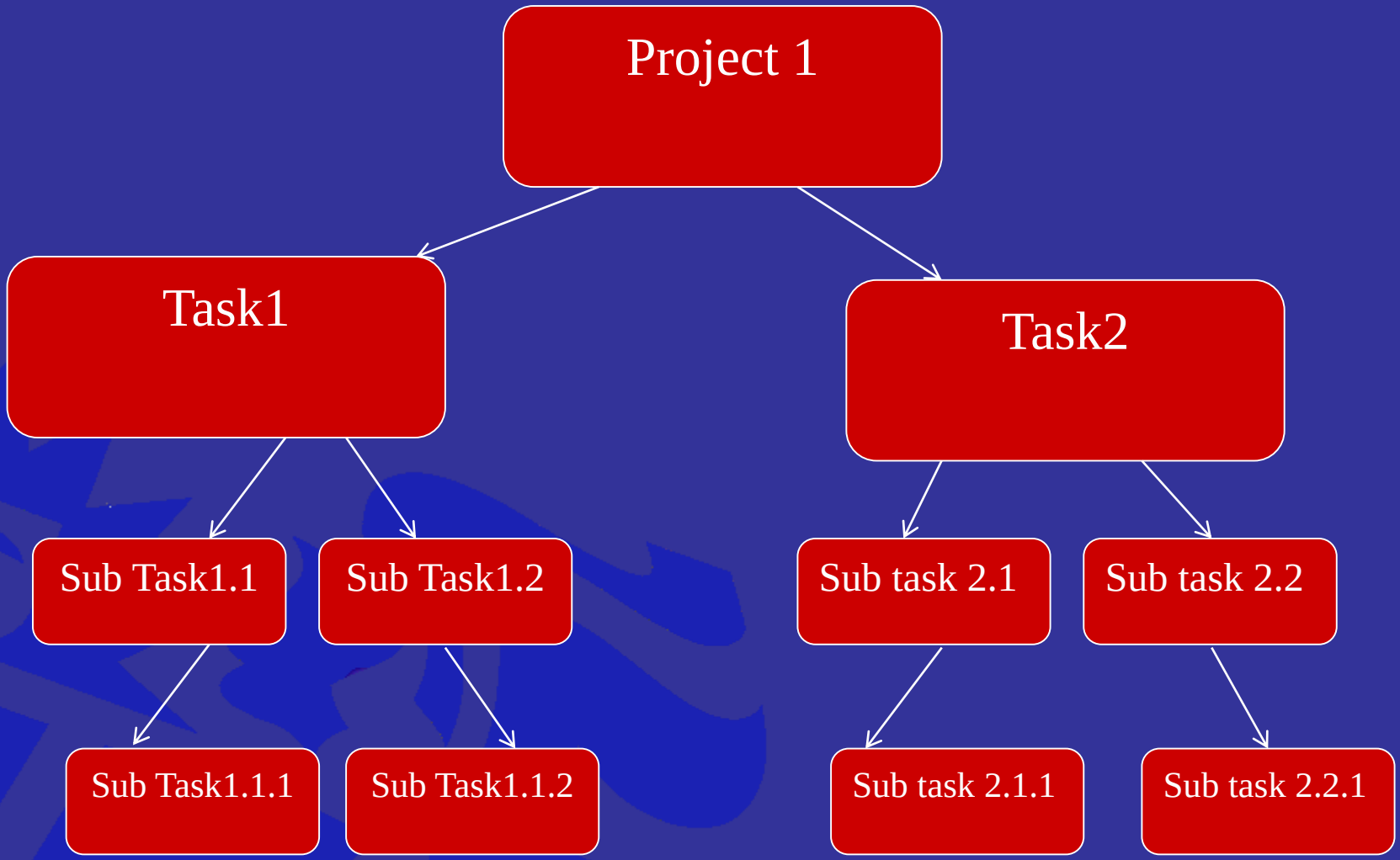
- **Competing Priorities**
- When there’re not enough resources, there’s bound to be competition between personnel resources and funding.
- Having good cost estimations at the start will eliminate this problem.

- **Disregarding Project Warning Signs**
- When a project is on the verge of failing,
- there will have always been warning signs.
- Taking action immediately can save the project.
- Otherwise, the whole endeavor goes down the drain.

