Project Scope & Schedule Management

Information Technology Project Management, Ninth Edition

Note: See the text itself for full citations

Agenda

- Scope Management
- Schedule Management

Scope Management

- Project scope management includes the processes, required to ensure all the work required to complete the project successfully.

- Managing project scope is an important part of project management.

Source:
PMBOK v6

Scope Key Concepts

- In the project context the term "scope" can refer to:

- Product scope: The features and functions of a product or service or result.

- Project scope: The work performed to deliver a product, service or result with the specified features and functions. The project scope include the product scope.
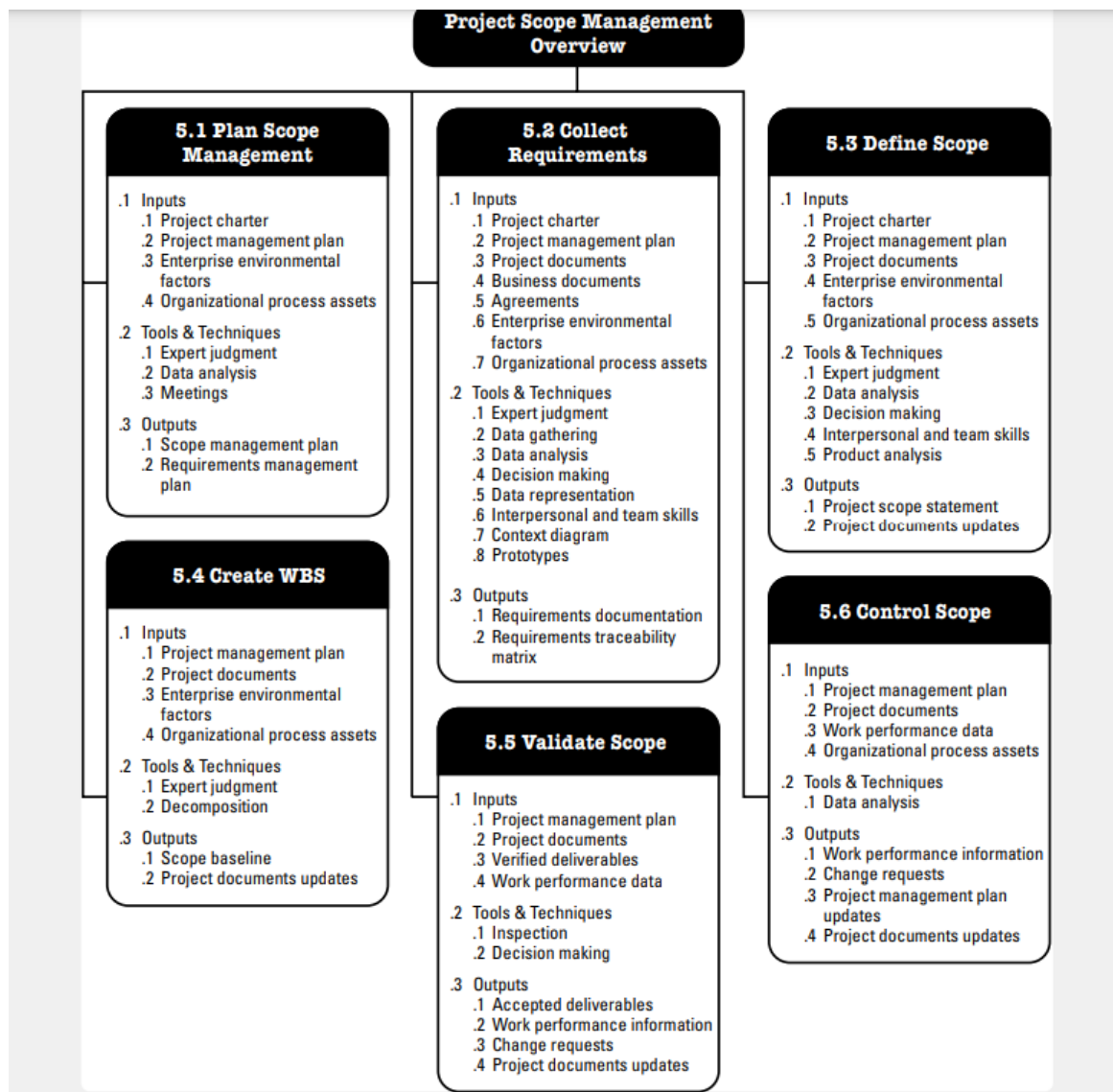
Source:
PMBOK v6

