ICT Project Management

Project Baseline and Work Breakdown Structure

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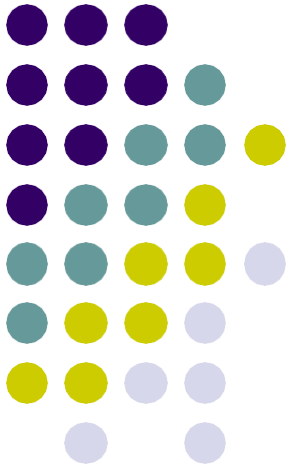


Basic stages of project management

- Needs identification for a new product / service
- Definition of project objectives and their relative importance
  - Choice of appropriate performance indicators
- Project design
  - Scheduling
  - Budgeting
  - Technological support
- Program implementation
- Project tracking and control
- Project success evaluation

PM² Methodology

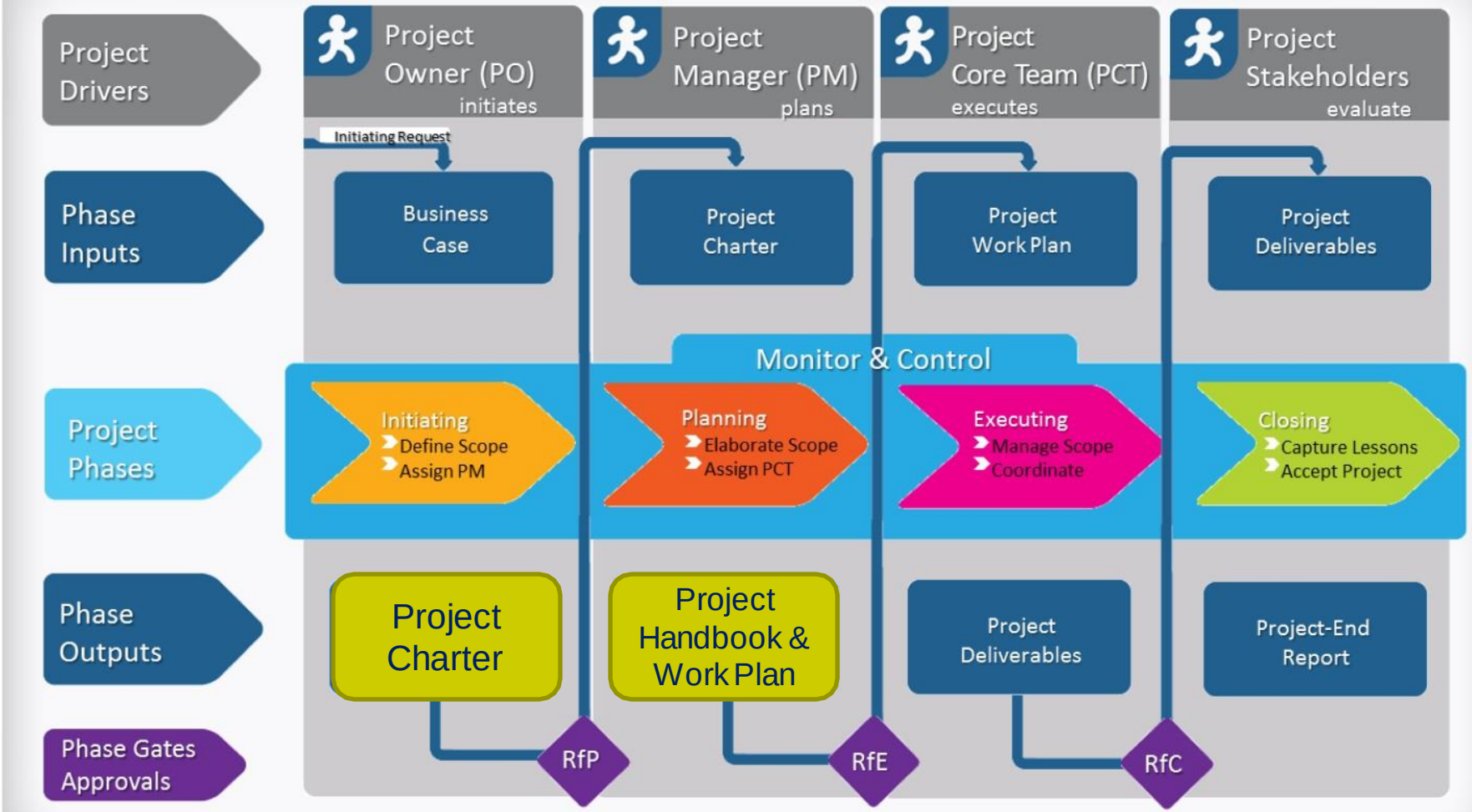
- PM² is a Project Management Methodology developed by the European Commission.
- Its purpose is to enable Project Managers (PMs) to deliver solutions and benefits to their organisations by effectively managing project work.
- PM² has been created considering the environment and needs of EU Institutions and projects, in order to facilitate the management of projects' complete lifecycle.

