

Project Management for Engineers - ENGR 5410G

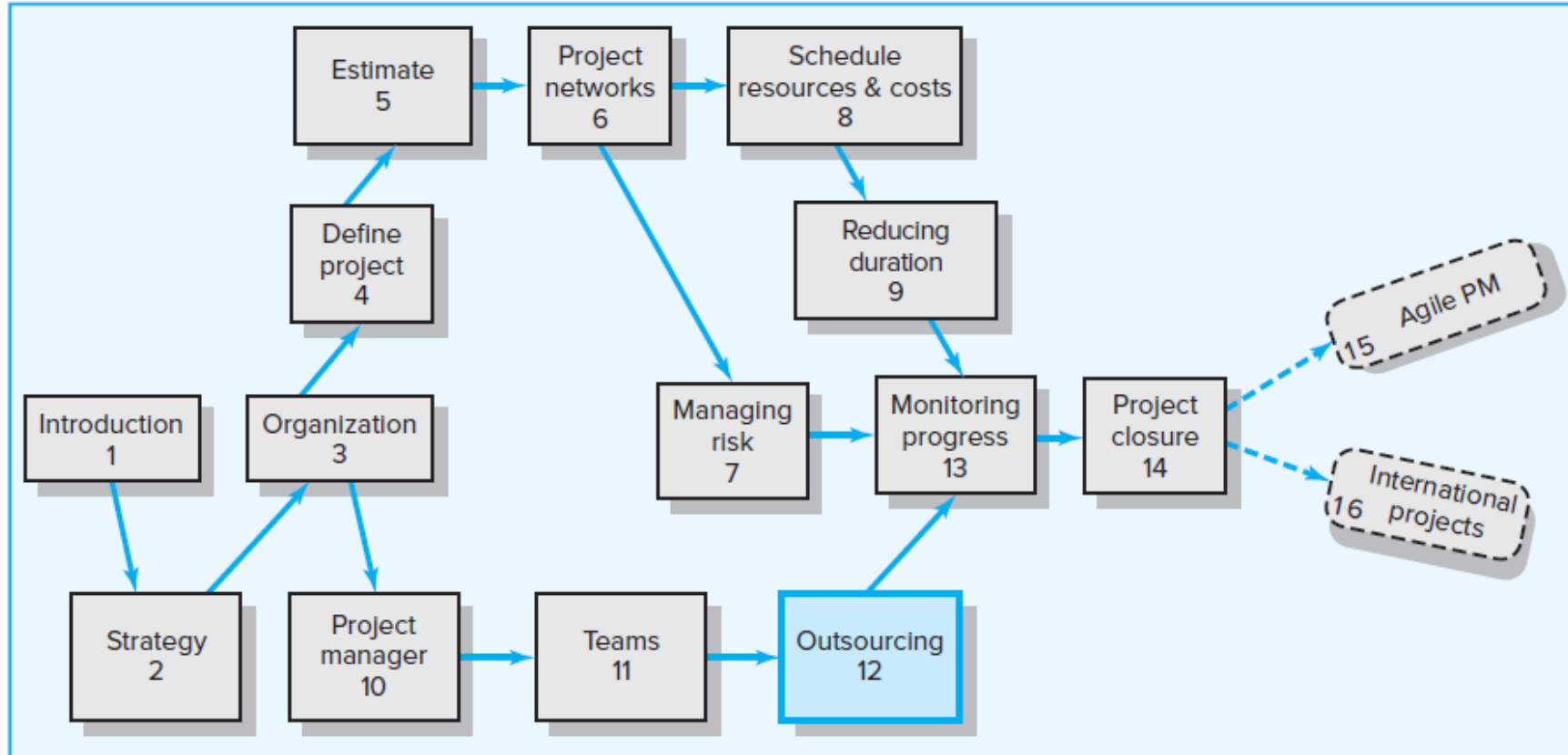
Fall 2024



Unit 9: Outsourcing (ch 12) & Agile (15)



Where We Are Now





Learning Objectives

- 12-01 Understand the advantages and disadvantages of outsourcing project work.
- 12-02 Describe the basic elements of a Request for Proposal (RFP).
- 12-03 Identify best practices for outsourcing project work.
- 12-04 Practice principled negotiation.
- 12-05 Describe the met-expectations model of customer satisfaction and its implications for working with customers on projects.



Chapter Outline

- 12.1 Outsourcing Project Work
- 12.2 Request for Proposal (RFP)
- 12.3 Best Practices in Outsourcing Project Work
- 12.4 The Art of Negotiating
- 12.5 A Note on Managing Customer Relations

12.1 Outsourcing Project Work

Outsourcing

- Has traditionally been applied to the transferring of business functions or processes (e.g., customer support, IT, accounting) to other foreign companies.
- Is now being applied to contracting significant chunks of project work.
 - Apple and Motorola work closely with manufacturers in China to develop next-generation smartphones.
 - Toyota and DaimlerChrysler collaborate with suppliers to develop new automobile platforms.

Reclining Chair Project



Advantages and Disadvantages of Outsourcing Project Work

Advantages

1. Cost reduction
2. Faster project completion
3. High level of expertise
4. Flexibility

Disadvantages

1. Coordination breakdown
2. Loss of control
3. Conflict
4. Security issues
5. Political hot potato



12.2 Request for Proposal (RFP)

Steps of Development of a Detailed RFP

1. Summary of needs and request for action
2. Statement of work (SOW) detailing the scope and major deliverables
3. Deliverable specifications/requirements, features, and tasks
4. Responsibilities—vendor and customer
5. Project schedule
6. Costs and payment schedule
7. Type of contract
8. Experience and staffing
9. Evaluation criteria



Contractor Evaluation Template

Contractor Evaluation Template	Maximum Weight	Proposal 1	Proposal 2	Proposal 3	Proposal 4
Contractor qualifications	Weight = 10				
Technical skills available	Weight = 20				
Understanding of contract and conditions	Weight = 5				
Financial strength to implement project	Weight = 15				
Understanding of proposal specifications	Weight = 10				
Innovativeness and originality of proposal	Weight = 5				
Reputation for delivering on time and budget	Weight = 15				
Price	Weight = 20				
Total	100				



12.3 Best Practices in Outsourcing Project Work

- Well-defined requirements and procedures
- Extensive training and team-building activities
- Well-established conflict management processes in place
- Frequent review and status updates
- Co-location when needed
- Fair and incentive-laden contracts
- Long-term outsourcing relationships

Key Differences between Partnering and Traditional Approaches to Managing Contracted Relationships

Partnering Approach

Mutual trust forms the basis for strong working relationships.

Shared goals and objectives ensure common direction.

Joint project team exists with high level of interaction.

Open communications avoid misdirection and bolster effective working relationships.

Long-term commitment provides the opportunity to attain continuous improvement.

Objective critique is geared to candid assessment of performance.

Access to each other's organization resources is available.

Total company involvement requires commitment from CEO to team members.

Integration of administrative systems equipment takes place.

Risk is shared jointly among the partners, which encourages innovation and continuous improvement.

Traditional Approach

Suspicion and distrust; each party is wary of the motives for actions by the other.

Each party's goals and objectives, although similar, are geared to what is best for that party.

Independent project teams; teams are spatially separated with managed interactions.

Communications are structured and guarded.

Single project contracting is normal.

Objectivity is limited due to fear of reprisal and lack of continuous improvement opportunity.

Access is limited with structured procedures and self-preservation taking priority over total optimization.

