

Complex work breakdown structures for engineering or drug development projects

How resource management software supports the cost estimating process

Complex engineering and drug development projects share the need for a multi-level work breakdown structure (WBS) to break down the scope into manageable chunks of work. This document describes how Innate's resource management software can be used to:

1. Restructure complex work breakdown structures to suit the requirements of a new project or program of work and
2. support the subsequent cost estimating and approval process

Engineering projects

When estimating the resource costs for complex engineering projects, the first step is to breakdown the scope of the project into manageable work packages for cost estimating. These are often known as CTRs (cost, time, resource). A Work breakdown structure (WBS) approach is used to position each work package within the overall project structure.

Complex projects can have a WBS of many levels, and templates based on previous experience are often used as the starting point. Before detailed cost estimates can be prepared for each work package the template WBS needs to be adapted to match the scope of work of the new project. This typically requires that various legs within the WBS need to be removed and new ones added, at the appropriate levels.

Once this structure has been agreed, details of the individual work packages can be distributed to the relevant centres of excellence within the organization, for preparation and submission of the individual CTR estimates. A final review and approval leads to its incorporation into the proposal for the client.

Pharmaceutical projects

Drug development or product enhancement projects in the pharmaceutical industry can also have complex work classification structures. For example, the consumer healthcare division of a major pharmaceutical company classifies their product brands by category and related sub-category, with individual projects related to each brand. Each project has a list of standard tasks and progress on individual tasks is tracked using stages, where Innate stores the dates that each stage is completed.

As new projects are planned they need to be correctly positioned in this program of work, and the levels beneath modified to reflect the scope of each new project. The overall structure will occasionally need modifying to reflect organizational changes.

This white paper describes how Innate’s resource management software is used to support this cost estimating process for complex work breakdown structures.

Using Resource Management software for restructuring the WBS

1. The first step is to create a WBS for the new project or program of work, using a WBS template as the starting point. The screenshot below shows a representative WBS template stored in Innate’s resource management software. It consists of the following levels:

1. Client
2. Program
3. Project
4. Phase
5. Module
6. Task
7. Skill
8. Resource

In this first screenshot we can see the structure collapsed to a single line for each Client, with the column titles indicating the levels in the WBS.

Client (1) ^	Program (2) ^	Project (3) ^	Phase (4) ^	Module (5) ^	Task (6) ^	Skill (7) ^	Resource (8) ^
ABC Co	(various)	(various)	(various)	(various)	(various)	(various)	(various)
Acme	BAU	(various)	(various)	(various)	(various)	(various)	(various)
Innate	Client Projects	New CRM system			Business case	ANALYST	Nat Nolan
Internal	BAU	Admin			Holidays	PROJECT DIRECTOR	Abigail
Total							
Unallocated							

2. By clicking on the + or – symbols to the left of the WBS elements, you can expand or collapse the WBS tree at the selected level in the structure. The screenshot below shows the effect of opening an item at levels 1 & 2, to show the relevant projects at level 3.

Client (1) ^	Program (2) ^	Project (3) ^	Phase (4) ^	Module (5) ^	Task (6) ^	Skill (7) ^	Resource (8) ^
ABC Co	BAU	Innate	(various)	(various)	(various)	(various)	(various)
ABC Co	Client Projects	Feasibility study for ABC Co			(various)	ANALYST	Nat Nolan
ABC Co	Client Projects	Project C			(various)	ANALYST	Kris King
ABC Co	Client Projects	Support invoicing system			System Upgrade	ANALYST	Kris King
ABC Co	Marketing	Project A			(various)	ANALYST	(various)
Acme	BAU	(various)	(various)	(various)	(various)	(various)	(various)
Innate	Client Projects	New CRM system			Business case	ANALYST	Nat Nolan
Internal	BAU	Admin			Holidays	PROJECT DIRECTOR	Abigail
Total							
Unallocated							

- To insert a new leg into the structure with the resource management software, you simply highlight the row and select the level at which you want the leg to start from the right hand menu options. For example you can select to **insert a new project** 'new project 3' into the Marketing program of Client ABC Co, as shown below. The lower entries to the right can then be completed, using text entry or from pick lists, which are configured as required.

Client (1) ^	Program (2) ^	Project (3) ^	Phase (4) ^	Module (5) ^	Task (6) ^	Skill (7) ^	Resource (8) ^
Availability							
ABC Co	BAU	Innate	(various)	(various)	(various)	(various)	(various)
ABC Co	Client Projects	Feasibility study for ABC Co			(various)	ANALYST	Nat Nolan
ABC Co	Client Projects	Project C			(various)	ANALYST	Kris King
ABC Co	Client Projects	Support invoicing system			System Upgrade	ANALYST	Kris King
ABC Co	Marketing	Project A			(various)	ANALYST	(various)
ABC Co	Marketing	New project 3	Phase 1 Phase 2 Phase 3 Phase 4				
Acme	BAU	(various)		(various)	(various)	(various)	(various)
Innate	Client Projects	New CRM system			Business case	ANALYST	Nat Nolan
Internal	BAU	Admin			Holidays	PROJECT DIRECTOR	Abigail
Total							
Unallocated							

- Legs of the structure to be removed need to be first displayed in full, by opening up the structure as previously shown to the required level and then deleting the relevant rows.

The resource management software now holds the modified structure and is ready for cost estimates to be prepared.

Cost estimating with resource management software

With the structure agreed, time phased cost estimates can be entered for each detailed row, i.e. the individual work packages. For complex structures, where different teams will be responsible for preparing the estimates, Innate permissions are used to control the rows that individual teams can access.

Estimates are entered in appropriate units of work, e.g. days per week or heads per months, etc. Cost rates are then applied to produce the cost estimates.

Each client's estimate review and approval process can easily be supported within the resource management software; as costs estimates are entered within the system, approvers are notified and changes in status made. It is easy to summarise estimates at all levels within the WBS.

If you are struggling with your cost estimating on complex work structures then contact Innate to see how our resource management software can help.