

Lecture 3 – Project Management, Metrics, KPIs

Question 1

Projects & Project Management

The iron triangle is expressing the idea that:

- a) Quality comes from an appropriate combination of time and cost appropriate for the scope
- b) Scope, time, and cost can usually be traded off for each other while maintaining quality
- c) Scope is built on quality understanding of cost and time
- d) Scope is built on quality application of budget and time

Question 1.1

Projects & Project Management

Which of the following are likely projects (rather than tasks or areas of responsibility)?

- A: Replace your laptop with another one with better performance
- B: Send Basem a Teams message asking him to recommend hamster names
- C: Exercise and eat well
- D: Do 5 push-ups

- a) A only
- b) A and B
- c) B and C
- d) D only
- e) D and B

Question 1.2

Projects & Project Management

Which of the following situations could make "Do 5 push-ups" a project?

- a) You make this a daily task that you must complete every day from now on
- b) You can easily do 5 push-ups right now
- c) You can't do 5 push-ups where you are right now (e.g., you're in class), but can put it on an "at-home" list of actions to do once you're at home
- d) You can't physically do 5 push-ups, so would need to see a personal trainer and work your way up to this goal through a series of tasks

Question 2

Project Lifecycles

Ideally, the scope of a project is defined in the:

- A) Initiation Stage
- B) Planning stage

- C) Execution stage
- D) Monitoring & control

Question 2.1

Project Lifecycles

The decision about whether to undertake the project happens during the:

- A) Initiation Stage
- B) Planning stage
- C) Execution stage
- D) either initiation stage or planning stage
- E) Monitoring & control stage

Question 2.2

Project Lifecycles

When during a project should the goals of the project be determined or reviewed?

- A) Initiation Stage
- B) Planning stage
- C) Execution stage
- D) Both the Initiation stage and Planning stage
- E) Monitoring & control stage

Question 2.3

Project Lifecycles

Project execution entails:

- A) Economic evaluation of the project's cash flows
- B) Carrying out the defined project plan processes to achieve the project's objectives
- C) Evaluating the accuracy of the time, cost, and resource estimates compared to the actual results
- D) Identifying corrective actions needed

Question 2.4

Project Lifecycles

The project management tools discussed in class would be created during which stage of a project?

- A) Initiation Stage
- B) Planning stage
- C) Execution stage
- D) Monitoring & Control
- E) Closure

Question 2.5

Project Lifecycles

Which of the following are the steps of the natural planning model?

- a) Determine time, cost, performance, and customer satisfaction
- b) Determine revenue growth, customer satisfaction, labour productivity, number of customer complaints
- c) Determine customer satisfaction, number of warranty claims, schedule adherence, materials costs
- d) Determine material costs, labour costs, capital costs, revenue growth
- e) Determine purpose & principles, envision the outcome, generate ideas, organize ideas, and determine next actions

Question 2.6

Project Lifecycles

Consider a project aiming to improve the assembly line efficiency at a factory. After designing and testing the new machinery, the education/training of employees on the new operations to put it into practice would fall under what lifecycle stage?

- A) Initiation stage
- B) Planning stage
- C) Execution stage
- D) Monitoring and control
- E) Closure (or after closure)

Question 3

Project Management Tools

A Gantt chart is best described as:

- A) A chart that depicts the timing and magnitude of a project's cash flows.
- B) A bar chart that depicts the timing and sequence of a project's activities
- C) A numbered list of a project's activities that indicates their importance
- D) An organizational chart of a project's activities
- E) A bar graph of a project's costs over the duration of the project.

Question 3.1

Project Management Tools

Which of the following is a good time to make use of CPM?

- A) The project's goals aren't clearly defined
- B) The project monitoring & control phase has identified that the project is proceeding on-schedule
- C) The project has complicated interdependencies between tasks and you need to allocate resources between the tasks to determine which should be prioritized

- D) The project's Gantt chart has identified that there's no float in the project
- E) It's not clear which tasks need to be completed in each project area to make the project successful

Question 3.2

Project Management Tools

When crashing a project, if you're only going to crash one activity, which one should you choose?