Involvement is normally limited to project-level personnel.

Duplication and/or translation takes place with attendant costs and delays.

Risk is transferred to the other party.



Four Strategies for Communicating with Outsourcers

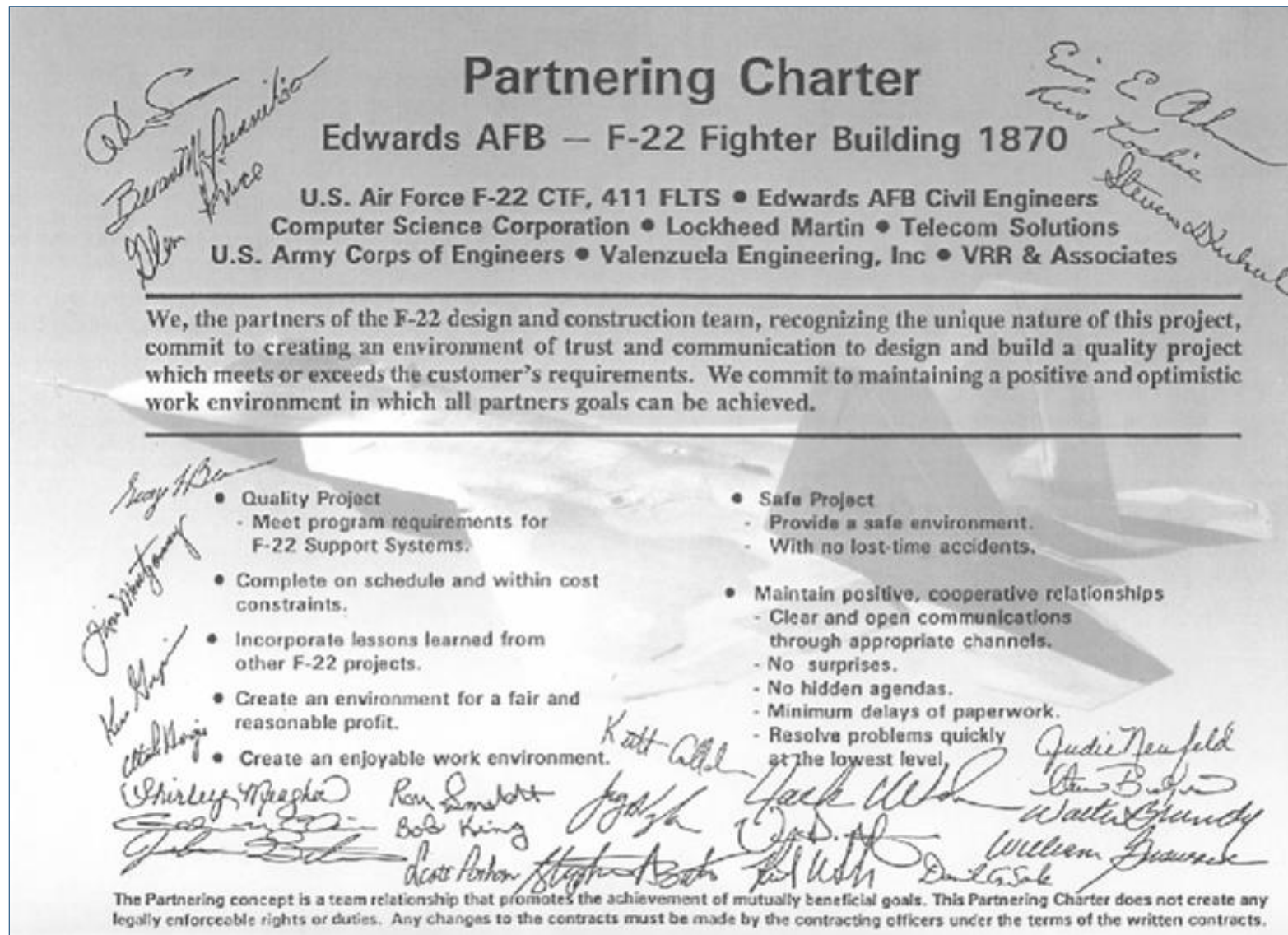
Strategy 1: Recognize culture differences

Strategy 2: Choose the right words

Strategy 3: Confirm your requirements

Strategy 4: Set deadlines

Project Partnering Charter



Sample Online Survey

Evaluation of partnering process: attitudes, teamwork, process.
(Collected separately from owner and contractor participants, compared, and aggregated.)

1. Communications between the owner/contractor personnel are				
1	2	3	4	5
Difficult, guarded				Easy, open, up front
2. Top management support of partnering process is				
1	2	3	4	5
Not evident or inconsistent				Obvious and consistent
3. Problems, issues, or concerns are				
1	2	3	4	5
Ignored				Attacked promptly
4. Cooperation between owner and contractor personnel is				
1	2	3	4	5
Cool, detached, unresponsive, removed				Genuine, unreserved, complete
5. Responses to problems, issues, or concerns frequently become				
1	2	3	4	5
Personal issues				Treated as project problems





Advantages of a Long-Term Partnership

- Reduced administrative costs
- More efficient utilization of resources
- Improved communication
- Improved innovation
- Improved performance

12.4 The Art of Negotiating

Principled negotiation

- Is an approach to negotiating championed by Fisher and Ury from the Harvard Negotiation Project.
- Emphasizes developing win/win solutions while protecting yourself against those who would take advantages of your forthrightness.
- Is based on four key points.
 - Separate the people from the problem
 - Focus on interests, not positions
 - Invent options for mutual gains
 - When possible, use objective criteria

Dealing with Unreasonable People

Fisher and Ury recommend that you use jiu-jitsu when dealing with such a person. That is

- When the other person begins to push, don't push back.
- Ask questions instead of making statements.
- Invite criticism and advice instead of defending your ideas.
- Use silence as a response to an unreasonable proposal.
- Have a strong **best alternative to a negotiated agreement (BATNA)**. A strong BATNA gives you the power to walk away and say, "No deal unless we work toward a win/win scenario."

12.5 A Note on Managing Customer Relations

- Bad news travel faster and farther than good news.
- Project managers need to cultivate positive working relations with clients to preserve their reputations.
- Customer satisfaction is a function of the extent to which perceived performance (or outcome) exceeds expectations.
- The met-expectation model of customer satisfaction highlights the point that whether a client is dissatisfied or delighted with a project is not based on hard facts and objective data but on perceptions and expectations.
- Project managers must be skilled at managing customer expectations and perceptions.

The Met-Expectations Model of Customer Satisfaction

$$\begin{array}{c} 0.90 \\ \text{Dissatisfied} \end{array} = \frac{\text{Perceived performance}}{\text{Expected performance}} = \begin{array}{c} 1.10 \\ \text{Very satisfied} \end{array}$$

- If performance falls short of expectations (ratio < 1), the customer is dissatisfied.
- If the performance matches expectations (ratio = 1), the customer is satisfied.
- If the performance exceeds expectations (ratio > 1), the customer is very satisfied or even delighted.

Managing Customer Expectations

- Avoid the temptation to oversell the virtues of a project to win approval.
- Lower customer expectations by underselling projects.
- Work closely with the client organization to develop a well-defined project scope statement.
- Share significant risks or potential problems that might disrupt project execution.
- Keep customers abreast of project progress.
- Handle customer interactions, unexpected problems and setbacks with a competent and professional manner.
- Speak with one voice.
- Speak the language of the customer.

