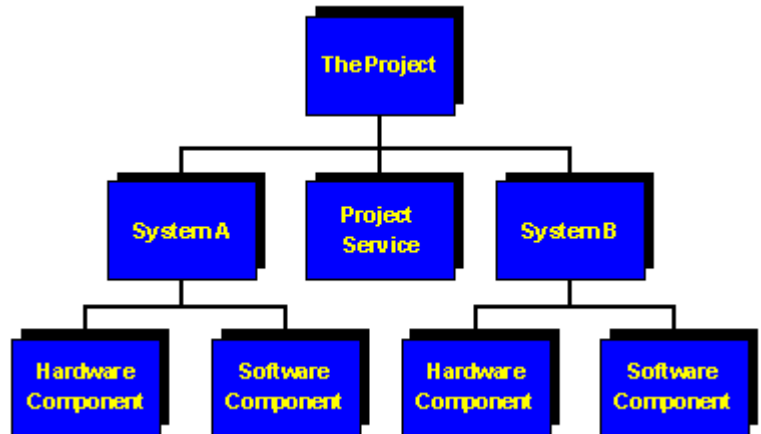


Work Breakdown Structures

The WBS is a deliverable-oriented hierarchical decomposition of the work to be executed by the project team, to accomplish the project objectives and create the required deliverables. The WBS should be structured in accordance with the way work will be performed and reflect the way in which project's cost and schedule data will be summarised and reported.

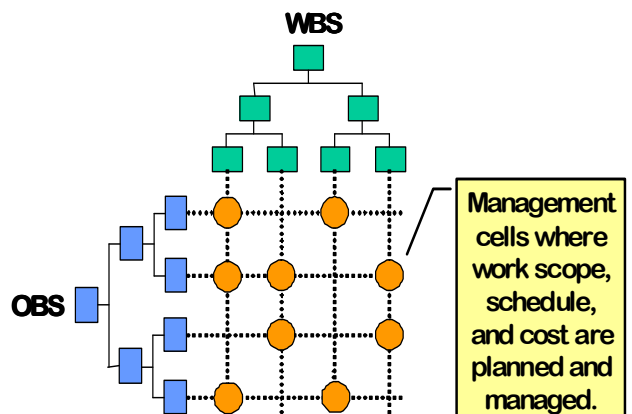


The most common structure for a WBS is a 4 to 6 level indented structure, where the first three are managerial levels describing (for example) the total project, the project phases and the control accounts. The lower level(s) are technical levels culminating in the work packages.

Where a component of work is to be outsourced to a separate contractor, the project's WBS stops at the control account or work package level that describes the contracted work. Lower level detail should be incorporated in a WBS maintained by the contractor.

WBS Nomenclature:

- **WBS element:** Any single component in the WBS diagram – the component can be at any level. Types of component include:
 - **Parent:** A higher level element in the WBS that is decomposed into two or more lower level elements (children)
 - **Child:** A lower level element in the WBS that is rolled up into a single higher level element (parent). Parent/Child descriptions are relative; an element can be both a parent of lower level elements and the child of a higher level element.
 - **Work Package:** the lowest level of any branch of the WBS. The work package is a defined section of project work that produces a deliverable (either a part of the product or something required for the management of the project such as a risk management plan). The work package is normally the point of integration for schedule, cost, quality and risk information.
 - **Control Account¹:** A management control point where the integration of scope, budget, actual cost, and schedule takes place, and where the measurement of performance will occur. Control accounts (CA) are placed at selected points (specific components at selected levels) of the WBS. Each CA may include one or more work packages, but each work package may be associated with only one CA. Each CA is associated with a specific organisational component (person) in the OBS.



¹ OBS = Organisational Breakdown Structure – the staff reporting relationships within the project. The intersection of WBS and OBS may be a control account or a work package. It defines the point of management responsibility for a deliverable or a series of deliverables.

- **Planning Package:** the lowest level of any branch of the WBS where that branch is expected to be decomposed into greater detail at a later date, generally when more information becomes available.
- **WBS dictionary:** A document that describes each component in the WBS. The WBS dictionary will generally include:
 - The code of accounts number (WBS number)
 - The description of the element
 - What is required to allow the work package to start
 - Exactly what will be done (referencing the specification, etc)
 - Who is responsible for performing the work (person or organisation, may be internal or external)
 - Who is responsible for managing the work (must be a manager working for the project manager)
 - What are the deliverables
 - Who will receive the deliverables
 - The estimated duration, resources and cost for the work package
 - How progress will be measured

Guidelines for developing a WBS:

A well designed WBS has the following characteristics:

- **Clear direction/definition:** Make sure the project initiation has been fully completed and the parameters of what's in and what's out of scope agreed before developing the WBS.
- **Completeness:** The WBS should describe all of the work needed to complete the whole project. And there shouldn't be anything in the WBS that isn't part of the project.
- **The 100% Rule:** Each level of the WBS should include 100% of the work of the project and only the work needed to complete the authorised scope. When documenting the lower level elements (children) underneath a WBS element (parent), the children must completely and exactly describe the same amount of work as the parent, just in more detail.
- **Appropriate level of detail:** Only develop the WBS to an appropriate level of detail—one that provides adequate information to plan and manage the project without creating excessive data.
- **The decomposition Rule:** Each element of the WBS decomposes into at least two 'children' (if no further decomposition is needed (or possible) do not go to the next level for this branch of the WBS). Each 'child' has only one parent (a WBS element must not be connected to 2 higher level elements).

