Chapter 1

Introduction to Project Management

What Is a Project?

- A **project** is “a temporary endeavor(effort) undertaken to create a unique product, service, or result” (PMBOK® Guide, Fifth Edition, 2013) *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*
- Projects end when their objectives have been reached or the project has been terminated.
- Projects can be large or small and take a short or long time to complete.

Examples of IT Projects

- A team of students creates a smartphone application and sells it online.
- A company develops a driverless car.
- A government group develops a systems to track child immunizations.
- A global bank acquires other financial institutions and needs to consolidate systems and procedures.
- A college upgrades its technology infrastructure to provide wireless Internet access across the whole campus.

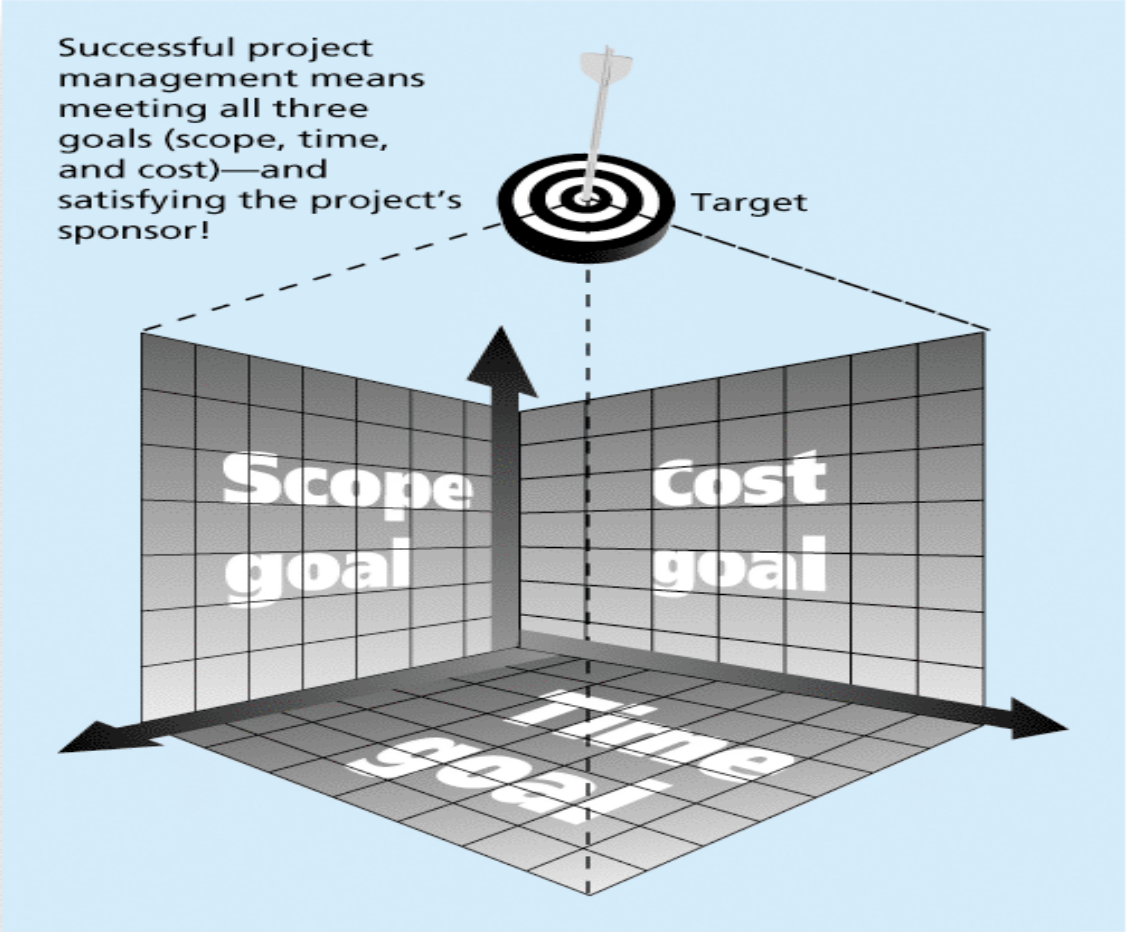
Project Attributes

- A project
  - has a unique purpose
  - is temporary
  - is developed using progressive elaboration
  - requires resources, often from various areas.
  - should have a primary customer or sponsor.
    - The **project sponsor** usually provides the direction and funding for the project.
  - involves uncertainty