The PM² Methodology

- PM² incorporates elements from
  - a wide range of globally accepted project management best practices, described in standards and methodologies,
  - as well as relevant European Commission communications and operational experience from various internal and external projects.

High level view of the PM²

Drivers, Phases, Input/Outputs



PM² Drivers, Phases, Input/Outputs

- Projects depend on people to define, plan, execute and generally drive them throughout their lifecycle.
- The project drivers differ from phase to phase within a PM² project:
  - the Project Owner (PO) is the main driver during the initiation of the project (initiates the project and is accountable for all documentation),
  - while the Project Manager (PM) drives the Planning Phase (is responsible for coordinating the delivery of all project plans).
  - The Project Core Team (PCT) drives the execution of the project plan and the creation of the project deliverables
  - while the project stakeholders are the main drivers of the Closing Phase as they evaluate the project deliverables and overall performance.

Phase Gates and Approvals

- At the end of each phase, the project passes through an approval gate. This is to ensure that the Project Steering Committee (PSC) reviews the project before it moves on to the next phase.
- These checkpoints contribute to the overall quality of the Project Management and allow the project to proceed in a controlled way.
- **The PM² phase gates are:**
  - **RfP** (Ready for Planning): At the end of the Initiating Phase.
  - **RfE** (Ready for Executing): At the end of the Planning Phase.
  - **RfC** (Ready for Closing): At the end of the Executing Phase.

The PM² Lifecycle

- The PM² project lifecycle has four phases. Each phase represents a period of time in the life of the project during which similar type of activities are executed (e.g. planning type activities ‘peak’ in terms of effort during the planning phase, etc.).
- Note that the interfaces between phases are almost never clearly separated as activities related to a specific phase (e.g. planning activities) continue to be executed during the next phase(s) (e.g. Executing Phase).
- Therefore, phases are defined by convention: at a given moment a project's phase is declared as the output decision of a phase gate.

