Chapter 6:
Project Time Management

Lecture: 4

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Information Technology Project Management, Fifth Edition

PROGRAM EVALUATION AND REVIEW TECHNIQUE (PERT)

- Program (Project) Evaluation and Review Technique (PERT) is a project management tool used to schedule, organize, and coordinate tasks within a project.

PROGRAM EVALUATION AND REVIEW TECHNIQUE (PERT)

- Steps:
  - Identify the specific activities and milestones.
  - Determine the proper sequence of the activities.
  - Construct a network diagram.
  - Estimate the time required for each activity.
  - Determine the critical path.
  - Update the PERT chart as the project progresses.

Estimated Time

- Optimistic time – generally the shortest time in which the activity can be completed.
- Most likely time – the completion time having the highest probability.
- Pessimistic time – the longest time that an activity might require.

Estimated Time

Expected time = (Optimistic + 4 x Most likely + Pessimistic) / 6

To calculate the variance for each activity completion time, if three standard deviation times were selected for the optimistic and pessimistic times, then there are six standard deviations between them, so the variance is given by:

Variance= $[(\text{Pessimistic} - \text{Optimistic}) / 6]^2$

Determine the critical path.

- ES – Earliest Start time
- EF - Earliest Finish time
- LS – Latest Start time
- LF - Latest Finish time
- Slack time

PERT Example

Activity	Preconditions (Predecessors)	Optimistic	Most Probable	Pessimistic
A	-	4	5	12
B	A	3	4.5	15
C	A	2	3	4
D	C	6	8	22
E	B	4	6	8
F	C	3	4	5
G	D,E	15	3	4.5
H	B	5	7	15
I	H	3	4	5
J	G,I	2	4	6

- Sketch the PERT Network
- Calculate the critical path

Answer(1)

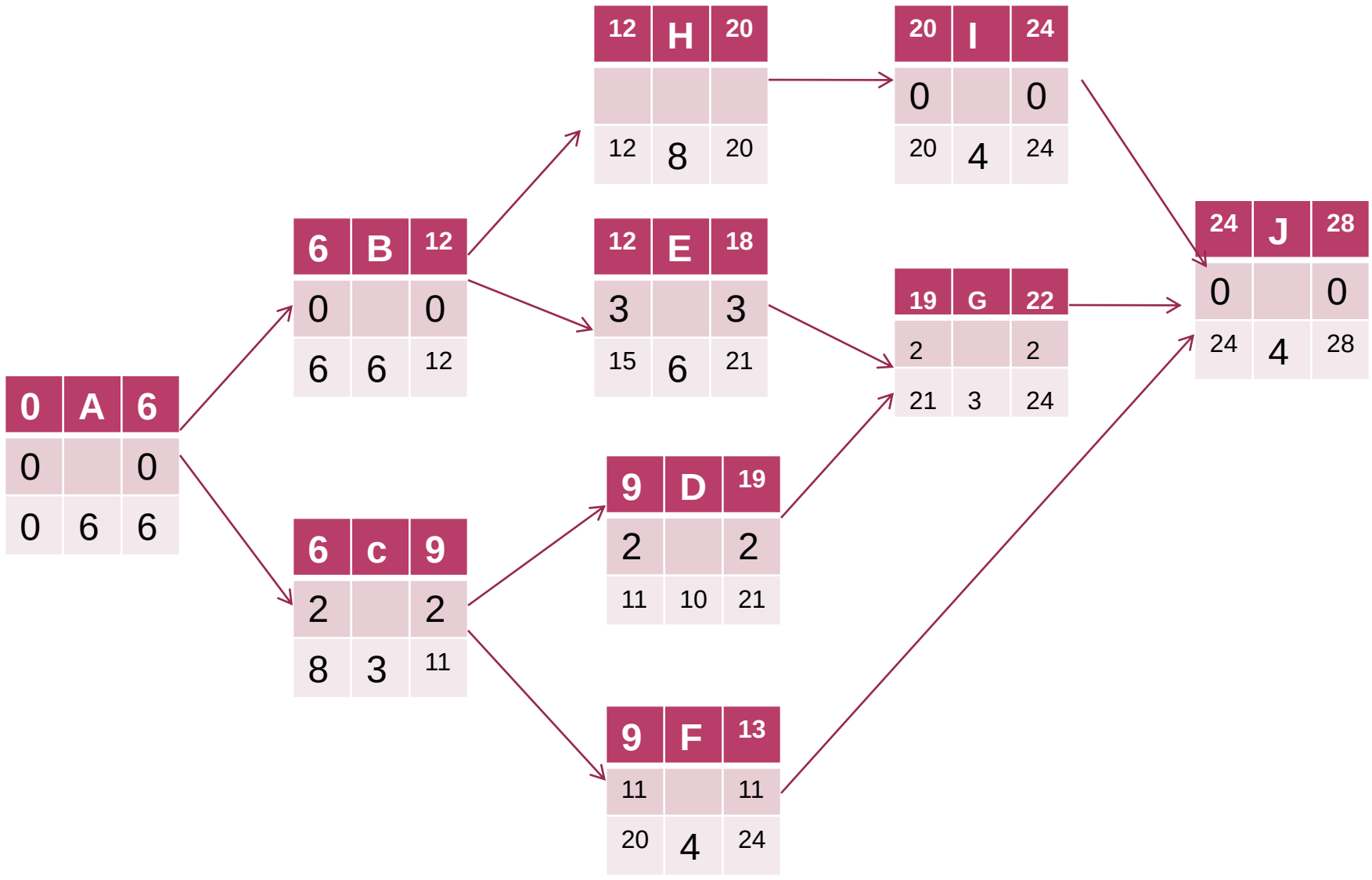
Activity	Preconditions (Predecessors)	Optimistic	Most Probable	Pessimistic	Expected Time
A	-	4	5	12	6
B	A	3	4.5	15	6
C	A	2	3	4	3
D	C	6	8	22	10
E	B	4	6	8	6
F	C	3	4	5	4
G	D,E	15	3	4.5	3
H	B	5	7	15	8
I	H	3	4	5	4
J	G,I,F	2	4	6	4

