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How to Design a Proper Project Execution Cost Breakdown Structure

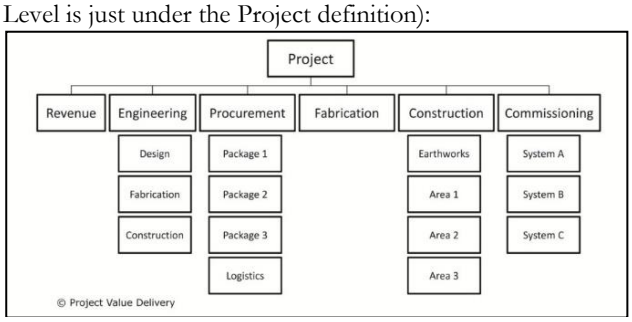
The effectiveness of Project Cost Control lies very much in the design and implementation of a proper Cost Breakdown Structure that is fit for purpose. In this paper we explain what the important characteristics of such a breakdown structure are, and how it should be implemented in projects.

What are the objectives of the Cost Breakdown Structure?

The Cost Breakdown Structure (CBS) defines the logical sub-division of work into manageable portions to facilitate planning, control and management of a project.
Completing the CBS for a project provides a task-oriented "family tree" of elements, which organises, defines and graphically displays the total work to be accomplished. The total work is defined in more detail as the structure is broken into more detail.
The highest levels of the CBS are often the same for all projects in a given organization as they generally cover all types of project expenses and income. This allows for comparisons and benchmarks to be produced between projects.
Each descending level of the CBS represents an increasingly detailed definition of the project. The lowest elements of each leg are where the project cost, time and scope is captured.

The design and thorough implementation of a proper Cost Breakdown structure is essential for proper Project Control

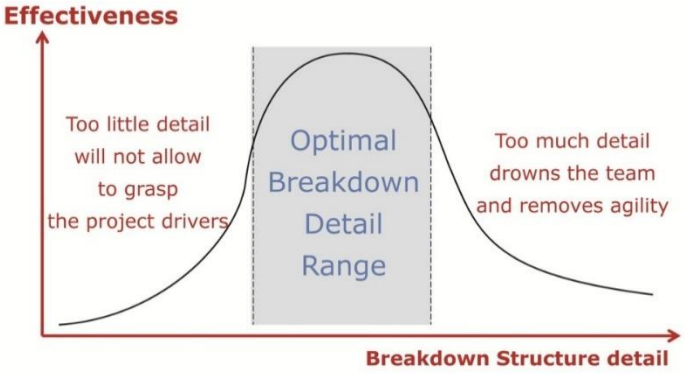
Here is a typical example of a Project Structure (for a single entity; if multiple entities on the project, the Entity Level is just under the Project definition):



More detail is not necessarily better

In terms of breakdown structure, there is a natural tendency to believe that more detail is better. In fact it is not true – in cost as in schedule, there is an ideal size of the breakdown structure beyond which the level of control actually diminishes because of the sheer amount of information and detail that needs to be updated and tracked. In addition the maintenance of the breakdown becomes so cumbersome that agility is lost (the ability to update the project control system to reflect changes due to unforeseen circumstances). Too much detail in the cost breakdown also takes up too much time for tracking and monthly reporting, hence losing focus on the main purpose of Cost Control, which is forecasting.

The ideal breakdown level is thus detailed enough, but not too detailed.



It is a matter of experience and judgment. The experienced controls professional will find the sweet spot between excessive detail and insufficient insight into the workings of the project cost. The rule should be to detail only as much as is needed to keep control of the Work Package (WP), and not more. Always remember that you can refine the breakdown further, or even change the breakdown during project execution if you need or if circumstances require (for future costs).
For example, the cost breakdown structure for internal engineering typically does not need to be as detailed as the set of CTRs used for engineering management (CTR stands for Cost-Time-Resource, it is the breakdown of work generally used for engineering work; it describes chunks of work with a specific scope, resources and budget). Data about man-hours may be captured for each CTR from the timesheet system, but from a project cost point of view a higher level of cost follow-up might be sufficient in the form of the follow-up of the engineers allocated to the project team.

Qualities of a Cost Breakdown Structure

The following issues need to be properly addressed by the chosen breakdown structure:

- Each Work Package (WP) should represent a discrete and definable task that can be clearly distinguished from all other work packages in a project,
- Each WP should have a scheduled start and finish date that represents its duration,

- Each WP should have a specific budget amount attached to it, and a Budget Owner responsible for this budget has to be identified,
- The duration for a typical Work Package should be relatively short, ideally, not more than two to six months (however that is not always possible; it should stick with the duration of any associated contract),
- The Work Packages need to align with the organization and have a unique, clear and accountable Budget Owner,
- A Purchase Order or a Contract should ideally not span over several Work Packages, or if it is the case or unavoidable (e.g. a contract covering both engineering, procurement and construction activities), the Purchase Order or Contract should explicitly split the costs, reporting and the invoicing to allow cost tracking by Work Package. This requires tight coordination between procurement and Cost Control. On the other hand, one WP can span over several contracts,
- Unique WP reference/ numbering (a WP is an elementary task which is used as a means of measuring performance),
- Reporting and follow-up requirements e.g. for different project packages,
- Client requirements, in particular for reimbursable or rate-based work,
- Legal entities: there must be separate WP for different legal entities,
- In-/Out-country: there must be separate WP for in- and out-country costs (tax consequences),
- Separate follow-up of specific costs that are early indicators for project management performance, e.g. airfreight costs within logistics; inspection costs, etc,
- Reporting: there must be separate WP for the organization's standard high-level reporting framework
- Allowances must be split out in separate Work Packages,
- One WP should generally refer to one type of cost and cost follow-up method.

In terms of breakdown structure, there is a natural tendency to believe that more detail is better. It is not true

There needs also to be a link to Estimating; at a high level, reconciliation with the estimating breakdown should be possible to allow feedback into the estimating process. However it needs to be clear that the Cost Control breakdown structure obeys to different drivers and that a project cannot be adequately controlled on the basis of an estimating breakdown.

The Cost Breakdown Structure must be implemented throughout the organization's systems

To allow the proper application of the Cost Control process, the CBS must be implemented in many different systems throughout the organization, at least as an additional field that will allow to produce relevant reports:

- Accounting tool (for invoice coding)
- Commitment tracking tools
  - Procurement tool
  - Time-sheet system (for personnel)
- Schedule (optional, can be partial only on those areas where Earned Value Management is relevant)

This implementation must be done at the start of the project, and in case of any update to the CBS (which can easily happen due to modifications to the project execution strategy), Cost Control should be accountable to check that this update is properly relayed to all other relevant systems in the organization.

Conclusion

The design and thorough implementation of a proper Cost Breakdown structure is essential when it comes to Project Cost Control. Contrary to what many think, more details is not necessarily better and the CBS must find the right compromise when it comes to its size and level of detail. It shall then be spread throughout the organization's systems to ensure a comprehensive and effective usage.

Find all these principles of Project Cost Control exposed in a comprehensive manner in our Handbook (2nd edition),
Practical Project Cost Control for Project Managers
(available in Paperback and Kindle versions!)
[all links to Amazon.com]