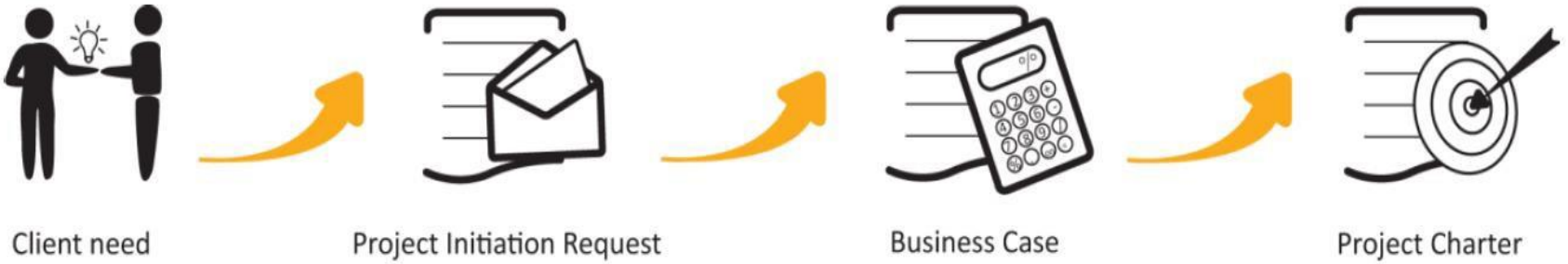
PM² Phases

Project Phases	Description
1. Initiating	Define the desired outcomes, create a Business Case, define the project scope, and get the project off to a good start.
2. Planning	Assign the Project Core Team, elaborate the project scope, and plan the work.
3. Executing	Coordinate the execution of the project plans. The team produces the project's deliverables.
4. Closing	Coordinate the project's formal acceptance, report on the project's performance, capture lessons learned and post project recommendations, and administratively close the project.
Monitor & Control: Throughout the project's duration, monitor and control all project work and management activities. Monitor project variables, measure progress, manage changes, address risks and issues and identify corrective actions as per the project's needs.	

Initiating Phase

- The first phase of a PM² project is the Initiating Phase. Its purpose is to define what the project will do (formulate the project's objective), make sure the project is aligned to the organisation's strategic objectives, get the project off to a good start by performing some initial planning, and provide the necessary information to get approval to continue to the Planning Phase.
- The main input for this phase is a (client) request for addressing a need, problem or opportunity.

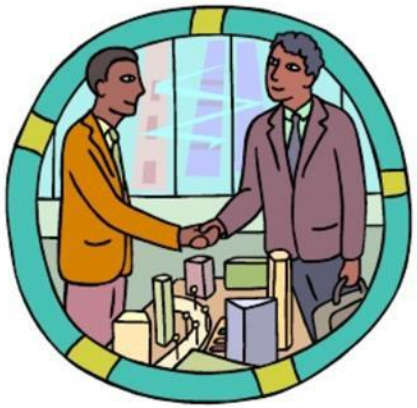
Overview of the Initiating Phase



- The following activities are part of the Initiating Phase:
  - **Creation of the Project Initiation Request.** This contains information about the requestor, business needs and desired project outcomes.
  - **Creation of the Business Case.** The Business Case provides the project justification and defines budgetary requirements. Typical document sections include the business context, problem descriptions, project description, possible alternative solutions, costs, and timescale.
  - **Creation of the Project Charter.** This document provides more details on the project definition in terms of scope, cost, time, and risk. It also includes information such as milestones, deliverables and project organisation.