Links to the Schedule²:

The activities in the project schedule follow the 100% rule. Each work package or planning package should decompose into one or more schedule activities. Planning packages are typically represented by a single summary activity (eg, Allowance for testing = 8 weeks); this summary activity will be replaced by more detailed activities once the full requirements of the work are defined³. Normal work packages typically expand into a significant number of activities and milestones that fully define the sequence and duration of the work needed to complete the package. The activities should define 100% of the effort needed to accomplish the work package. Each schedule activity should only roll up into a single WBS element.

² For more on scheduling see: http://www.mosaicprojects.com.au/PMP_Sup/PMP_Mod06_Time.html

³ See 'rolling wave planning': http://www.mosaicprojects.com.au/WhitePapers/WP1060_Rolling_Wave.pdf

Links to Earned Value Management⁴:

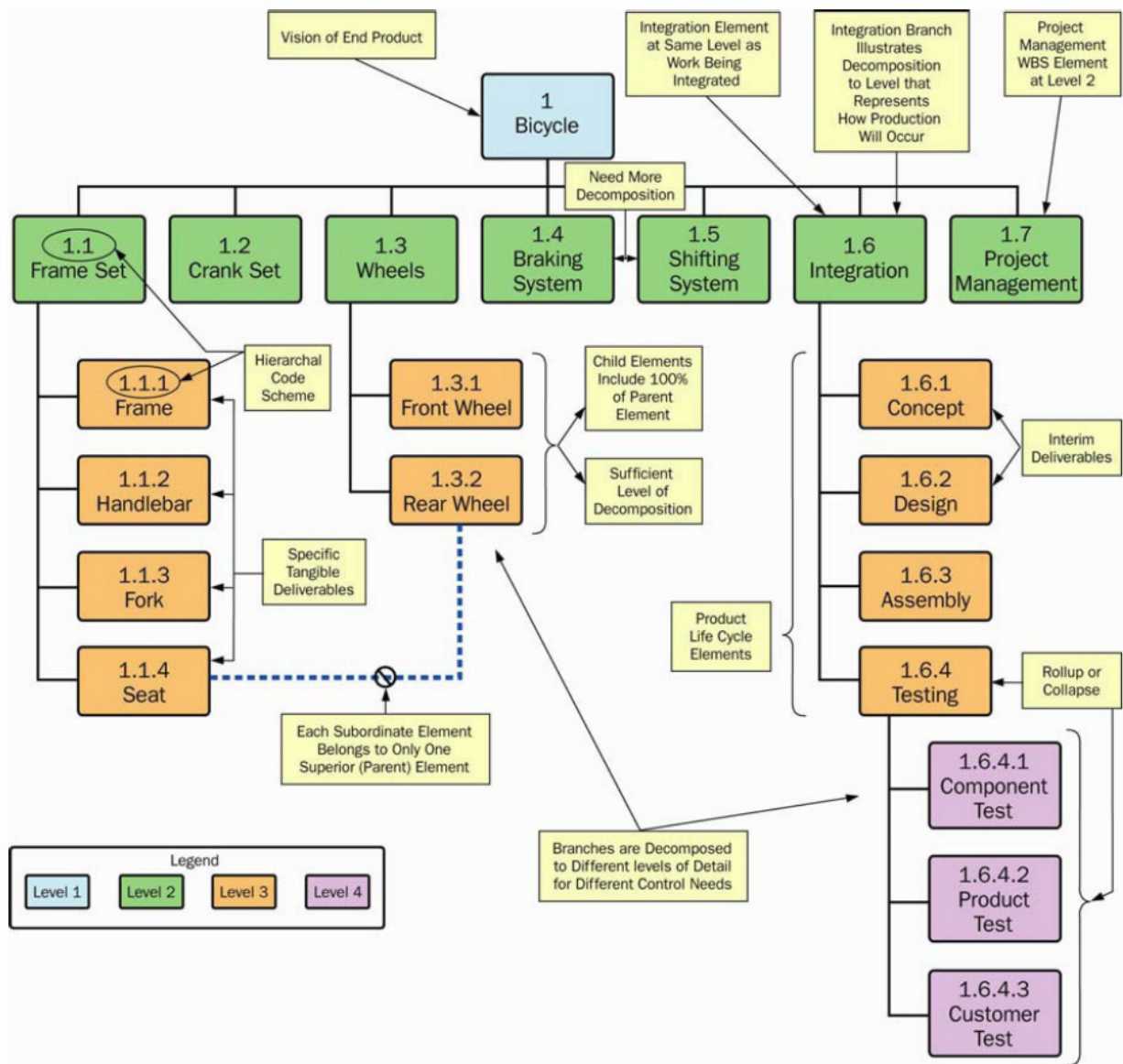
Most EV systems aggregate/integrate information at either the work package level or the control account level. This level of granularity balances the effort needed to identify and allocate actual cost data with the usefulness of the information provided. In most organisations accurately dividing and allocating actual costs to the schedule activity level is nearly impossible whereas rolling up schedule progress data to a work package is straightforward.

The Earned Value methodology involves more than just calculating formulae. Where a variance is identified, the responsible manager is expected to assess the reason and recommend recovery actions. This requires a single point of management responsibility for each work package and control account.

More information:

Practice Standard for Work Breakdown Structures 2nd Edition – www.pmi.org

(available as a free PDF download for members – Diagram below © PMI from the WBS Practice Standard)



⁴ For more on Earned Value see: http://www.mosaicprojects.com.au/PMP_Sup/PMP_Mod07_Cost.html#EV