Project and Program Managers

- **Project managers** work with project sponsors, project team, and other people involved in a project to meet project goals.
- **Program**: group of related projects managed in a coordinated way to obtain benefits .
- Program managers oversee programs; often act as bosses for project managers.

The Triple Constraint of Project Management



What is Project Management?

- **Project management** is “the application of knowledge, skills, tools and techniques to project activities to meet project requirements” (PMBOK® Guide, Fourth Edition, 2013)
- Project managers attempt to meet the **triple constraint** (project scope, time, and cost goals) and also facilitate the entire process to meet the needs and expectations of project stakeholders.

Project Stakeholders

- **Stakeholders** are the people involved in or affected by project activities.
- Stakeholders include
  - the project sponsor
  - the project manager
  - the project team
  - support staff
  - customers
  - users
  - suppliers

10 Project Management Knowledge Areas

- **Knowledge areas** describe the key competencies that project managers must develop.
- Project managers must have knowledge and skills in all 10 knowledge areas (project integration, scope, time, cost, quality, human resource, communications, risk, procurement, and stakeholder management)

Project Management Tools and Techniques

- **Project management tools and techniques** assist project managers and their teams in various aspects of project management
- Some specific ones include
  - Project charter, scope statement, and WBS (scope)
  - Gantt charts, network diagrams, critical path analysis, critical chain scheduling (time)
  - Cost estimates and earned value management (cost)

Project Success

- There are several ways to define project success:-
  - The project met scope, time, and cost goals
  - The project satisfied the customer/sponsor.
  - The results of the project met its main objective, such as making or saving a certain amount of money, providing a good return on investment, or simply making the sponsors happy.

What Helps Projects Succeed?*

1. Executive support
2. User involvement
3. Clear business objectives
4. Emotional maturity
5. Optimizing scope
6. Agile process
7. Project management expertise
8. Skilled resources
9. Execution
10. Tools and infrastructure

*The Standish Group, "CHAOS Manifesto 2013: Think Big, Act Small" (2013).

The Role of the Project Manager

- Planning, scheduling, coordinating, and working with people to achieve project goals.
- Remember that 97% of successful projects were led by experienced project managers.

Suggested Skills for Project Managers

- The Project Management Body of Knowledge.
- Application area knowledge, standards, and regulations.
- Project environment knowledge.
- General management knowledge and skills.
- Soft skills or human relations skills.

Ten Most Important Skills and Competencies for Project Managers

1. People skills
2. Leadership
3. Listening
4. Integrity, ethical behavior, consistent
5. Strong at building trust
6. Verbal communication
7. Strong at building teams
8. Conflict resolution, conflict management
9. problem solving
10. Understands, balances priorities

Different Skills Needed in Different Situations

- **Large projects:** Leadership, relevant prior experience, planning, people skills, verbal communication, and team-building skills were most important.
- **High uncertainty projects**: Risk management, expectation management, leadership, people skills, and planning skills were most important
- **Very novel projects:** Leadership, people skills, having vision and goals, self confidence, expectations management, and listening skills were most important

Thank You!

CHAPTER 2

Project Scope Management

What is Project Scope Management?

- **Scope** refers to *all* the work involved in creating the products of the project and the processes used to create them
- A **deliverable** is a product produced as part of a project, such as hardware or software, planning documents, or meeting minutes
- **Project scope management** includes the processes involved **in defining and controlling what is or is not included in a project**

Project Scope Management Processes

- **Collecting requirements: defining and documenting**

  stakeholders' needs to meet the project objectives.