Scope Management Processes

- Plan project scope
- Collect requirements
- Define scope
- Create WBS
- Validate scope
- Control Scope

Source:
PMBOK v6

Scope Management Processes

Project Scope Management Overview

5.1 Plan Scope Management

.1 Inputs
  .1 Project charter
  .2 Project management plan
  .3 Enterprise environmental factors
  .4 Organizational process assets

.2 Tools & Techniques
  .1 Expert judgment
  .2 Data analysis
  .3 Meetings

.3 Outputs
  .1 Scope management plan
  .2 Requirements management plan

5.2 Collect Requirements

.1 Inputs
  .1 Project charter
  .2 Project management plan
  .3 Project documents
  .4 Business documents
  .5 Agreements
  .6 Enterprise environmental factors
  .7 Organizational process assets

.2 Tools & Techniques
  .1 Expert judgment
  .2 Data gathering
  .3 Data analysis
  .4 Decision making
  .5 Data representation
  .6 Interpersonal and team skills
  .7 Context diagram
  .8 Prototypes

.3 Outputs
  .1 Requirements documentation
  .2 Requirements traceability matrix

5.3 Define Scope

.1 Inputs
  .1 Project charter
  .2 Project management plan
  .3 Project documents
  .4 Enterprise environmental factors
  .5 Organizational process assets

.2 Tools & Techniques
  .1 Expert judgment
  .2 Data analysis
  .3 Decision making
  .4 Interpersonal and team skills
  .5 Product analysis

.3 Outputs
  .1 Project scope statement
  .2 Project documents updates

5.4 Create WBS

.1 Inputs
  .1 Project management plan
  .2 Project documents
  .3 Enterprise environmental factors
  .4 Organizational process assets

.2 Tools & Techniques
  .1 Expert judgment
  .2 Decomposition

.3 Outputs
  .1 Scope baseline
  .2 Project documents updates

5.5 Validate Scope

.1 Inputs
  .1 Project management plan
  .2 Project documents
  .3 Verified deliverables
  .4 Work performance data

.2 Tools & Techniques
  .1 Inspection
  .2 Decision making

.3 Outputs
  .1 Accepted deliverables
  .2 Work performance information
  .3 Change requests
  .4 Project documents updates

5.6 Control Scope

.1 Inputs
  .1 Project management plan
  .2 Project documents
  .3 Work performance data
  .4 Organizational process assets

.2 Tools & Techniques
  .1 Data analysis

.3 Outputs
  .1 Work performance information
  .2 Change requests
  .3 Project management plan updates
  .4 Project documents updates

Source: PMBOK v6

Plan Project Scope (1 of 2)

- Plan project scope
  - The process of creating a scope management plan that documents how the project and product scope will be defined validated and controlled

Source:
PMBOK v6

Plan Project Scope (2 of 2)

- Plan project scope
    - Main Input –Project Charter
    - Main tool- Expertise
    - Main output- Scope management plan

Source:
PMBOK v6

Collect Requirements (1 of 2)

- Collect requirements
  - The process of collecting and documenting stakeholder's needs and requirements to meet the project objectives.

Source:
PMBOK v6

Collect Requirements (2 of 2)

- Collect requirements
  - Main inputs – Scope management plan, project charter, business case
  - Main tools- Data gathering, Data analysis
  - Main output –Requirements dcumentation

Source:
PMBOK v6

Define Scope (1 of 2)

- Define scope
  - The process of defining a detailed description of what's involved in the product and project.

Define Scope (2 of 2)

- Define scope
    - Main inputs – Requirements documents, project charter
    - Main tools- Expert judgement, data analysis
    - Main output- Project scope statement

Source:
PMBOK v6

Create WBS (1 of 2)

- Create work breakdown structure
  - Breaking down the project deliverables into smaller components

Source:
PMBOK v6

Create WBS (2 of 2)

- Create work breakdown structure
    - Main Inputs- Requirements document, Scope statement
    - Main tools- Expert judgement
    - Main output- Scope baseline

Source:
PMBOK v6

Validate Scope (1 of 2)

- Validate Scope
  - A process to formalizing the acceptance of the completed work.

