



## Scheduling



When most people think about project planning and control, they usually think about scheduling. Once the project has been formalized, the work has been defined and organizational responsibilities identified, the scheduling process can take place. Those who have tried to schedule a project without going through the preliminary phases, especially the Work Breakdown Structure (WBS) development, may find themselves with an incomplete project plan. Scheduling activity is not a substitute for the WBS! The WBS forces recognition and definition of all of the effort involved in the project. Without a WBS, it is easy to ignore or overlook significant activities that must be accommodated in the overall project plan. The first step in the development of a schedule is to recognize all of the work that must be done. The WBS facilitates that process.

**At the conclusion of this lesson you will be able to recognize different scheduling techniques and their characteristics.**



## **Scheduling Techniques**

There are many different kinds of scheduling techniques, including milestone charts, Gantt charts, networks, line of balance, and combinations thereof. All have advantages and disadvantages depending on the type of project activity involved. Networking is often preferred for large, one-of-a-kind type projects, especially now that modern software and computer graphics have reduced the administrative burden associated with statusing and updating. Networking, however, is not suited to repetitive manufacturing processes; rather, line of balance or manufacturing flow schedules would be more appropriate. The simplicity and ease of use of milestone and Gantt charts makes them appealing to many managers, but these techniques do not easily accommodate the complexities associated with interdependencies among activities.

The scheduling system selected for any project should have certain characteristics and capabilities. There must be a "master" schedule that lays out the total scope of the project from beginning to end and that includes key milestones and decision points designated by management or directed by the customer. In a contractual situation, schedule targets, technical review points, delivery dates, and other significant milestones are negotiated or directed. For internal projects, company management establishes the schedule targets. Failure to do so results in an open-ended project that cannot be effectively base-lined and managed. Goal-setting is an essential part of project management and it is surprising how many times it is not properly done, particularly in the research and development or laboratory environment.



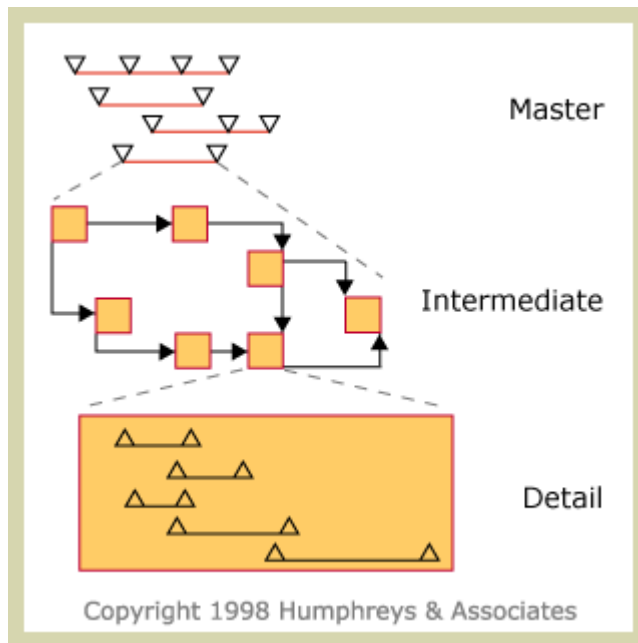
## **Master Schedule**

The master schedule is the summary-level schedule baseline for the project. It should be relatively static with changes resulting only from contractual modifications or deliberate management decisions. Updating and revising the project master schedule because of an inability to perform the work should not be permitted on a routine basis, although work-arounds to accommodate problems should be displayed.

Yet, many schedule practitioners allow such changes to occur and a firm schedule baseline is not maintained. Instead, the schedule is continually being redrawn every time performance is reported, causing the original baseline to be discarded and, in effect, preempting the schedule management process. The efficient software that facilitates schedule maintenance sometimes contributes to this problem if not properly implemented.



**Figure 4-1: Schedule Traceability**



Detail-level schedules are needed to manage the work, but there cannot be a disconnect between the detail-level schedules and the master schedule. There may also be a series of intermediate-level schedules that link the detail to the summary levels. This linkage from top to bottom is sometimes referred to as **vertical traceability**. The sequencing of activities from beginning to end of the project that recognizes interdependencies between tasks is referred to as **horizontal traceability**. Maintaining both is essential if the scheduling system is to be an effective management tool. **Figure 4-1** illustrates the concept of vertical traceability.

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### Long Description

Figure 4-1: This Schedule Traceability graph actually shows different graphs at three levels. The graph at the top represents the Master level schedule. This one is displayed as a Gantt chart. The lowest line in this Gantt chart is expanded below in a network chart and represents the Intermediate level schedule for that Master level activity. One of the task boxes in the Intermediate level network schedule is expanded below in another Gantt chart. This chart represents the detail level schedule for the one task in the Intermediate schedule. This demonstrates that from the bottom detail-level tasks there is traceability to a higher-level task.



## **Master Schedule and Control Accounts**

As mentioned earlier, the control account is a key management control point because responsibility for work accomplishment is established at that level. The control account is a defined element of work to be performed by a specific organizational entity. It will have a described scope of work, a schedule and a budget. The Control Account Manager (CAM) plans the detailed work tasks, manages their accomplishment and reports regularly to the project manager. The detail-level schedule often takes the form of a control account planning sheet since work packages and tasks must support control account work requirements, and because systems integration occurs at the control account level.

Schedule preparations may cause another iteration of the WBS resulting in the addition or deletion of WBS elements as viable work plans evolve. But once schedules are established for the control accounts, schedule data for higher level WBS or organizational elements can be derived by simply summarizing control account data. Thus, there is no need to develop specific schedules for each WBS or organization element and, if intermediate level schedules are developed, they do not need to equate to any specific WBS or organizational level. A logically developed WBS, however, tends to facilitate schedule development at certain levels to accommodate system, subsystem or component development, production or construction.



## Scheduling Knowledge Review

What are some examples of the different kinds of scheduling techniques and their characteristics?

- The only types of schedule techniques applicable to earned value management systems are Gantt charts, Networks, and Line-of-Balance techniques.
- The Master schedule - relatively static; Work-arounds - accommodate display of problems; Summary-level schedule - depicts the project baseline
- Master Schedule - lays out the total scope of the project; milestones - designate decision points; technical review schedules - contract targets.
- Gantt chart-simple and easy to use; Networks-large, complex, one-of-a-kind projects; Line of Balance, repetitive manufacturing functions

**Correct.** Gantt charts, Networks, and Line-of-Balance are all examples of different kinds of scheduling techniques.



### **End of Lesson**

You must click the **Next** button in order to receive credit for this lesson.