Project Roles, Challenges, and Strategies

Project Manager Roles	Challenges	Strategies
Entrepreneur	Navigate unfamiliar surroundings	Use persuasion to influence others
Politician	Understand two diverse cultures (parent and client organization)	Align with the powerful individuals
Friend	Determine the important relationships to build and sustain outside the team itself	Identify common interests and experiences to bridge a friendship with the client
Marketer	Understand the strategic objectives of the client organization	Align new ideas/proposals with the strategic objectives of the client organization
Coach	Motivate client team members without formal authority	Provide challenging tasks to build the skills of the team members



Appendix 12.1

Contract Management



Procurement Management Process

- Planning purchases and acquisitions
- Planning contracting
- Requesting seller responses
- Selecting sellers
- Administering the contract
- Closing the contract



Contract

- Is a formal agreement between two parties wherein one party (the contractor) obligates itself to perform a service and the other party (the client) obligates itself to do something in return, usually in the form of a payment to the contractor.
- Is a codification of the private law, which governs the relationship between the parties to it.
- Defines the responsibilities.
- Spells out the conditions of its operations.
- Defines the rights the parties have in relationship to each other.
- Grants remedies to a party if the other party breaches its obligations.



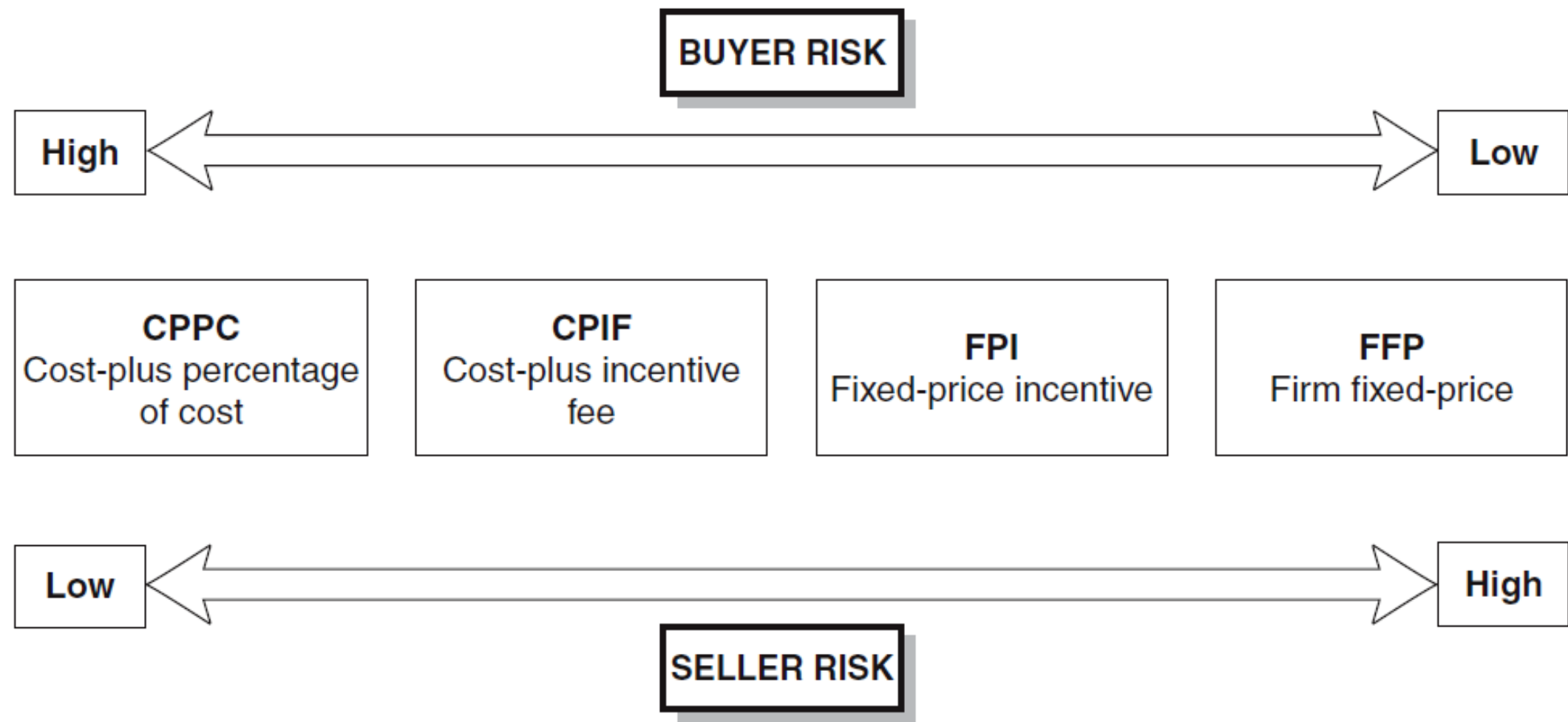
Fixed-Price Contracts

- The contractor agrees to perform all work specified in the contract at a fixed price.
- Fixed-price contracts are preferred by both owners and contractors when the scope of the project is well defined with predictable costs and low implementation risks.
- The disadvantage of a fixed-price contract for owners is that it is more difficult and more costly to prepare.
- The primary disadvantages of a fixed-price contract for contractors is that they run the risk of underestimating.
- Contracts with long lead times such as construction and production projects may include escalation provisions that protect the contractor against external cost increases in materials, labor rates, or overhead expenses.

Cost-Plus Contracts

- The contractor is reimbursed for all direct allowable costs (materials, labor, travel) plus an additional fee to cover overhead and profit.
- Unlike fixed-price contracts, cost-plus contracts put the burden of risk on the client. The contract does not indicate what the project is going to cost until the end of the project.
- The inherent weakness of cost-plus contracts has been compensated for by a variety of incentive clauses directed at providing incentives to contractors to control costs, maintain performance, and avoid schedule overruns.