Source:
PMBOK v6

- Validate Scope
    - Main Inputs - Scope management plan, scope baseline
    - Main tool - Inspection
    - Main output- Accepted deliverables

Source:
PMBOK v6

Control Scope (1 of 2)

- Control Scope
    - The process of managing the product and project scope and changes to the scope.

Source:
PMBOK v6

Control Scope (2 of 2)

- Control Scope
  - Main Inputs - Scope management plan, requirements document, scope baseline
  - Main Tools - Variance analysis
  - Main Output - Work performance information

Source:
PMBOK v6

Project Schedule Management

- Managers often cite delivering projects on time as one of their biggest challenges
  - Time has the least amount of flexibility; it passes no matter what happens on a project

- Project time management processes
    - Planning schedule management
    - Defining activities
    - Sequencing activities
    - Estimating activity durations
    - Developing the schedule
    - Controlling the schedule
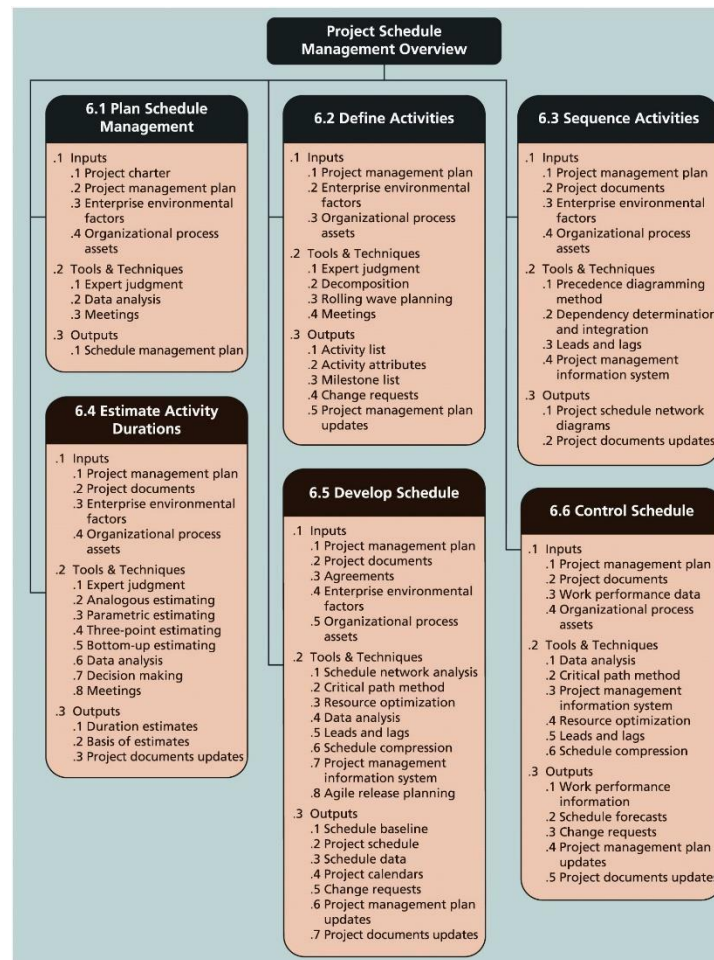
FIGURE 6-1   Project schedule management overview

Planning Schedule Management

- Elements of a schedule management plan
  - Project schedule model development
  - Scheduling methodology
  - Level of accuracy and units of measure
  - Control thresholds
  - Rules of performance measurement
  - Reporting formats
  - Process descriptions

Defining Activities (1 of 2)

- Defining activities involves identifying the specific actions that will produce the project deliverables in enough detail to determine resource and schedule estimates
    - Activity list: a tabulation of activities to be included on a project schedule
        - Activity name, activity identifier or number, and brief description of the activity
    - Activity attributes provide more information
        - Predecessors, successors, logical relationships, leads and lags, resource requirements, constraints, imposed dates, and assumptions related to the activity
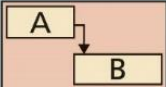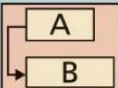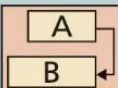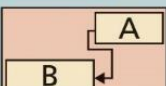
Defining Activities (2 of 2)

- A milestone is a significant event that normally has no duration
  - It often takes several activities and a lot of work to complete a milestone
  - They're useful tools for setting schedule goals and monitoring progress
    - Examples: obtaining customer sign-off on key documents or completion of specific products