Work breakdown structure

- Introduction: Dividing complex projects to simpler and manageable tasks is the process identified as Work Breakdown Structure (WBS).
- Usually, the project managers use this method for simplifying the project execution.
- In WBS, much larger tasks are broken-down to manageable chunks of work.
- These chunks can be easily supervised and estimated.

- A work breakdown structure
- In project management and systems engineering, is a deliverable oriented decomposition of a project into smaller components.
- A work breakdown structure element may be a product, data, a service, or any combination.
- A WBS also provides the necessary framework for detailed cost estimating and control along with providing guidance for schedule development and control


Project 1
Task1
Task2
Sub Task1.1
Sub Task1.2
Sub task 2.1
Sub task 2.2
Sub Task1.1.1
Sub Task1.1.2
Sub task 2.1.1
Sub task 2.2.1

- WBS helps manager
- Facilitates evaluation of cost, time, and technical performance of the organization on a project.
- Provides management with information appropriate to each organizational level.
- Helps in the development of the organization.
- breakdown structure which assigns project responsibilities to organizational units and individuals◦
- Helps manager plan, schedule, and budget.◦
- Defines communication channels and assists in coordinating the various project elements.

- few reasons for creating a WBS in a project.
- Accurate and readable project organization.
- Accurate assignment of responsibilities to the project team.
- Indicates the project milestones and control points.
- Helps to estimate the cost, time, and risk.
- Illustrate the project scope, so the stakeholders can have a better understanding of the same

- Purpose of WBS
- There are three reasons to use a WBS in your projects:
- first is that is helps more accurately and specifically define and organize the scope of the total project.
- The second reason for using a WBS in your projects is to help with assigning responsibilities, resource allocation, monitoring the project, and controlling the project
- Finally, it allows you double check all the deliverables specifics with the stakeholders and make sure there is nothing missing or overlapping.

- Process of WBS
- First, lets look at what all we need to get started.
- There are several inputs you will need to get you off on the right foot:
- The Project Scope Statement
- The Project Scope Management Plan
- Organizational Process Assets
- Approved Change Requests - (PMBOK Guide)

- Process of WBS
- You will use certain tools as well:
- Work Breakdown Structure Templates
- Decomposition

- Process of WBS
- Finally, using these inputs and tools you will create the following outputs:
- Work Breakdown Structure
- WBS Dictionary
- Scope Baseline
- Project Scope Statement (updates) project Scope Management Plan (updates)
- Requested Changes - (PMBOK Guide)

- How to build a WBS
- Begin with the Charter, focusing on Objectives and Deliverables
- Break the main product(s) down into sub-products Set the structure to match how you'll manage the project Lowest level not too detailed, not too large Is there a need for Integration? Identify support activities Check for completeness - is all the effort included? Develop a coding structure if needed Assign work package managers

- _Pitfalls
- There are common pitfalls to creating a WBS.
- If you can keep these few possible, you and your team will be much more successful at creating a useful and accurate Work Breakdown Structure.
- Level of Work Package Detail
- Deliverables Not Activities or Tasks
- WBS is not a Plan or Schedule
- WBS Updates Require Change Control
- WBS is not an Organizational Hierarchy

- Following are a few reasons for creating a WBS in a project
- Accurate and readable project organization.
- Accurate assignment of responsibilities to the project team.
- Indicates the project milestones and control points.
- Helps to estimate the cost, time, and risk.
- Illustrate the project scope, so the stakeholders can have a better understanding of the same.

- Construction of a WBS
- Identifying the main deliverables of a project is the starting point for deriving a work breakdown structure.
- This important step is usually done by the project managers and the subject matter experts (SMEs) involved in the project.
- Once this step is completed, the subject matter experts start breaking down the high-level tasks into smaller chunks of work.
- In the process of breaking down the tasks, one can break them down into different levels of detail.
- One can detail a high level task into ten sub tasks while another can detail the same high level task into 20 sub tasks.

- Goals For WBS
- Giving visibility to important work efforts.
- Giving visibility to risky work efforts.
- Illustrate the correlation between the activities and deliverables.
- Show clear ownership by task leaders.