Project Initiation Phase

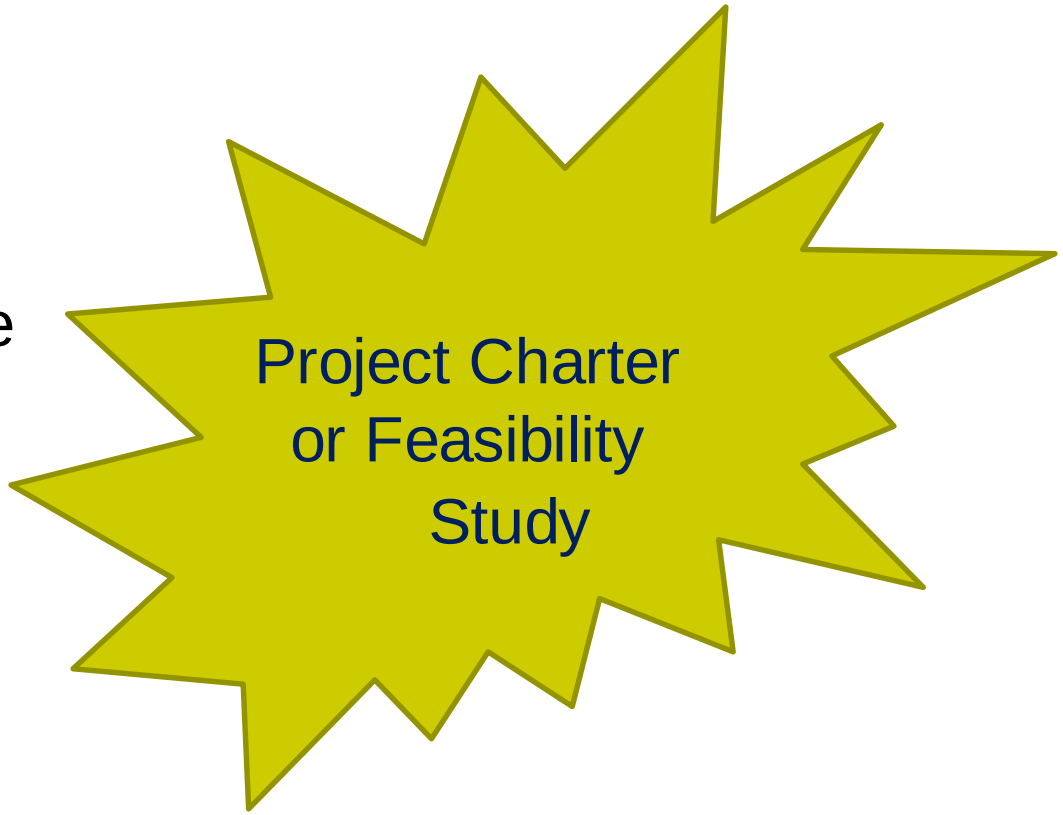
- Initiation Phase
  - This phase is the moment when an idea is approved and funded to become a project.
  - Involves some planning and assessments.
- The main actions in this phase are:
  - The idea of the project (concept)
  - Approval of the idea
  - Project proposal
  - Approval of the Proposal
  - Negotiations
  - Project Contract



Project Initiation Phase

- Identify the problem/need
- Establish Feasibility
  - Preliminary budget
  - Preliminary Schedule
  - Risks
  - Project Team
- Identify Alternatives
- Present Proposal

- What is needed?



Objective - Feasibility study

1. Identify the problem / idea.
2. Describe the current situation and identify the main problems.
3. Describe alternatives.
4. For each alternative, it is estimated:
    1. Estimated time and cost of implementation
    2. Required means and staff (total cost estimate)
    3. Expected benefits
    4. Critical success factors
5. To propose a solution.

A feasibility study is a well-documented expression of the results of research that has been conducted and essentially determines whether the project can be successfully implemented.

Project Charter Feasibility study

- Convincing statements that the project is necessary, feasible and will have positive results.
- Indicative Content:
  - Executive Summary
  - Description of proposed solution / technology by reference
  - the benefits that will arise,
  - the advantages over the alternatives,
  - successful applications / uses in other cases or businesses, etc.
- Implications of its realisation, e.g.
  - which users are affected,
  - how long will it take for full operation,
  - interoperability issues, etc.
- Cost estimate (not budget, not the cost of non-implementation)
- Scheduling
- Recommended actions (plan)

What is the problem?

- Having described the Business Case, possible solutions, etc., we are not yet ready to define its subject clearly.
- Let your administration ask you: "How long will the project last?"
- You may answer: "About 2-6 months"
- But such a (approximating) answer can be confusing ...
  - We believe that even ending the project before six months is acceptable, while
  - Management believes that with a little hard work it may end in two months.

The solution …

- In fact, we do not know how much time it will take, since we do not know clearly what work to do.
- Solution: Method "Divide and Conquer"
- To give a good answer, we have to break the work that needs to be done in smaller sub-projects for which we can (as far as possible) make good estimates of times.
- And from these estimates we estimate the estimated implementation time (and cost) for the project.