- Sequencing process involves evaluating the reasons for dependencies and the different types of dependencies
  - A dependency or relationship is the sequencing of project activities or tasks
    - Mandatory dependencies: inherent in the nature of the work being performed on a project, sometimes referred to as hard logic
    - Discretionary dependencies: defined by the project team, sometimes referred to as soft logic. and should be used with care since they may limit later scheduling options
    - External dependencies: involve relationships between project and non-project activities

- Types of dependencies or relationships between activities
  - Finish-to-start
  - Start-to-start
  - Finish-to-finish
  - Start-to-finish

FIGURE 6-3 Task dependency types

- Network diagrams are the preferred technique for showing activity sequencing
  - Schematic display of the logical relationships among, or sequencing of, project activities

Estimating Activity Durations

- Duration includes the actual amount of time worked on an activity plus elapsed time
  - Effort is the number of workdays or work hours required to complete a task and does not normally equal duration
- People doing the work should help create estimates
  - An expert should review them
- A three-point estimate is an estimate that includes an optimistic, most likely, and pessimistic estimate
  - Three-point estimates are needed for PERT and Monte Carlo simulations

Developing the Schedule

- Uses results of the other time management processes to determine the start and end date of the project
  - Ultimate goal is to create a realistic project schedule that provides a basis for monitoring project progress for the time dimension of the project
- Important tools and techniques
  - Gantt charts
  - Critical path analysis

Gantt Charts (1 of 5)