- **Defining scope:** The process of developing a detailed description of the project and product.

- **Creating the WBS:** subdividing the major project deliverables into smaller, more manageable components
- **Verifying scope:** formalizing acceptance of the completed project deliverables
- **Controlling scope:** controlling changes to project scope throughout the life of the project

Collecting Requirements

- A **requirement** is "a condition or capability that must be met or possessed by a system, product, service, result, or component to satisfy a contract, standard, specification, or other formal document"
- For some IT projects, it is helpful to divide requirements development into categories called elicitation, analysis, specification, and validation
- It is important to use an iterative approach to defining requirements since they are often unclear early in a project

Methods for Collecting Requirements

- Interviewing
- Focus groups and facilitated workshops
- Using group creativity and decision-making techniques
- Questionnaires and surveys
- Observation
- Prototyping
- Software tools

Defining Scope

- Key inputs for preparing the project scope statement include the project charter, requirements documentation, and organizational process assets such as policies and procedures related to scope statements as well as project files and lessons learned from previous, similar projects
- As time progresses, the scope of a project should become more clear and specific

Creating the Work Breakdown Structure (WBS)

- A **WBS** is a deliverable-oriented grouping of the work involved in a project that defines the total scope of the project
- **Decomposition** is subdividing project deliverables into smaller pieces
- A **work package** is a task at the lowest level of the WBS.

Verifying Scope

- It is very difficult to create a good scope statement and WBS for a project
- It is even more difficult to verify project scope and minimize scope changes
- **Scope verification:** focuses on formal acceptance of the completed project scope by the stakeholders.
- **Quality control:** concerned with correctness of the deliverables and meeting the quality requirements specified for the deliverables.

Controlling Scope

- **Scope control involves controlling changes to the project scope**
- **Goals of scope control are to:**
  - Influence the factors that cause scope changes
  - Assure changes are processed according to procedures developed as part of integrated change control
  - Manage changes when they occur

Chapter Summary

- ***Project scope management***
  includes the processes required to ensure that the project addresses all the work required, and only the work required, to complete the project successfully
- ***Main processes include:***
  - Collect requirements
  - Define scope
  - Create WBS
  - Verify scope
  - Control scope

Project Time management

Importance of Project Schedules

- Delivering projects on time is one of their biggest challenges.
- Time has the least amount of flexibility; it passes no matter what happens on a project.
- Schedule issues are the main reason for conflicts on projects.

Project Time Management Processes

- **Defining activities**: identifying the specific activities that the project team members and stakeholders must perform to produce the project deliverables
- **Sequencing activities**: identifying and documenting the relationships between project activities
- **Estimating activity resources**: estimating how many **resources** a project team should use to perform project activities.

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- **Estimating activity durations**: estimating the number of work periods that are needed to complete individual activities.
- **Developing the schedule**: analyzing activity sequences, activity resource estimates, and activity duration estimates to create the project schedule.
- **Controlling the schedule**: controlling and managing changes to the project schedule

Defining Activities

- An **activity** or **task** is an element of work normally found on the work breakdown structure (WBS) that has an expected duration, a cost, and resource requirements.
- Activity definition involves developing a more detailed WBS and supporting to understand all the work to be done. so you can develop realistic cost and duration estimates.

Sequencing Activities

- Involves reviewing activities and determining dependencies
- A **dependency** or **relationship** is the sequencing of project activities or tasks.
- You *must* determine dependencies in order to use critical path analysis.

Estimating Activity Resources

- Before estimating activity durations, you must have a good idea of the quantity and type of resources that will be assigned to each activity; resources are people, equipment, and materials.
- Consider important issues in estimating resources
  - Are the required resources available?