Contract Type versus Risk





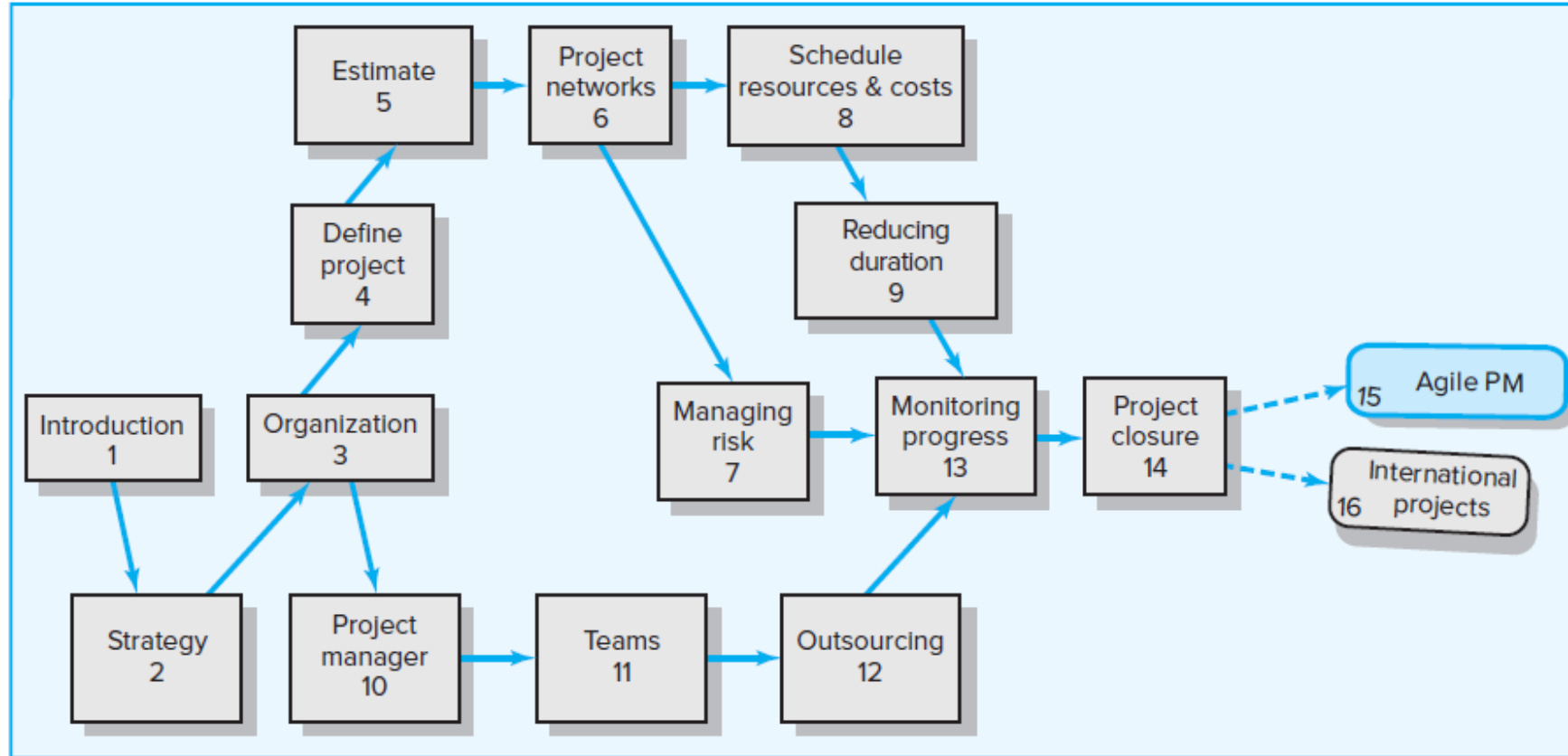
Contract Change Control System

- Defines the process by which the contract may be modified.
- Includes
 - the paperwork
 - tracking systems
 - dispute resolution procedures
 - approval levels necessary for authorizing changes



Agile Project Management

Where We Are Now





Learning Objectives

- 15-01 Recognize the conditions in which traditional project management versus Agile Project Management should be used.
- 15-02 Understand the value of iterative, incremental development for creating new products.
- 15-03 Identify core Agile principles.
- 15-04 Understand the basic methodology used in Scrum.
- 15-05 Understand the basic methodology used by Extreme programming.
- 15-06 Know how to create and use a Kanban board.
- 15-07 Recognize the limitations of Agile Project Management.



Chapter Outline

- 15.1 Traditional versus Agile Methods
- 15.2 Agile PM
- 15.3 Agile PM in Action: Scrum
- 15.4 Extreme Programming and Kanban
- 15.5 Applying Agile PM to Large Projects
- 15.6 Limitations and Concerns
- 15.7 Hybrid Models

15.1 Traditional versus Agile Methods

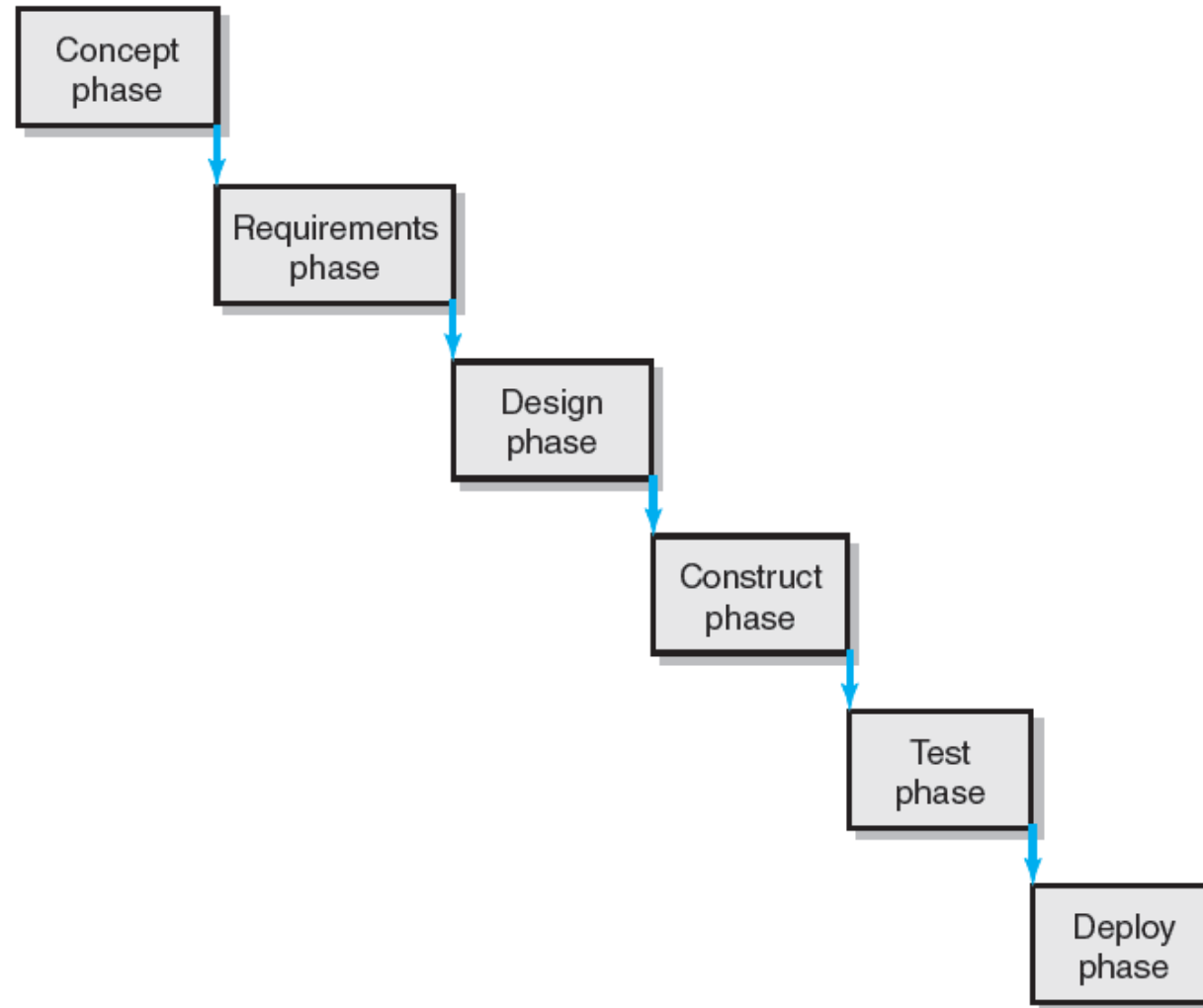
Traditional Project Management Approach

- Concentrates on thorough, up front planning of the entire project.
- Requires a high degree of predictability to be effective.

Agile Project Management (Agile PM)

- Relies on iterative, incremental development (IID).
- Is ideal for exploratory projects in which requirements need to be discovered and new technology tested.
- Focuses on active collaboration between the project team and customers representatives, breaking projects into small, functional pieces and adapting to changing requirements.

