**Decomposition Technique**

Decomposition technique is used to estimate the project as presented in the previous section. After decomposing the entire project into a number of smaller tasks, we make project estimates. It is easier to handle smaller tasks than to handle a very larger project as a whole. So, the entire project (problem) is broken down into number of smaller tasks (problems) and then each smaller problem could be solved easily.

Decomposition technique is used as a technique or model for cost and project estimate. It is difficult to estimate the project as one task. Therefore, the project is decomposed into smaller tasks and each task is estimated individually and then the partial estimations of project tasks are added up for the whole project.

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A sound and formal estimate starts with a work breakdown structure (WBS). A WBS is a list of project major phases, deliverables, and work components (tasks) that will be built by the project that, when completed, will produce the final product. These work components/tasks can then be broken down into the activities that are required to build them.

The concept of this technique is to break down the work into smaller tasks. Each task can in turn be broken down further. This technique is very useful for the project development team and project management team to become familiar with the scope of the project, identifies work tasks, needed resources, and cost estimation. It also helps to monitor the project’s progress.

Project managers use the Work Breakdown Structure (WBS) to estimate projects and make complex projects more manageable.

Some advantages of using WBS include:

Assists with more accurate project estimation in cost, effort, resources, and schedule

Assists with project organization

Helps with assigning responsibilities to project development team members. A WBS that is correctly designed allows for the easy assignment of tasks to a specific element of the WBS, cutting down on confusion/duplication of assigned tasks.

Shows the control points and project milestones

Helps explain the project scope to customers and stakeholders

Assist in planning and control of the project

Tasks and Subtasks are related to each other in the sequence of project task networks. Project Task networks graphically visualize the tasks/sub-tasks and their relationships. Project Task networks are also known as activity networks.

The Work Breakdown Structure is a tree structure. The root of the tree is the whole project and the children of the root are the main tasks at first level of the tree which compose the project. At level 2 of the tree are the sub-tasks of the main tasks of the project at level 1. The rest levels of the tree are constructed similarly.

Using the tree structure of the WBS allows the determining of secondary costs for tasks, resources, etc., into their advanced level “parent” tasks, materials, etc.

The WBS is the basis for dividing work into defined tasks from which the, schedule, cost, and labor hour reporting can be established.

There are many ways to decompose a project into tasks. Different project break-down ways lead to different estimates. If the generated WBS is incorrect, then the project estimates are wrong and time is wasted in doing the estimates. The project can be broken down by feature, by project phase (requirements tasks, design tasks, programming tasks, QA tasks, etc.), or by some combination of the two.

WBS uses similar previous projects history and previous experience of projects that have been developed to generate project t estimates