Expected time = (Optimistic + 4 x Most likely + Pessimistic) / 6

Answer(2)

- tA=4+(4*5)+12/6 = 36/6=6
- tF=3+(4*4)+5/6 = 24/6=4
- ….etc.

Answer(3)


0 A 6
0 0
0 6 6
6 B 12
0 0
6 6 12
6 c 9
2 2
8 3 11
12 H 20
12 8 20
12 E 18
3 3
15 6 21
9 D 19
2 2
11 10 21
9 F 13
11 11
20 4 24
20 I 24
0 0
20 4 24
19 G 22
2 2
21 3 24
24 J 28
0 0
24 4 28

Chapter 7:
Project Cost Management

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What is Cost and Project Cost Management?

- **Cost** is a resource sacrificed or foregone to achieve a specific objective or something given up in exchange
- Costs are usually measured in monetary units like dollars
- **Project cost management** includes the processes required to ensure that the project is completed within an approved budget

Project Cost Management Processes

- **Cost estimating**: developing an approximation or estimate of the costs of the resources needed to complete a project
- **Cost budgeting**: allocating the overall cost estimate to individual work items to establish a baseline for measuring performance
- **Cost control**: controlling changes to the project budget

Cost of Software Defects

Phase of Software Development	Relative Cost to Repair Defects
Requirements and Analysis	1X
Coding and Unit Test	5X
Integration and System Test	10X
Beta Test	15X
Post-Product Release	30X

*Note: X is a normalized unit of cost and can be expressed in dollars, person-hours, etc.

Cost Management Plan

- A **cost management plan** is a document that describes how the organization will manage cost variance on the project

Surveyor Pro Project Cost Estimate

Surveyor Pro Project Cost Estimate Created October 5, 2008

	# Units/Hrs.	Cost/Unit/Hr.	Subtotals	WBS Level 1 Totals	% of Total
WBS Items					
1. Project Management				**$306,300**	**20%**
Project manager	960	$100	$96,000		
Project team members	1920	$75	$144,000		
Contractors (10% of software development and testing)			$66,300		
2. Hardware				**$76,000**	**5%**
2.1 Handheld devices	100	$600	$60,000		
2.2 Servers	4	$4,000	$16,000		
3. Software				**$614,000**	**40%**
3.1 Licensed software	100	$200	$20,000		
3.2 Software development*			$594,000		
4. Testing (10% of total hardware and software costs)			$69,000	**$69,000**	**5%**
5. Training and Support				**$202,400**	**13%**
Trainee cost	100	$500	$50,000		
Travel cost	12	$700	$8,400		
Project team members	1920	$75	$144,000		
6. Reserves (20% of total estimate)			$253,540	**$253,540**	**17%**
Total project cost estimate				**$1,521,240**	

* See software development estimate