- Provide a standard format for displaying project schedule information by listing project activities and corresponding start and finish dates in a calendar form
  - Symbols
    - Black diamond: milestones
    - Thick black bars: summary tasks
    - Light gray horizontal bars: durations of tasks
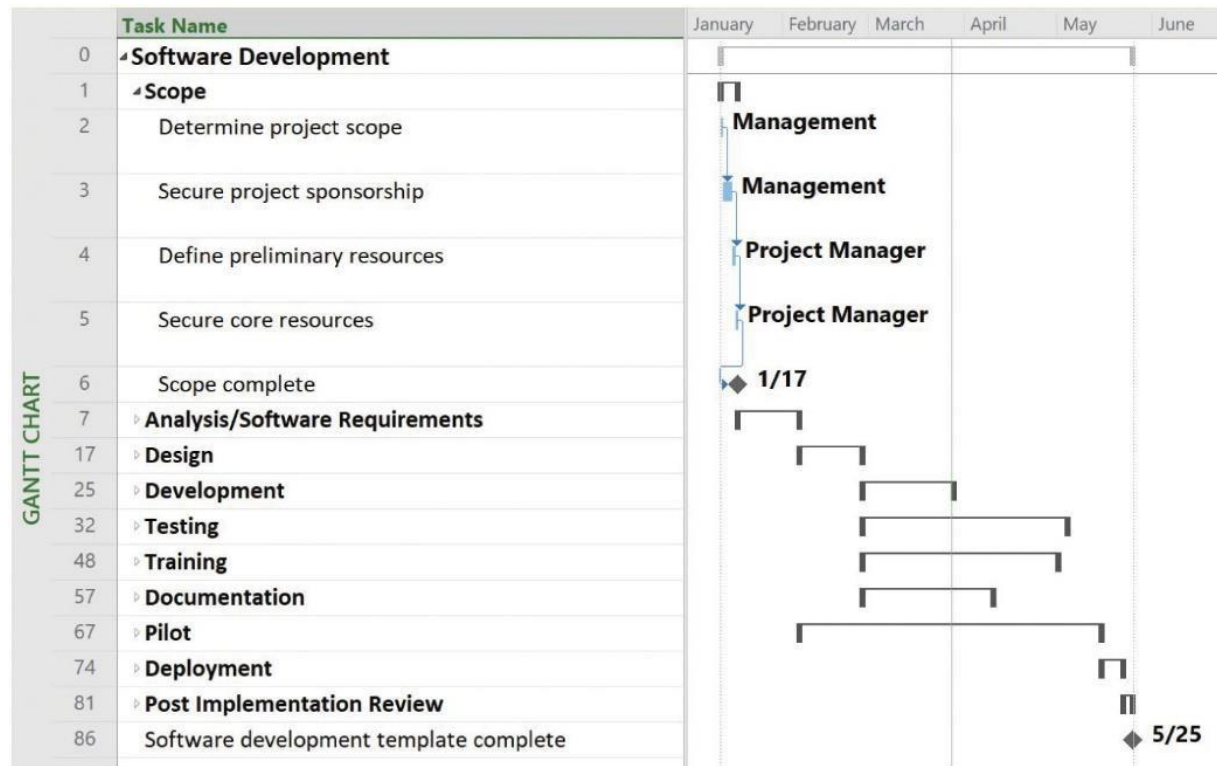   - Arrows: dependencies between tasks
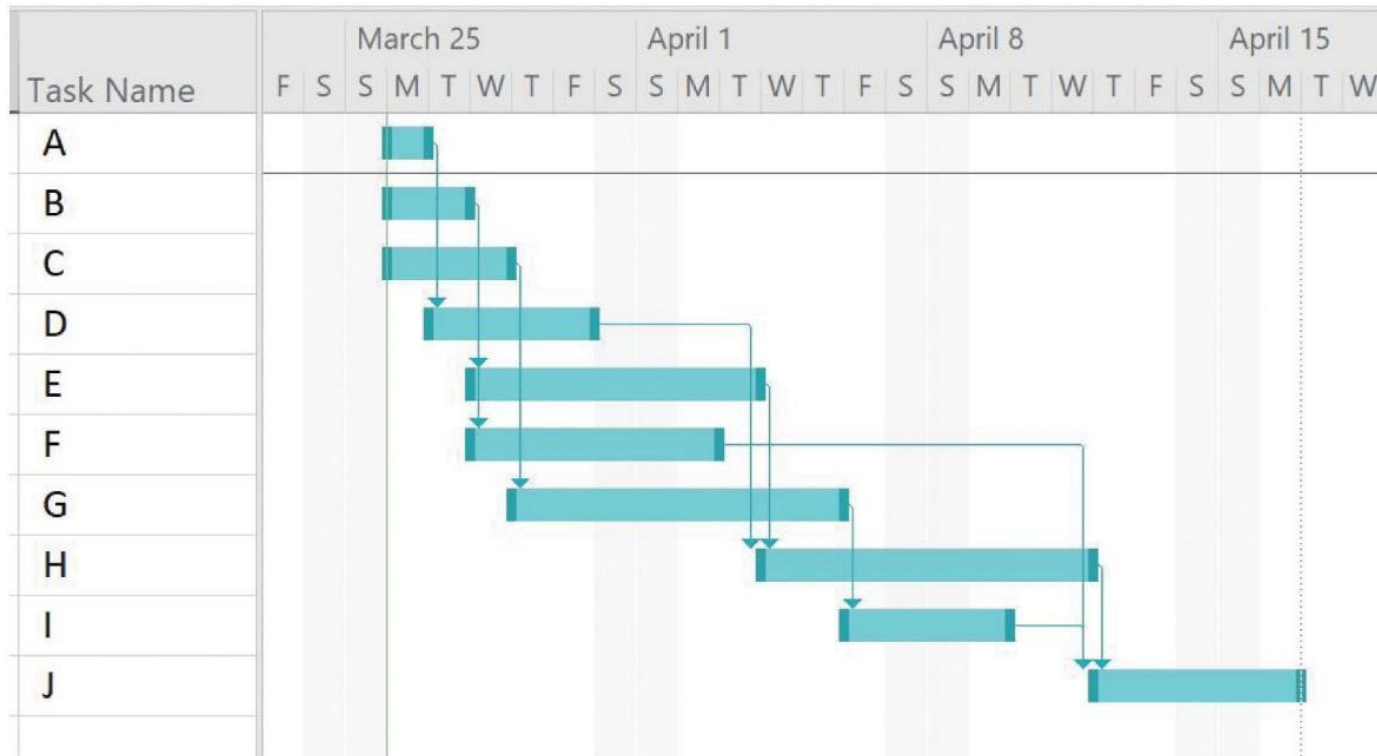
FIGURE 6-5 Gantt chart for project X
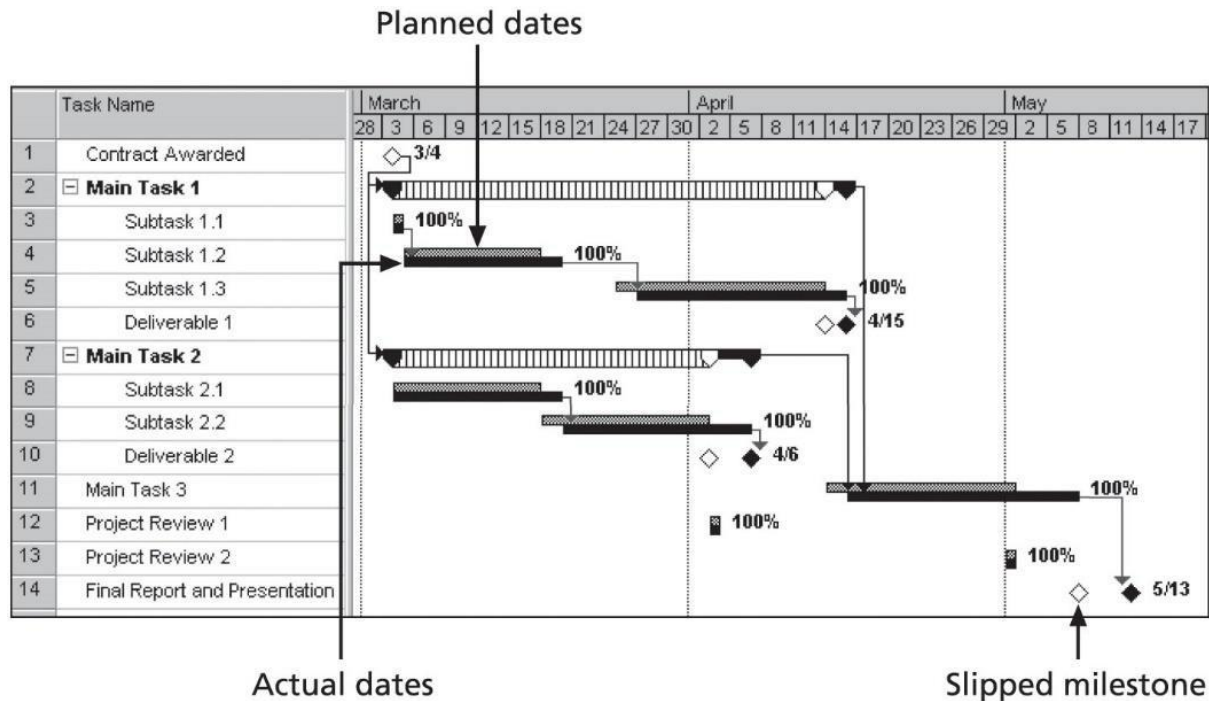
FIGURE 6-6 Gantt chart for software launch project