Activity Duration Estimating

- **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
- Effort does not normally equal duration
- People doing the work should help create estimates, and an expert should review them

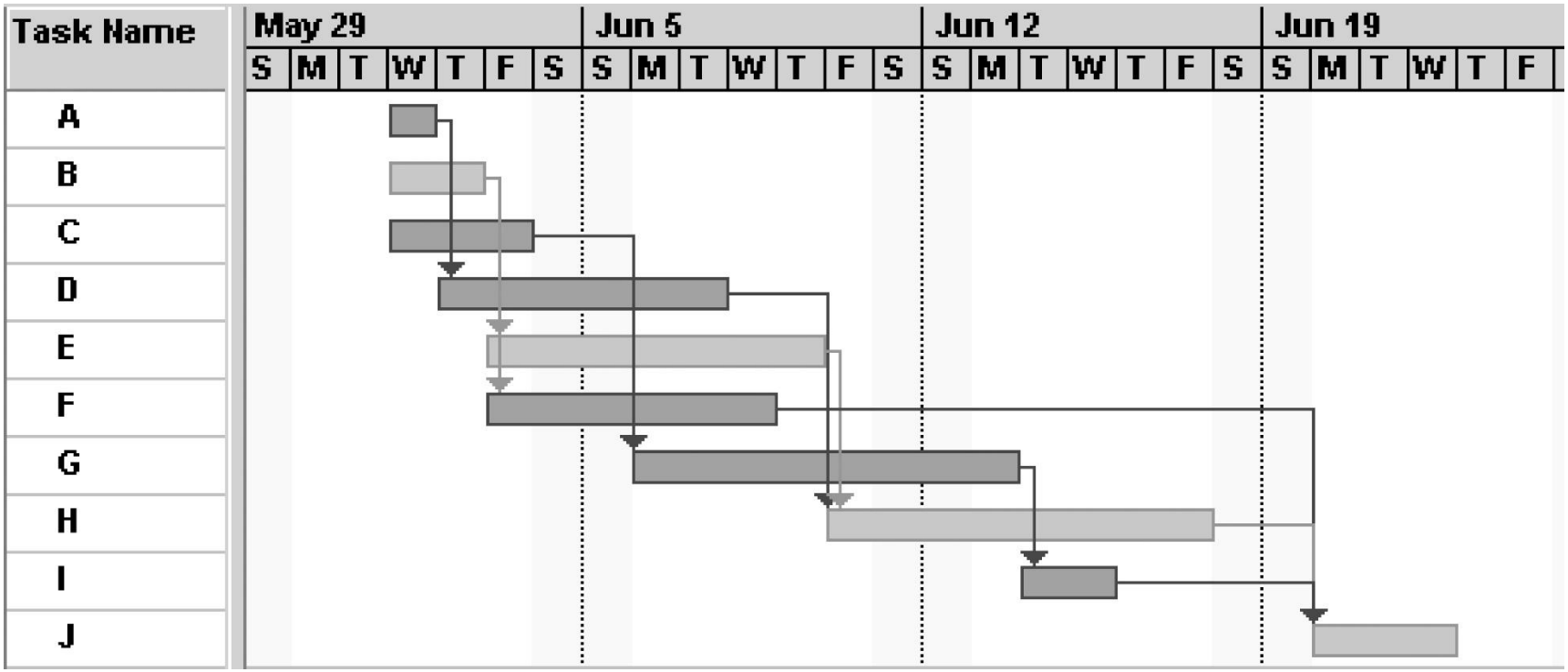
Developing the Schedule

- 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 include Gantt charts, critical path analysis, and critical chain scheduling