The Waterfall Approach to Software Development





A Set of 12 Guiding Principles for Agile PM

1. Our highest priority is to **satisfy the customer** through early and continuous delivery of valuable software.
2. Welcome **changing requirements**, even late in development.
3. Deliver **working software** frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
4. **Business people and developers** must work together daily throughout the project.
5. Build projects around **motivated individuals**. Give them the environment and support they need and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is **face-to-face conversation**.
7. **Working software** is the primary measure of progress.
8. Agile processes promote **sustainable development**.
9. **Continuous** attention to technical **excellence** and good design enhances agility.
10. **Simplicity**—the art of maximizing the amount of work not done—is essential.
11. The best architectures, requirements, and designs emerge from **self-organizing teams**.
12. At regular intervals, **the team reflects** on how to become more effective, then turns and adjusts its behavior accordingly.

Project Uncertainty

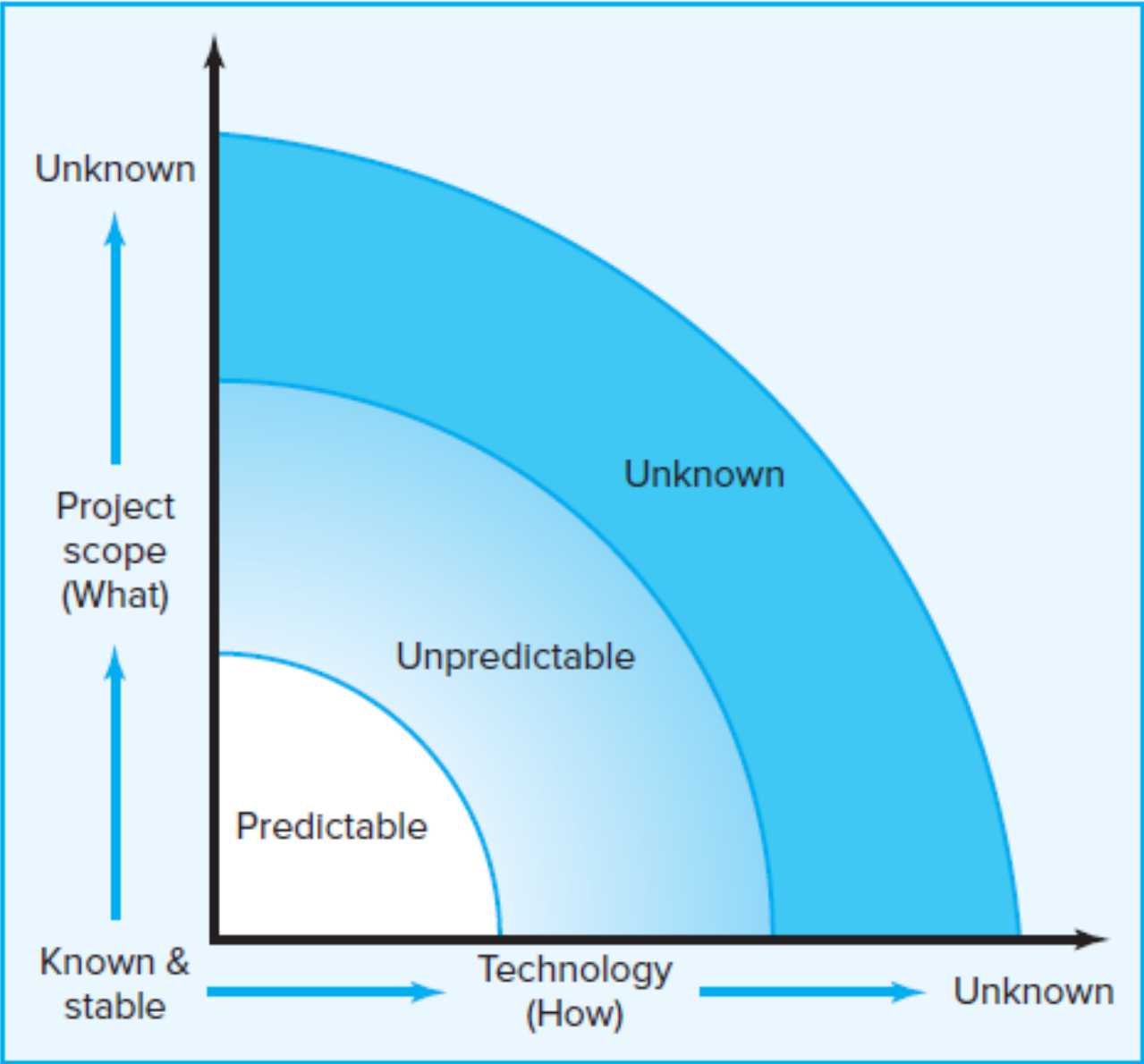


FIGURE 15.2

Traditional Project Management versus Agile Project Management

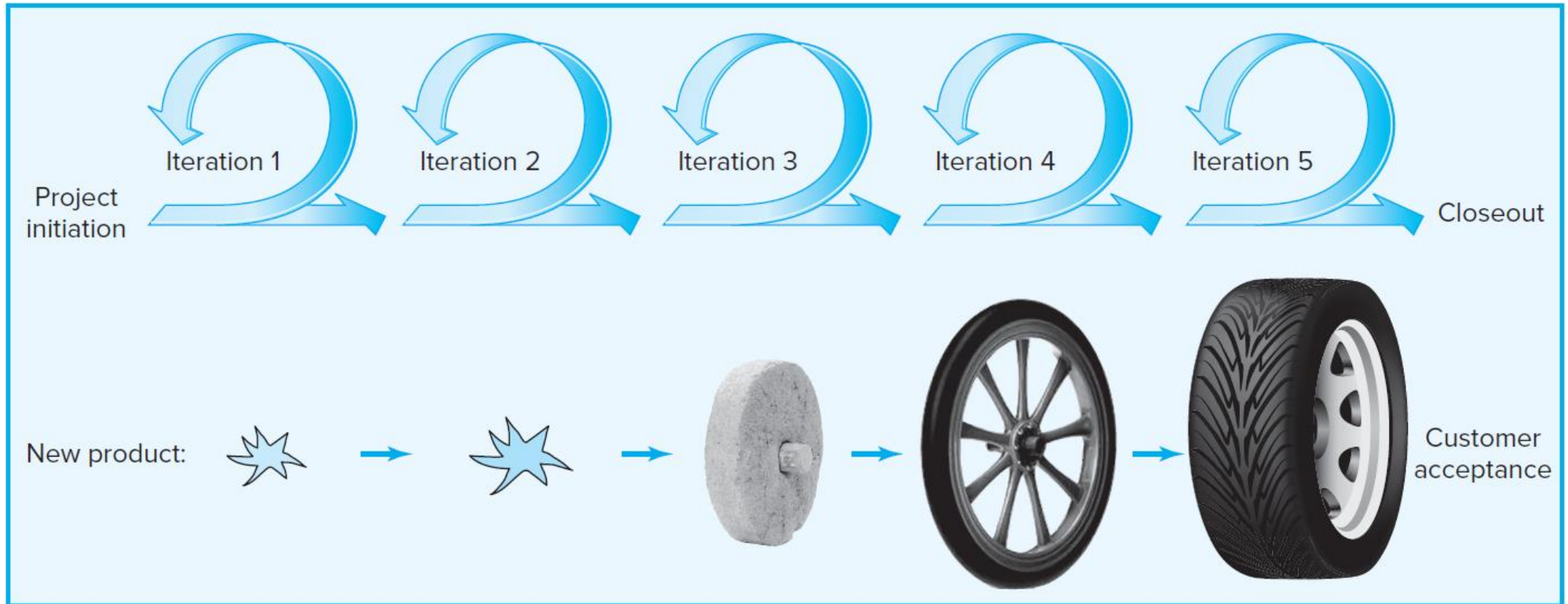
Traditional	Agile
Design up front	Continuous design
Fixed scope	Flexible scope
Deliverables	Features/requirements
Freeze design as early as possible	Freeze design as late as possible
Low uncertainty	High uncertainty
Avoid change	Embrace change
Low customer interaction	High customer interaction
Conventional project teams	Self-organized project teams