- Adding milestones to Gantt charts
  - Many people like to focus on meeting milestones, especially for large projects
    - Milestones emphasize important events or accomplishments on projects
- SMART Criteria for milestones
  - Specific
  - Measurable
  - Assignable
  - Realistic
  - Time-framed

Gantt Charts (5 of 5)

FIGURE 6-7 Sample tracking Gantt chart

Critical Path Method (CPM)

- Network diagramming technique used to predict total project duration
  - Critical path: series of activities that determine the earliest time by which the project can be completed
    - The longest path through the network diagram and has the least amount of slack or float; amount of time an activity may be delayed without delaying a succeeding activity or the project finish date
- Calculating the critical path
  - Develop a good network diagram and add the duration estimates for all activities on each path through the network diagram
    - Longest path is the critical path
  - If one or more of the activities on the critical path takes longer than planned, the whole project schedule will slip unless the project manager takes corrective action

Agile and Schedule Management

- Core values of the Manifesto for Agile Software Development
  - **Customer collaboration over contract negotiation**
  - Responding to change over following a plan
- Example: product owner defines and prioritizes the work to be done within a sprint
  - Collaboration and time management are designed into the process

Controlling the Schedule

- Goals of schedule control
  - Know the status of the schedule
  - Influence the factors that cause schedule changes
  - Determine that the schedule has changed
  - Manage changes when they occur
- Main inputs to schedule control
  - Project management plan
  - Project documents
  - Work performance data
  - Organizational process assets

Considerations for Agile/Adaptive Environments

- Schedule management is radically different using Agile and Scrum
    - Projects that rely heavily on the critical path method consider meeting the project's estimated completion date as a crucial component of success
    - Agile projects may not even need to estimate activity durations or project schedules at all; overall project completion time is not important

Chapter Summary

- Project time management is often cited as the main source of conflict on projects
    - Most IT projects exceed time estimates
- Main processes
    - Plan schedule management
    - Define activities
    - Sequence activities
    - Estimate activity resources
    - Estimate activity durations
    - Develop schedule
    - Control schedule