Work Breakdown Structure

Work Breakdown Structure (WBS)

- First, let's start with some basics; the PMBOK® describes the work breakdown structure as "a deliverable-oriented hierarchical decomposition of the work to be executed by the team".
- This is a way of describing the work so that the team knows exactly what work is needed in order to meet the goals of the project.
- It helps to provide clarity of the scope for the project and "breaks down" the scope into whole work units.
- A work breakdown structure is deliverable-oriented.
- So what is a deliverable? In a word, it can best be described as a noun.
  - What is the difference between "write xyz specifications" and "xyz specifications"?
  - One describes the end product and the other describes a single step to produce it.
  - The end product is described as a noun without a verb. When you start using verbs, then you are in another process of the PMBOK: Define Activities !

Work Breakdown Structure

- Work Breakdown structure is the hierarchy of what needs to be achieved
- Sometimes it is said that project management is just a lot of different breakdown structures

Work Breakdown Structures

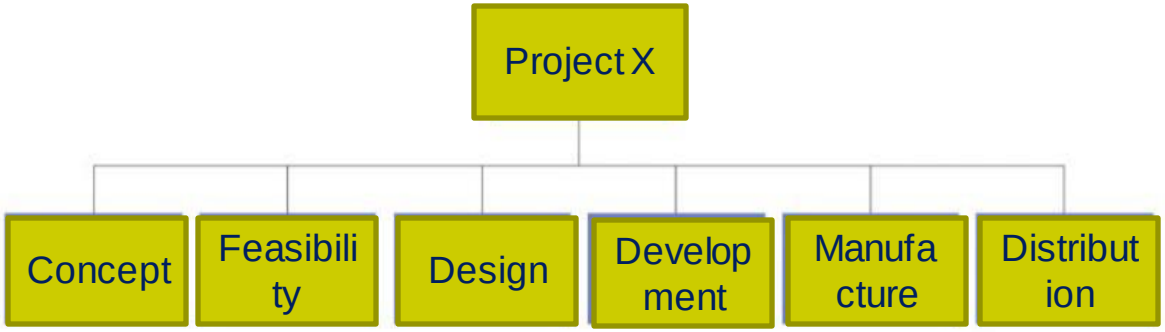
- A project can be broken into work packages
- This is not to be confused with the phases of a project – although they may be the same!
- Before we start – are the objectives clear?
- Clarity of Objectives
  - There is not point in trying to breakdown the project for which the objectives are not clear.

Breakdown Structures

- PBS: Product Breakdown Structure
  - A hierarchy of products
- WBS: Work Breakdown Structure
  - A hierarchy of work
- CBS: Cost Breakdown Structure
  - Budgets – allocating expenditure
- OBS: Organisation Breakdown Structure
  - The organization Chart and more

WBS
Breaking a project down to its phases

- Breaking a project down to its phases
- This might be enough detail for top management (strategic management), e.g.
  - When does the design finish
  - When does development finish
  - When does distribution start



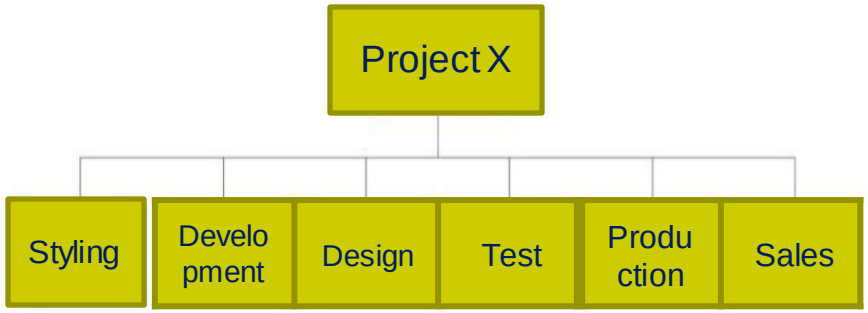
- ❖ Second level of WBS based on phases
- ❖ This may be enough detail for the strategic plan