15.2 Agile PM

- Utilizes a **rolling wave planning** and scheduling project methodology.
- Is continuously developed through a series of incremental iterations over time.
 - Iterations are short time frames (“time boxes”).
 - The goal of each iteration is to develop a workable product that satisfies one or more desired product features to demonstrate to the customer and other key stakeholders.
 - At the end of each iteration, stakeholders and customers review progress and re-evaluate priorities to ensure alignment with customer needs and company goals.
 - Each new iteration subsumes the work of the previous iterations and adds new capabilities to the evolving product.



Iterative, Incremental Product Development





Advantages of Iterative Development Process

- Continuous integration, verification, and validation of the evolving product.
- Frequent demonstration of progress to increase the likelihood that the end product will satisfy customer needs.
- Early detection of defects and problems.



Other Methodologies Responding to the Challenges of Unpredictable Projects

- Scrum
- Extreme Programming (XP)
- Agile Modeling Lean Development
- RUP (Rational Unified Process)
- Crystal Clear
- Dynamic Systems Development Method (DSDM)
- Rapid Product Development (RPD)



Agile Principles

- Focus on customer value
- Iterative and incremental delivery
- Experimentation and adaptation
- Self-organization
- Servant leadership
- Continuous improvement

15.3 Agile PM in Action: Scrum

Scrum

- Is a holistic approach to developing new products, where the whole team “tries to go the distance as a unit, passing the ball back and forth.”
- Begins with a **high-level scope definition** and **ballpark time** and **cost estimates** for the project.
- Use product *features* as deliverables.
 - A *feature* is defined as a piece of a product that delivers some useful functionality to a customer.
 - The project team tackles the highest-priority feasible feature first.
 - Priorities are re-evaluated after each iteration.
 - Iterations are called sprints and should last no longer than four weeks.
 - The goal of each sprint is to produce fully functional features.
 - Specific features are created according to four distinct phases: analysis, design, build, and test.

Scrum Development Process

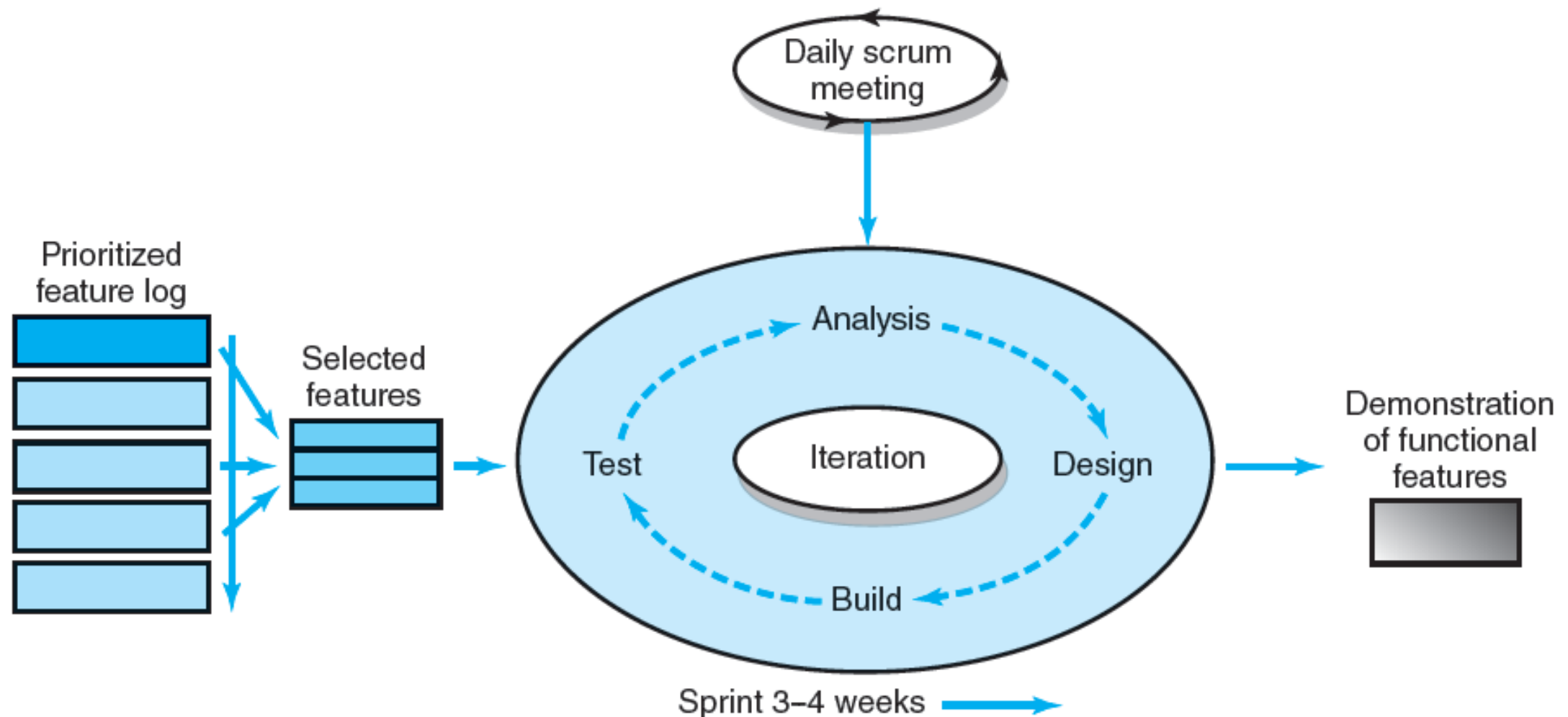


FIGURE 15.4

Key Roles and Responsibilities in the Scrum Process

Product Owner

- Acts on behalf of customers/end users to represent their interests.
- Works with the development team to refine features through stories and end users cases.
- Ensures that the development team focuses their efforts on developing a product that will fulfill the business objective of the project.