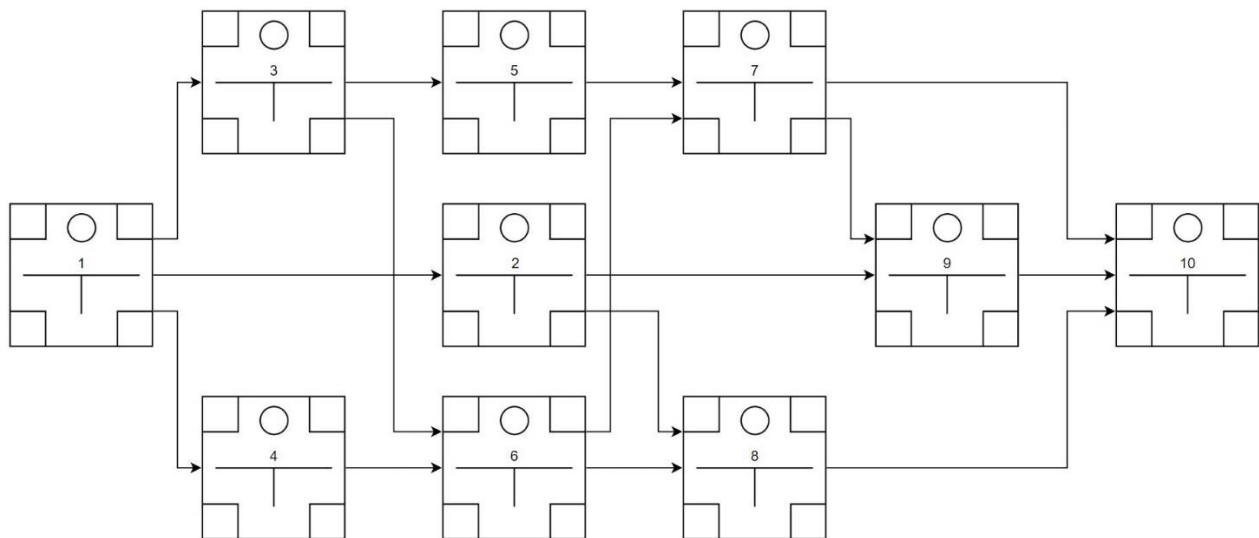
- A) The one that costs the least to crash
- B) The one closest to the end of the project
- C) The one with the greatest amount of float
- D) One that's along the critical path
- E) The one closest to the beginning of the project

Question 4

Project Management Tools

Review the network diagram below, which represents a project, with the ten project activities split into separate nodes.

If the estimated duration for each activity is shown in the table below, how much float is there in the completion of Activity 8?