Gantt Charts

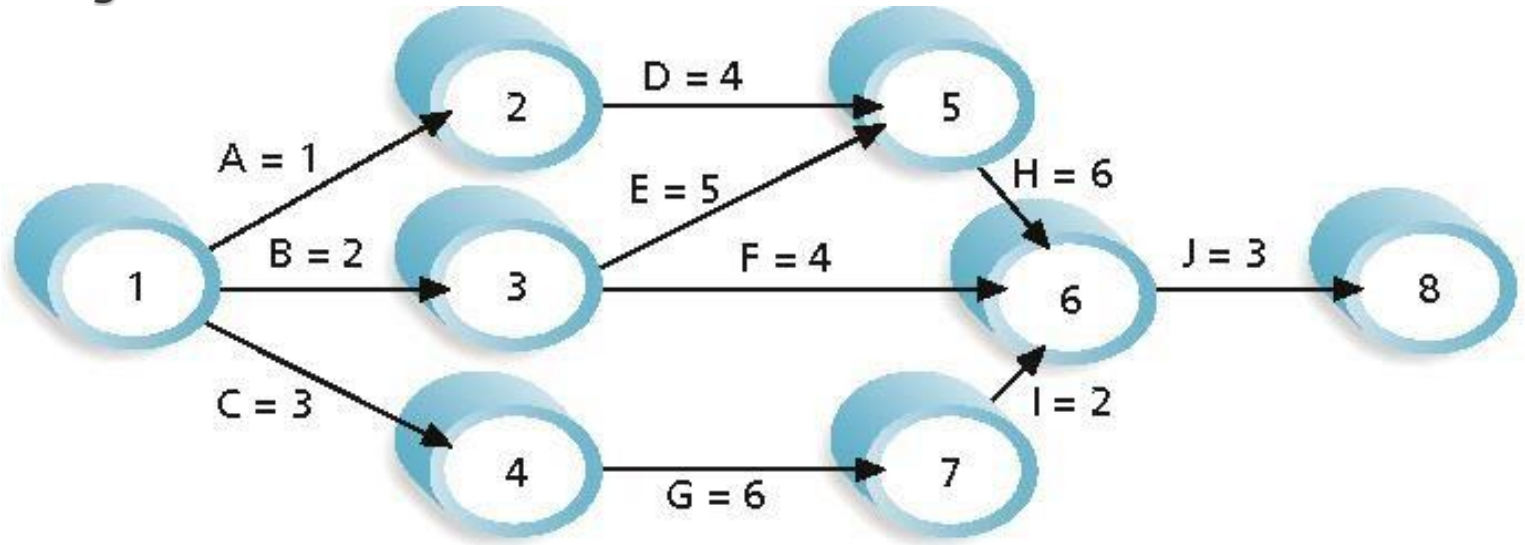
- **Gantt charts** provide a standard format for displaying project schedule information by listing project activities and their corresponding start and finish dates in a calendar format
- The **critical path** is the *longest path* through the network diagram and has the least amount of slack(delay) or float

Figure 6-5. Gantt Chart for Project X



Note: Darker bars would be red in Project 2007 to represent critical tasks.

Figure 6. Determining the Critical Path for Project X



Note: Assume all durations are in days.

Path 1:	A-D-H-J	Length = 1+4+6+3 = 14 days
Path 2:	B-E-H-J	Length = 2+5+6+3 = 16 days
Path 3:	B-F-J	Length = 2+4+3 = 9 days
Path 4:	C-G-I-J	Length = 3+6+2+3 = 14 days

Since the critical path is the longest path through the network diagram, Path 2, B-E-H-J, is the critical path for Project X.

Schedule Control Suggestions

- Perform reality checks on schedules
- Allow for contingencies
- Don’t plan for everyone to work at 100% capacity all the time
- Hold progress meetings with stakeholders and be clear and honest in communicating schedule issues

Controlling the Schedule

- **Goals are to know the status of the schedule, influence factors that cause schedule changes, determine that the schedule has changed, and manage changes when they occur**
- **Tools and techniques include:**
  - Progress reports
  - A schedule change control system
  - Project management software, including schedule comparison charts like the tracking Gantt chart
  - Variance analysis, such as analyzing float or slack
  - Performance management, such as earned value

Chapter Summary

- **Project time management is often cited as the main source of conflict on projects, and most IT projects exceed time estimates**
- **Main processes include:**
  - Define activities
  - Sequence activities
  - Estimate activity resources
  - Estimate activity durations
  - Develop schedule
  - Control schedule