WBS

Breaking a project down based on functional units

- Another way of breaking down the project is by organisational department
- This is particularly useful for functionally based organisations
- Some organisations are functional based, i.e. based on functional units
- We are looking at the same project, but now the various WPs are essentially done by different departments.
- Anything that is done by the design or sales department goes under the relevant WPs

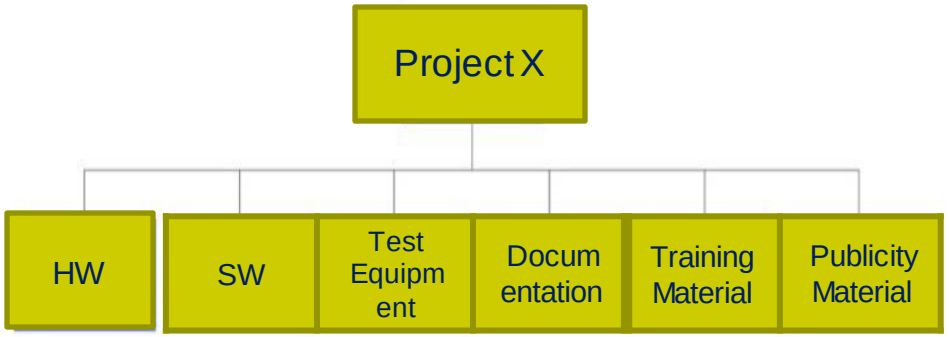
- The same project could be broken down as:



- ❖ Second level of WBS based on departments

Work Breakdown Structures

- A third way of representing the same project would be to brea' it into its constituent products.
- This is particularly usefu for complex or modular projects
- E.g. mobile phone
  - Camera, gsm, gps, manual, packaging, etc
  - It is a modular device.



❖ The second level of analysis is based on product categories

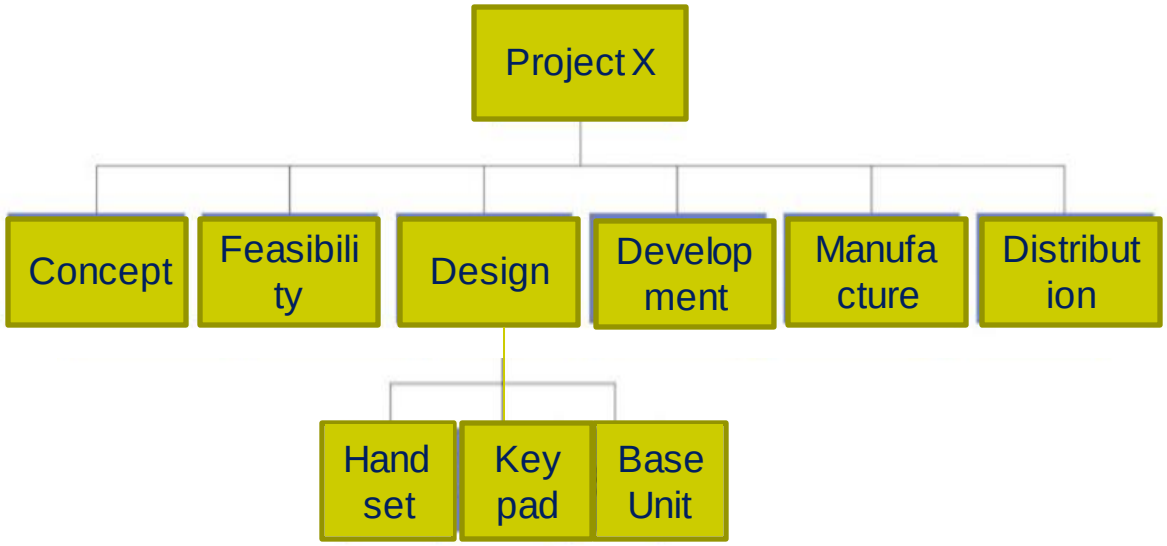
Work Breakdown Structures

- There is no right way and wrong way
- If I gave you students the same project, you could produce a large number of designs (WBS)
- They could all be different and they may all be right too.
- The main question is:
  - Have you included everything that needs to be done to deliver this project