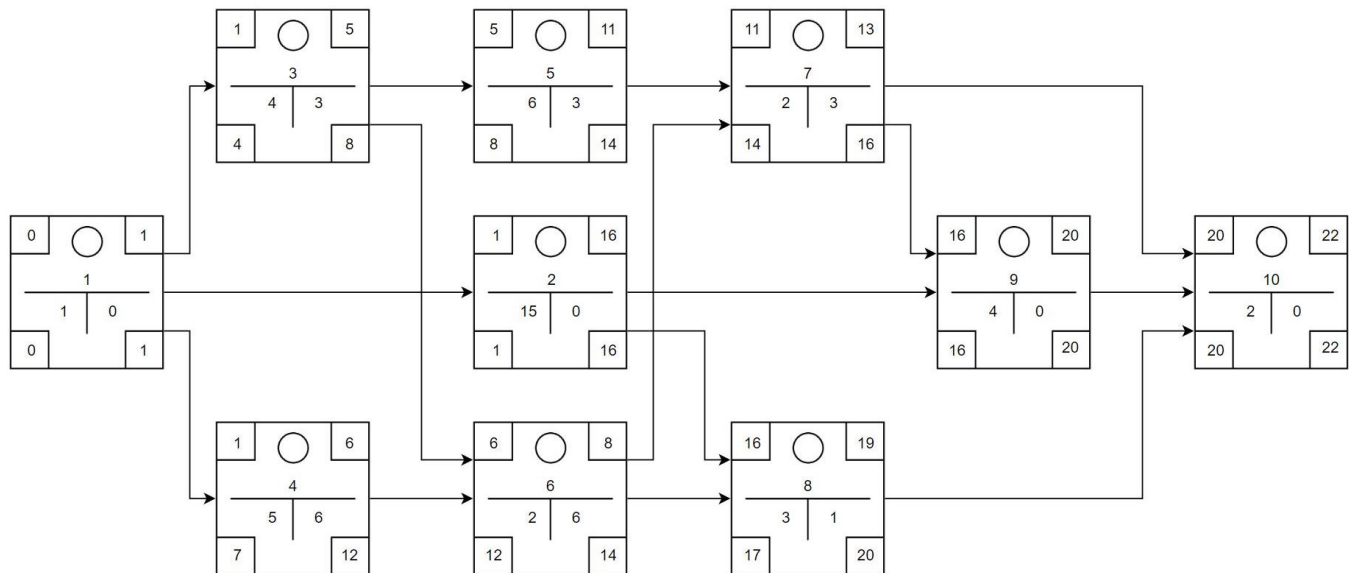


Activity	Duration (days)
1	1
2	15
3	4
4	5
5	6
6	2
7	2

8	3
9	4
10	2

- A) No float, Activity 8 is on the critical path.
- B) 1 day
- C) 3 days
- D) 4 days
- E) 6 days

Full solution is as follows:



Question 4.1

Project Management Tools

What is the Late Start Date for Activity 7?

- A) Day 11
- B) Day 13
- C) Day 14
- D) Day 16
- E) Day 17

Question 4.2

Project Management Tools

What is the critical path for this project?

- A) 1 > 2 > 9 > 10
- B) 1 > 4 > 6 > 7 > 9 > 10

- C) 1 > 3 > 5 > 7 > 9 > 10
- D) 1 > 2 > 8 > 10
- E) 1 > 3 > 6 > 7 > 9 > 10

Question 4.3

Project Management Tools

What is the Late End Date for Activity 4?

- A) Day 6
- B) Day 8
- C) Day 12
- D) Day 14
- E) Day 15

Question 4.4

Project Management Tools

What is the estimated completion date for the project?

- A) Day 19
- B) Day 20
- C) Day 22
- D) Day 24
- E) Day 25

(C) Day 22.

Question 4.5

Project Management Tools

Assume that shortening the overall duration of the project would give a benefit of \$5,000 per day that we can shorten it. The following information is provided for considering the crashing of project activities.

Activity	Duration (days) (Not crashed)	Cost of completing activity (Not crashed)	Duration (days) (Crashed)	Cost of completing activity (If Crashed)
1	1	\$10,000	N/A	N/A
2	15	\$150,000	12	\$180,000
3	4	\$15,000	3	\$20,000
4	5	\$30,000	3	\$35,000
5	6	\$20,000	N/A	N/A
6	2	\$6,000	1	\$12,000
7	2	\$15,000	1	\$22,000
8	3	\$10,000	2	\$18,000
9	4	\$60,000	2	\$80,000
10	2	\$5,000	1	\$8,000

Which of the following options provides the best net value, when compared to not crashing any activities?

- A) Crash activities 2 and 4

- B) Crash activities 2, 6, and 8
- C) Crash activities 4 and 7
- D) Crash activity 10
- E) Crash activity 9

Crashing activities 2 & 4: Additional costs of \$35,000 compared to not crashing, duration of project ends 3 days earlier, net value of -\$20,000.

Crashing activities 2, 6, & 8: Additional costs of \$44,000 compared to not crashing, duration of project ends 3 days earlier, net value of -\$29,000

Crashing activities 4 & 7: Both are off the critical path; pointless as there is no benefit, only additional costs

Crashing activity 10: Additional costs of \$3,000 compared to not crashing, project ends 1 day earlier, net value of +\$2,000

Crashing activity 9: Additional costs of \$20,000 compared to not crashing, project ends 2 days earlier, net value of -\$10,000.

Question 4.6

Project Management Tools

If every crash-able activity on the current critical path is crashed, what is the resulting net value compared to not crashing any activities?

- A) No change in net value
- B) \$25,000
- C) -\$53,000
- D) -\$28,000
- E) \$3,000

Question 4.7

Project Management Tools

If every activity on the critical path is crashed, what is the “new” critical path for the project after crashing these activities (if it stays unchanged, select the same answer you previously chose in Question 11)?

- A) 1 > 2 > 9 > 10
- B) 1 > 4 > 6 > 7 > 9 > 10
- C) 1 > 3 > 5 > 7 > 9 > 10
- D) 1 > 2 > 8 > 10
- E) 1 > 3 > 6 > 7 > 9 > 10

Question 5

Metrics and KPIs

Which of the following would **not** be good KPIs for a project to reduce carbon emissions from a factory by 5%?