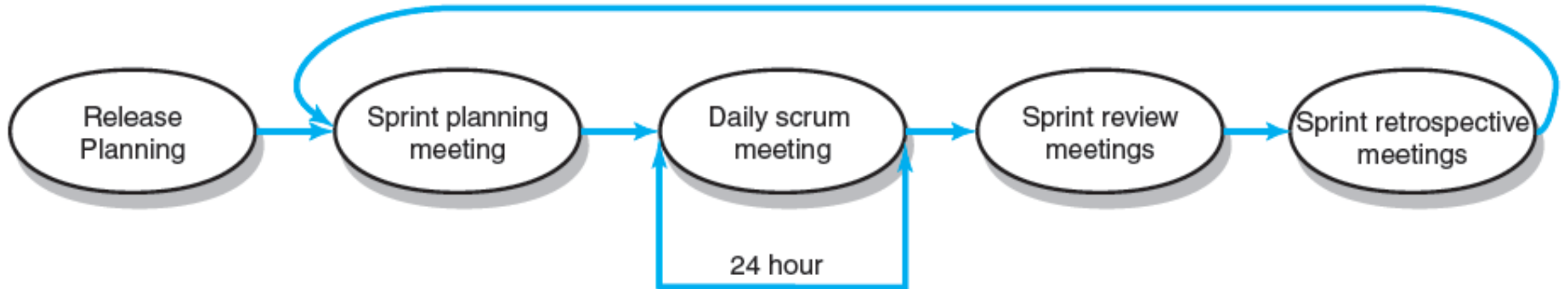
Development Team

- Is responsible for delivering the product.
- Is typically made up of five to nine people with cross-functional skill sets.

Scrum Master (Project Manager)

- Facilitates the scrum process and resolves impediments at the team and organization levels.
- Acts as buffer between the team and outside interference but not the leader of team (the team leads itself!)
- Helps the product owner with planning and try to keep the team energized.

Scrum Meetings



Scrum Artifacts

1. Product Backlog

- **Definition:** The Product Backlog is a prioritized list of all the features, requirements, enhancements, and bug fixes that might be needed for the product. It is essentially a "wish list" of everything the team could work on.
- **Ownership:** Managed by the **Product Owner**, who ensures it reflects the product vision and priorities.
- **Scope:** Covers the entire project or product lifecycle.
- **Content:** Includes high-level features or user stories, detailed items, and technical improvements.
- **Dynamic Nature:** Continuously evolves and adapts based on changing customer needs, feedback, and business priorities.
- **Purpose:** Serves as the single source of truth for work to be done on the product.

2. Sprint Backlog

- **Definition:** The Sprint Backlog is a subset of the Product Backlog, containing items that the team commits to completing during a specific sprint.
- **Ownership:** Managed by the **Development Team**, as they are responsible for planning and delivering the work.
- **Scope:** Focused on the current sprint, usually spanning 1-4 weeks.
- **Content:** Includes selected Product Backlog items, detailed tasks to complete them, and technical work like bug fixes or improvements.



Static During Sprint: Unlike the Product Backlog, the Sprint Backlog is not supposed to change once the sprint starts (except in rare cases).

FIGURE 15.5

Partial Product Backlog

	A	B	C	D	E	F	G
1		Phone-In Prescription Software Project					
2		Product Backlog					
3							
4	ID	Product	Priority	Status	Estimate Hours	Actual Hours	
5							
6							
7	1	Customer Information	2	Complete	100	90	
8	2	Insurance Information	1	Complete	160	180	
9	3	Drug Information	3	Started	80		
10	4	Doctor Information	5	Not started	40		
11	5	Inventory status	4	Started	120		
12							

FIGURE 15.6

- Product Backlog:** The Product Backlog is a prioritized list of all the features, requirements, enhancements, and bug fixes that might be needed for the product. It is essentially a "wish list" of everything the team could work on.
- Ownership:** Managed by the **Product Owner**, who ensures it reflects the product vision and priorities.
- Scope:** Covers the entire project or product lifecycle.
- Content:** Includes high-level features or user stories, detailed items, and technical improvements.
- Dynamic Nature:** Continuously evolves and adapts based on changing customer needs, feedback, and business priorities.

Partial Sprint Backlog

FIGURE 15.7

	A	B	C	D	E	F	G	H	I
1	Phone-In Prescription Software Project								
2	Sprint Backlog								
3									
4	Sprint Description	Responsible	Actual Hours	Remaining Hours	Defined	In Progress	Tested	Accepted	
5									
6									
7	Drug categories	RT	16	0	X	X	X	☑	
8	Generics	CG	32	0	X	X	X	☑	
9	Branded	AL	24	8	X	X	X		
10									
11									
12	Design drug inventory system	EL	40	0	X	X	X	☑	
13	Code inventory availability	CE		32					
14	Code manufacture order	MC		32					
15	Integrate all inventory systems	LE	4	16	X				
16									

Sprint Backlog: The Sprint Backlog is a subset of the Product Backlog, containing items that the team commits to completing during a specific sprint.

- Ownership:** Managed by the **Development Team**, as they are responsible for planning and delivering the work.
- Scope:** Focused on the current sprint, usually spanning 1-4 weeks.
- Content:** Includes selected Product Backlog items, detailed tasks to complete them, and technical work like bug fixes or improvements.
- Static During Sprint:** Unlike the Product Backlog, the Sprint Backlog is not supposed to change once the sprint starts (except in rare cases).
- Purpose:** Provides a focused plan for the team to achieve the sprint goal.