- Any combination of these three methods can be used
  - Phase
  - Organisation
  - Product
  - Any combination of the above 3

Work Breakdown Structures

- Whichever method is used, the work packages can then be broken into activities.
- This third level of detail might be enough for the middle management, the operational level.
- This may be enough detail for the operational plan.

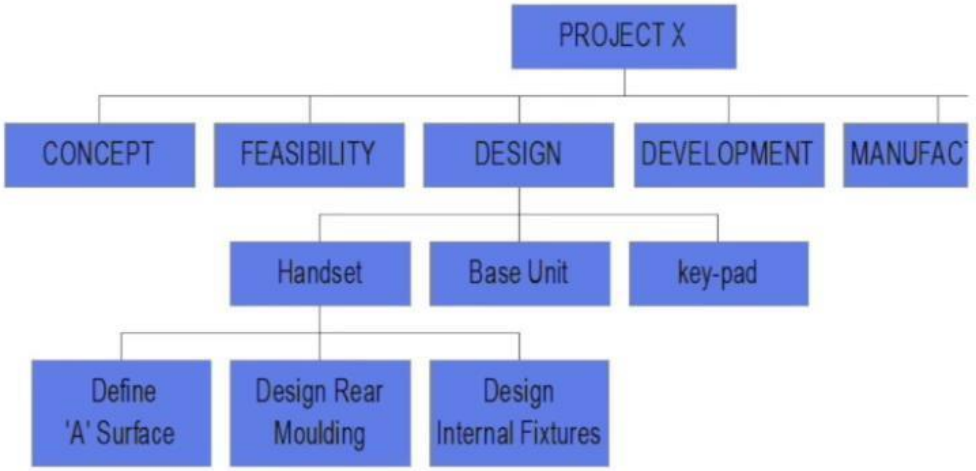


Work Breakdown Structures

- Activities can then be broken into tasks
- What we are looking at the task level is a verb-noun combination
- If possible make these a **"verb-noun" composition**
  - Create detailed Architectural specifications
  - Establish HW Costs
  - Test Signal Processing Components
- Because someone is going to be doing this.
- So instead of having a task called "switches" we want to
  - "specify switches",
  - "purchase switches",
  - "install switches".
- A verb – noun combination makes it absolutely clear what this task is all about.

Work Breakdown Structures

- This would make for 4 levels in the WBS
- The WBS needs to be as detailed as the project requires
- Big projects – more details



This needs to be detailed enough for the day-to-day plan

WBS - Characteristics

- In the WBS:
- There is no time dimension.
  - The location of an WP is not related to the order in which it is implemented.
- There is no interdependence or logical sequence.
- WBS does not show anywhere that an WP can not, for example, to start if some others have not finished.
- The only dependence that exists in WBS is based on its hierarchical structure
- to complete an WP, all the activities that are linked to it must be completed.

Approaches in Developing a WBS
Top down and Bottom up

- The hierarchical structure ensures an orderly overview of necessary activities.
- There are two different approaches
  - Top-down approach
  - Bottom-up approach

