

Reducing Project Duration

- Rationale for Reducing Project Duration
- Options for Accelerating Project Completion
- Project Cost-Duration Graph
- Constructing a Project Cost-Duration Graph
- Practical Considerations
- What if Cost, not Time, is the issue?
- Key terms

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Imagine the following scenarios:

- After finalizing your project schedule, you realize the estimated completion date is two months beyond what your boss publicly promised an important customer.
- Five months into the project, you realize that you are already three weeks behind the drop-dead date for the project.
- Four months into a project top management changes its priorities and now tells you that money is not an issue. Complete the project ASAP!

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Rationale for Reducing Project Duration

- Time Is Money: Cost-Time Tradeoffs
 - Reducing the time of a critical activity usually incurs additional direct costs.
 - Cost-time solutions focus on reducing (crashing) activities on the critical path to shorten overall duration of the project.
 - Reasons for imposed project duration dates:
 - Customer requirements and contract commitments
 - Time-to-market pressures
 - Incentive contracts (bonuses for early completion)
 - Unforeseen delays
 - Overhead and goodwill costs
 - Pressure to move resources to other projects

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Options for Accelerating Project Completion

- Adding Resources
- Outsourcing Project Work
- Scheduling Overtime
- Establishing a Core Project Team
- Do It Twice—Fast and Correctly
- Fast-Tracking
- Critical-Chain
- Reducing Project Scope
- Compromise Quality



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Explanation of Project Costs

• Project Indirect Costs

- Costs that cannot be associated with any particular work package or project activity.
 - Supervision, administration, consultants, and interest
- Costs that vary (increase) with time.
 - Reducing project time directly reduces indirect costs.

• Direct Costs

- Normal costs that can be assigned directly to a specific work package or project activity.
 - Labor, materials, equipment, and subcontractors
- Crashing activities increases direct costs.

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Project Cost—Duration Graph

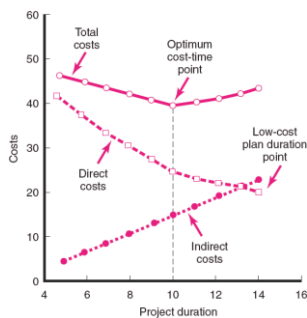


FIGURE 9.1

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Reducing Project Duration to Reduce Project Cost

Identifying direct costs to reduce project time

- Gather information about direct and indirect costs of specific project durations.
- Search critical activities for lowest direct-cost activities to shorten project duration.
- Compute total costs for specific durations and compare to benefits of reducing project time.

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Constructing a Project Cost—Duration Graph

- Find total direct costs for selected project durations.
- Find total indirect costs for selected project durations.
- Sum direct and indirect costs for these selected project durations.
- Compare additional cost alternatives for benefits.

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Constructing a Project Cost—Duration Graph

- **Determining Activities to Shorten**
 - Shorten the activities with the smallest increase in cost per unit of time.
 - Assumptions:
 - The cost relationship is linear.
 - Normal time assumes low-cost, efficient methods to complete the activity.
 - Crash time represents a limit—the greatest time reduction possible under realistic conditions.
 - Slope represents a constant cost *per unit of time*.
 - All accelerations must occur within the normal and crash times.

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Activity Graph

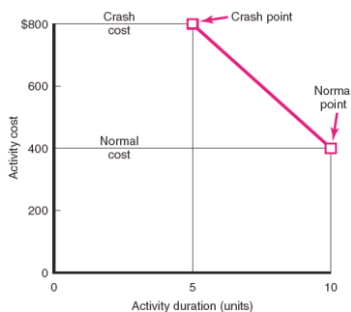


FIGURE 9.2

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Cost—Duration Trade-off Example

Activity ID	Slope	Maximum crash time	Direct costs			
			Normal		Crash	
			Time	Cost	Time	Cost
A	\$20	1	3	\$50	2	\$70
B	40	2	6	80	4	160
C	30	1	10	60	9	90
D	25	4	11	50	7	150
E	30	2	8	100	6	160
F	30	1	5	40	4	70
G	0	0	6	70	6	70

FIGURE 9.3

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Cost—Duration Trade-off Example (cont'd)

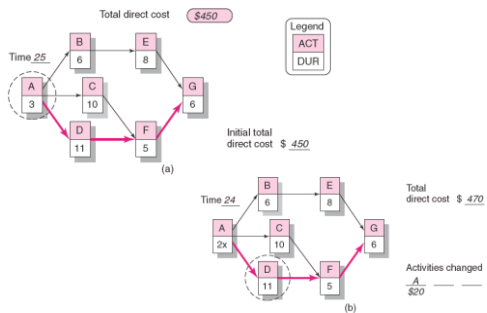


FIGURE 9.3 (cont'd)

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Cost—Duration Trade-off Example (cont'd)

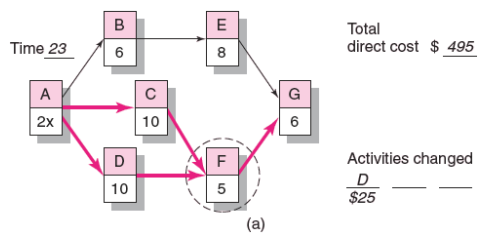


FIGURE 9.4 (cont'd)

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Cost—Duration Trade-off Example (cont'd)

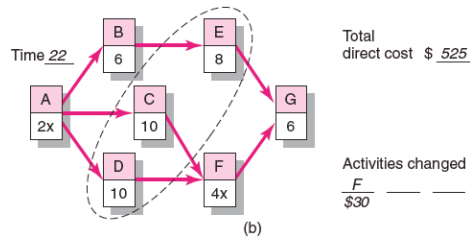


FIGURE 9.4 (cont'd)

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Cost—Duration Trade-off Example (cont'd)

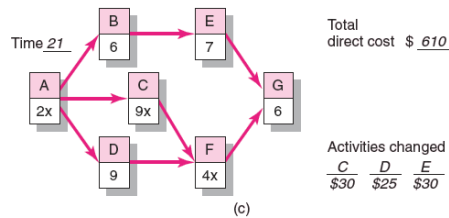


FIGURE 9.4 (cont'd)

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Summary Costs by Duration

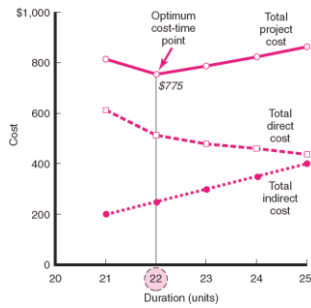
Project duration	Direct costs	+	Indirect costs	=	Total costs
25	450		400		\$850
24	470		350		820
23	495		300		795
22	525		250		775
21	610		200		810

FIGURE 9.5

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Project Cost—Duration Graph



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FIGURE 9.6
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Practical Considerations

- Using the Project Cost—Duration Graph
- Crash Times
- Linearity Assumption
- Choice of Activities to Crash Revisited
- Time Reduction Decisions and Sensitivity

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What if Cost, Not Time is the Issue?

- Commonly Used Options for Cutting Costs
 - Reduce project scope
 - Have owner take on more responsibility
 - Outsourcing project activities or even the entire project
 - Brainstorming cost savings options

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Key Terms

Crash point
Crash time
Direct costs
Fast-tracking
Indirect costs
Outsourcing
Phase project delivery
Project cost–duration graph

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