Sprint Burndown Chart

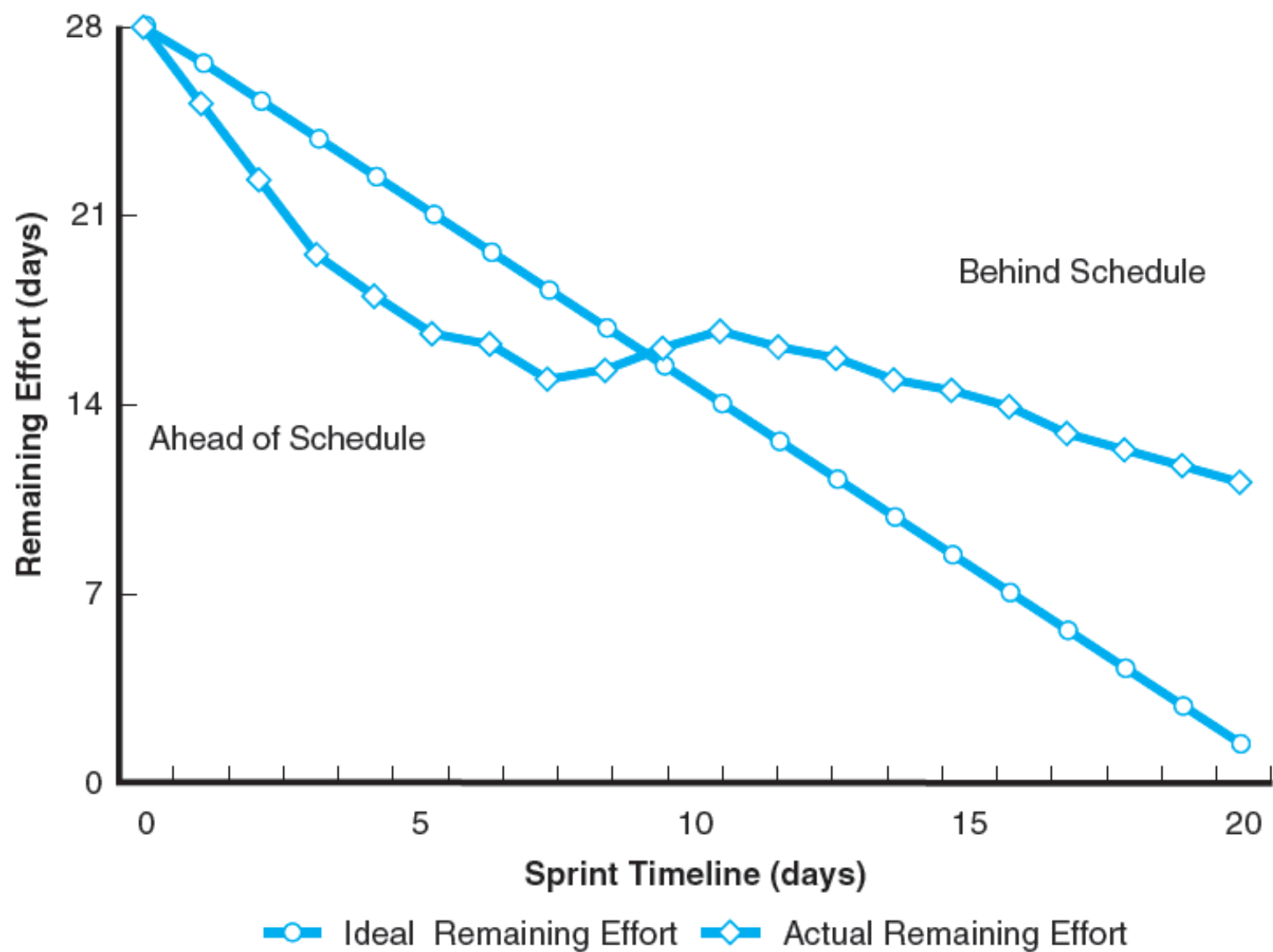


FIGURE 15.8

Release Burndown Chart after Six Sprints

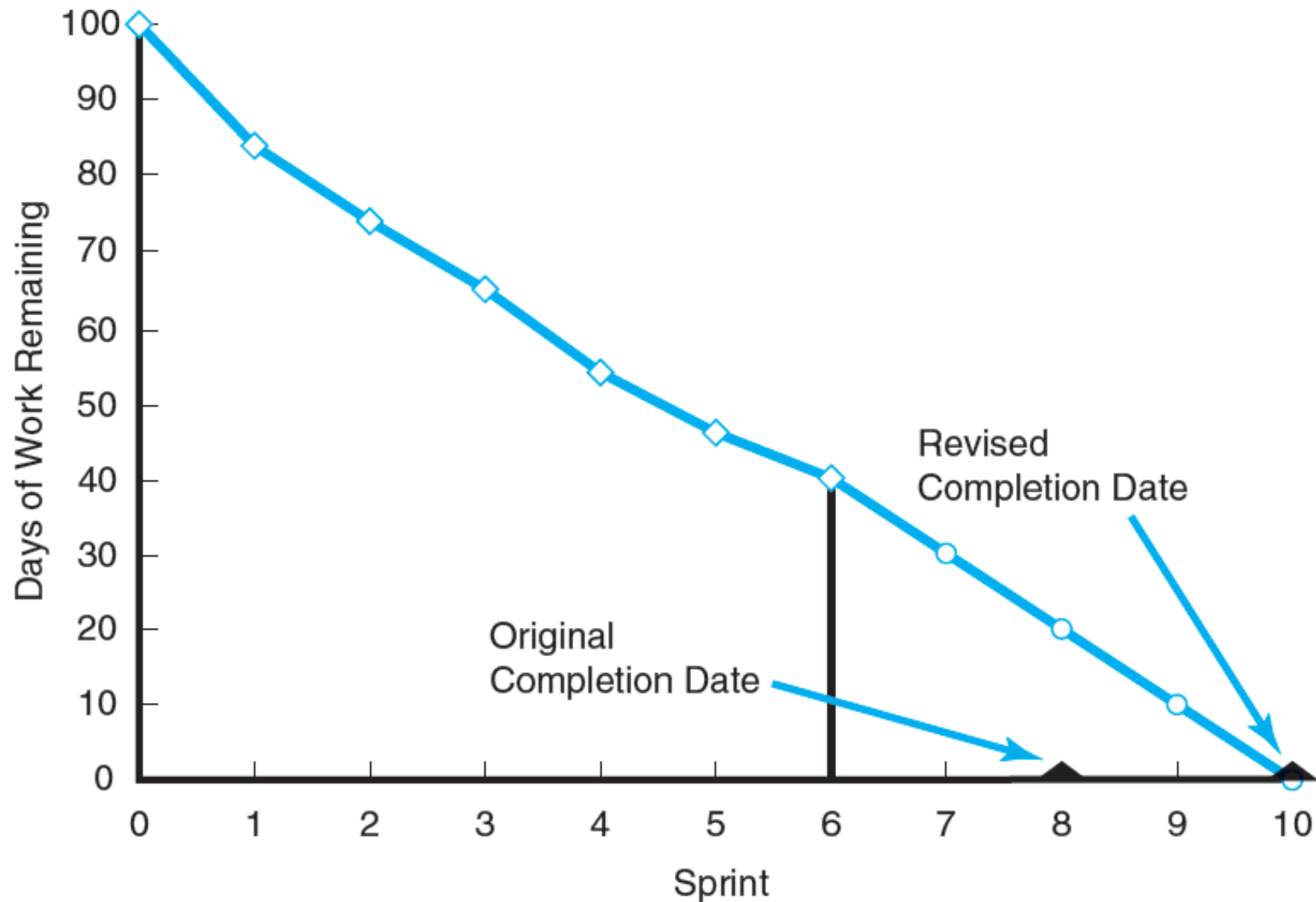


FIGURE 15.9

15.4 Extreme Programming and Kanban

Extreme Programming (XP)

- Is a more aggressive form of Scrum that organizes people to produce higher-quality software more efficiently.
- Considers change a natural, even desirable aspect of software development projects and should be planned for, instead of eliminated.
- Are test-driven development and paired programming.
- Is founded on five values: communication, simplicity, feedback, courage and respect.

Kanban

- Is a lean management methodology that has been adapted by Agile practitioners to help manage project work flow.
- Consists of a whiteboard divided into three columns: Planned, Work in Progress, and Done.
- Is based on the idea of a pull system—signaling when the team is ready for more work.
- Helps the team visualize the work flow on the project and focus their attention on the most critical work.

15.5 Applying Agile PM to Large Projects

Scaling

- Involves several teams working on different features at the same time.
- Needs to make sure that the different features being created work in harmony with each other—integration.

Staging

- Requires significant up-front planning to manage the interdependences of different features that will be developed.
- Involves developing protocols and defining roles for coordinating efforts and assuring compatibility.

15.6 Limitations and Concerns

- Agile PM is not a simple methodology. Adoption tends to evolve over time.
- Many of the Agile principles, including self-organizing teams and intense collaboration, are incompatible with corporate cultures.
- Agile PM does not satisfy top management's need for control.
- Agile skeptics warn that evolving requirements contribute to scope creep.
- Agile PM requires active customer involvement.

15.7 Hybrid Models

- Agile PM is used up front to resolve key scope questions and define requirements. Then traditional PM is applied to complete the project.
- Incremental, experimentation is used to resolve technical issues, allowing for a formal implementation plan.
- Many companies use hybrid models on large projects that combine waterfall and Agile methods.
- Teams use Agile techniques on plan-driven projects. Teams use shorter iterations and retrospectives to get critical customer feedback.
- Kanban methods are used by traditional teams to visualize work and identify bottlenecks in the project schedule.



Key Terms

- Agile Project Management
- Extreme Programming
- Feature
- Hybrid model
- Iterative, incremental development (IID)
- Kanban
- Product backlog
- Product owner
- Release burndown chart
- Scaling
- Scrum master
- Self-organizing team
- Sprint backlog
- Sprint burndown chart
- Waterfall method



Any Questions!