- a) Likely money spent on the project
- b) Likely time to complete the project
- c) Likely reduction in carbon emission
- d) Likely reduction in environmental impact
- e) None of the above would be good KPIs for this project

Question 5.1

Metrics and KPIs

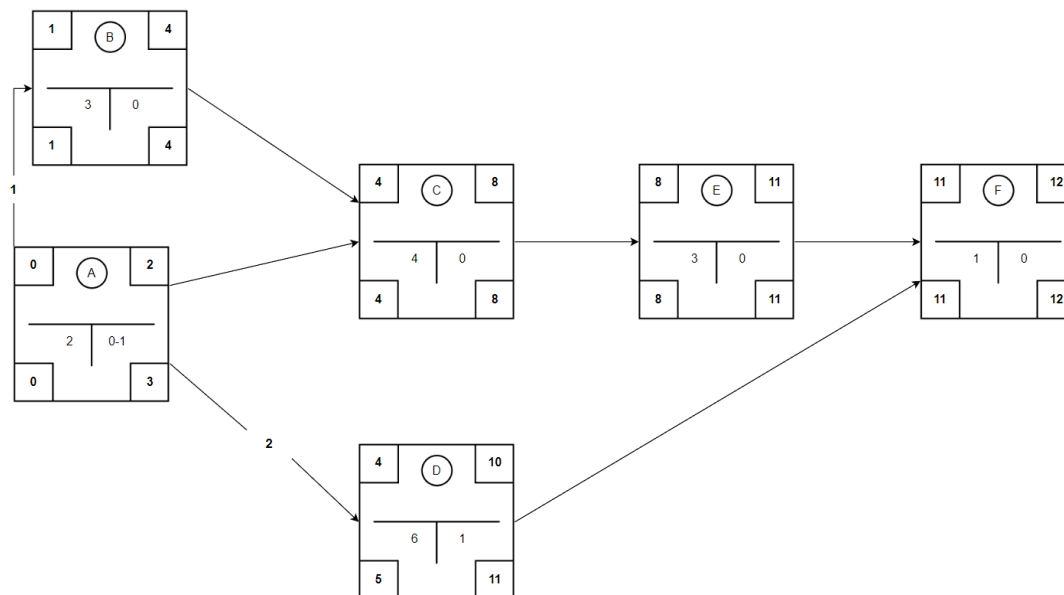
What are the five attributes of a KPI?

- A) Assessable, Qualitative, Economic, Appropriate, Repeatable
- B) Predictive, Measurable, Actionable, Relevant, Few in number
- C) Time, Cost, Performance, Customer satisfaction, Resource allocation
- D) Controllable, Reasonable, Immediate, Value-based, Extensive
- E) Critical, Monitorable, Implementable, Streamlined, Objective-based

Question 6

CPM

Consider the CPM network below:



What is meant by the "1" between activities A and B?

- A. Activity B cannot begin until 1 day after activity A has begun.
- B. Activity B will be completed by Team 1
- C. Activity B has one day of float
- D. Activity B's duration must be 1 day longer than activity A's duration
- E. Activity B has first priority
- F. Activity B cannot start until 1 day after activity A has ended.

This is a lag indicator on a start-start relationship, meaning that activity B must not begin until 1 day has passed since activity A started. Showing this 1 changes the lag from the default 0; i.e., without a number it would mean "activity B must not begin until [0 days have passed since] activity A started".

Question 6.1

CPM

What is meant by the "2" between activities A and D?

- A. Activity D cannot start until 2 days after activity A has ended.
- B. Activity D will be completed by Team 2
- C. Activity D has one day of float
- D. Activity D's duration must be 2 days longer than activity A's duration
- E. Activity D has second priority
- F. Activity D cannot begin until 2 days after activity A has started.

This is a lag indicator on a finish-start relationship, meaning that activity D must not begin until 2 days have passed since activity A finished.

Question 6.2

CPM

What is the critical path of this project?

A_(start only) to B to C to E to F

Because of the start-start relationship from A to B, this leads to starting A being on the critical path (i.e., if its start time is delayed so is the project), but finishing A is not (i.e., its finish time has float in it; we could finish a day later and not delay anything)

Question 6.3

CPM

What is meant by the "0-1" inside the node for activity A?

There is no float between the earliest and latest possible start dates for activity A. However, the end date for activity A may be delayed by 1 day without the project taking longer to end.

Question 6.4

CPM

If all of the lags were set to 0, what *would* be the critical path of the project?

The same: A_(start only) to B to C to E to F

Question 6.4

CPM

If all of the lags were set to 0, what would A's float be?