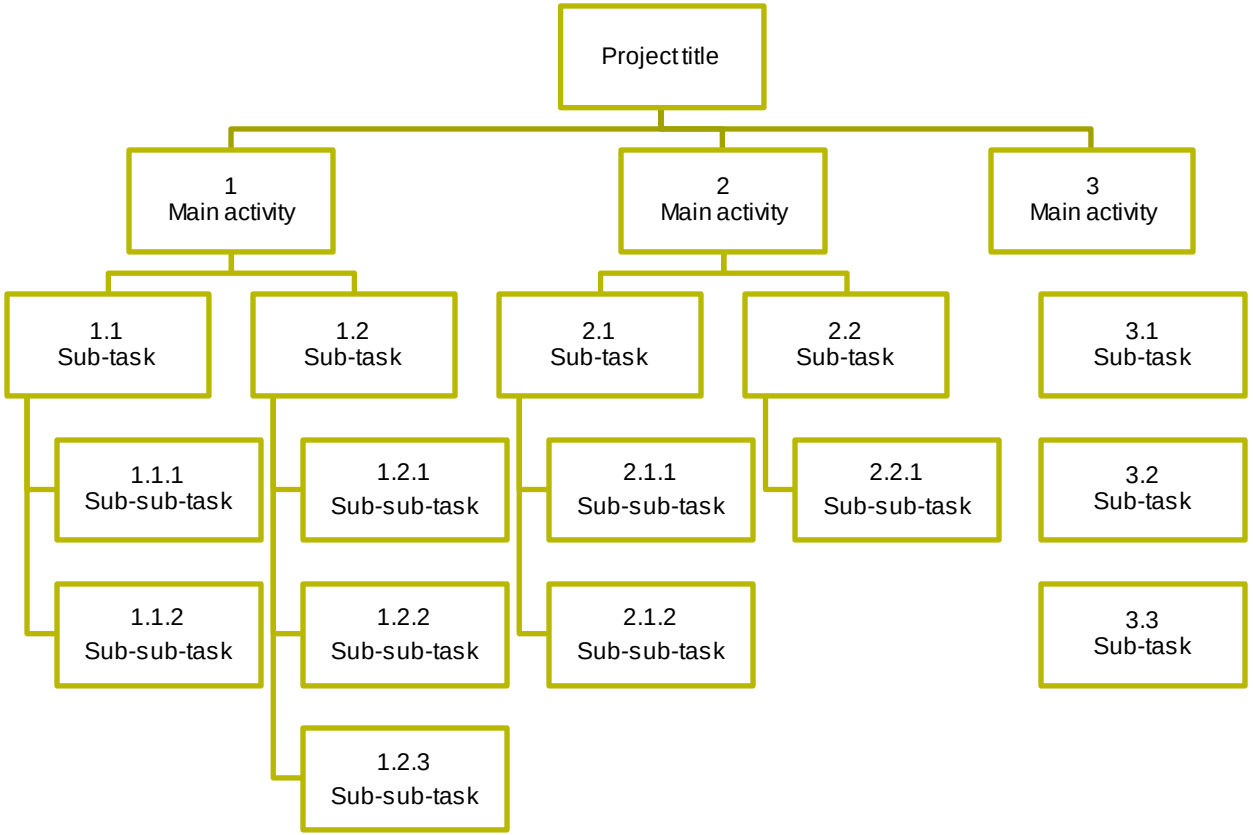
Top-down approach

- When we work with an already created project plan, the main activities are already known.
- By subdividing each main activity into detailed sub-activities and re-splitting them into smaller sub-activities (sub-sub activities), a hierarchical tree structure is created, which is typical for a WBS.
- The foundation starts at the top and branches down into smaller, sub-tasks.

Bottom-up approach

- If there is no clear project plan yet, it is also possible to start from the bottom and figure out what activities should be carried out.
- To discover that, it is good to brainstorm about it with all the stakeholder.
- After such a session, the activities that are related can be grouped together.
- This foundation can also lead to a hierarchical tree structure, that branches out upwards into various sub-activities.

WBS Template



For more information on this method, visit:
https://www.toolshero.com/project-management/work-breakdown-structure-wbs/

Open Tools

- WBS Tool is a free web software for building Project Work Breakdown Structures (WBS), WBS Charts, Organograms and other types of hierarchies.
- The Tool works with any web-browser with the adobe flash plugin installed.
- http://www.wbstool.com/

Q&A