# Project Management, Fairlay

This chapter is concerned with the planning, activity definition and estimation of effort and schedule including:

* Developing an architecture decomposition view (ADV) and allocating requirements to the elements of the ADV
* Developing a work breakdown structure (WBS) that includes work elements for the ADV modues and the allocated requirements for each element of work
* Developing work packages for the tasks in the WBS
* Defining a schedule of objectively measurable milestones
* Preparing a schedule network and indentifying the critical paths
* Preparing a PERT estimation of the project duration
* Identifying the numbers and kinds of resources needed, when they will be needed, and for how long
* Preparing an estimate of optimal effort, cost, schedule, and resources
* Negotiating with the customer to obtain a balance among requirements, cost, and product duration that satisfies the project constraints

The scope of each project varies so the activities of project management must be adapted to the needs of each project.

Rolling wave planning involves creating a high-level master plan with details for the coming month, subsequent month and three months, reviewing the plan monthly and adjusting it forward on a monthly basis. More details should be included in the plans closest to the current date. This type of planning allows resources to be available when needed, roadblocks to be cleared, work activities to be coordinated and risk factors identified and confronted early in the process.

Typical scenarios for developing a project plan include:

* Given—features desired, constraints and resources and the question “is this project feasible?”
* Given—features desired and the question “what is the estimate for the resources, budget and timing to complete the project?”
* Given—constraints such as time and budget and the question “what kind of product can we build?

Architectural design views (ADV) are concerned with specifying the software modules, their interrelationships, and their connections to the environment of the software. Different views document different relationships (structural, behavioral, functional). Requirements may be allocated to the leaf nodes of the ADV. Try to design an ADV that allows the product to be decomposed so that concurrent work tasks can be assigned to different teams. ADV are product modules—specified with nouns.

Work breakdown schedule (WBS) is concerned with partitioning the activities and tasks of a software project into manageable units with clearly defined roles, responsibilities, and authorities for each unit. It integrates technical and managerial activities. A task is the smallest unit of project planning, measurement, and control. Higher leaf nodes are activities. WBS structures are process-oriented hierarchical decompositions or work activities and tasks—specified with verb phrases.

Top level of WBS should encompass all work activities necessary to satisfy the requirements, constraints, and contractual commitments for the project. Each node should be decomposed into sublevels such that:

* Hidden complexities are exposed.
* Opportunities for reuse of existing software components can be identified.
* The necessary hardware resources can be specified.
* Estimates of effort needed to develop the software can be made.

Work packages are the specifications for tasks and activities in the WBS. The schedule network, resource requirements, cost estimates, and risk factors can be derived from work packages.

Acceptable options for reconciling schedule/resource conflicts include

* Reconfiguring the schedule network
* Extending the schedule so that fewer resources are needed in peak weeks,
* Adding more resources to maintain the schedule
* Using more productive resources so that fewer numbers are needed
* Descoping the requirements so that fewer resources and less time are needed

Unacceptable options for reconciling schedule/resource conflicts include

* Producing an unrealistic plan that has no chance of being successful implemented
* Planning for overtime
* Reducing or eliminating quality control tasks such as inspections, reviews and testing