

# IQRA NATIONAL UNIVERSITY

## Construction management (Final Quiz)

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Section = (A)

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Q# 01

You have a team of project managers -----  
----- channels now?

Given data:

Number of communication = 6  
Additional state holders = 2

Required data:

Identify the number of communication channels after increasing the scope of work = ?

Sol:-

As we know that;

Number of communication channel =  $\frac{n(n-1)}{2}$   
The number of people involved in <sup>2</sup> six communication channels  $\Rightarrow$

$$6 = \frac{n(n-1)}{2}$$

$$12 = n(n-1) = n^2 - n$$

$$n^2 - n - 12 = 0$$

$$n^2 - 4n + 3n - 12 = 0$$

$$n(n-4) + 3(n-4) = 0$$

$$(n-4)(n+3) = 0$$

$$(n-4) = 0$$

$$n = 4$$

$$n+3 = 0$$

$$n = -3$$

(2)

So the number of people involved  
= 4.

As; There are additional stake  
holders so total number of  
people are;

$$n = 4 + 2$$

$$n = 6$$

Now, the required communication

$$\text{channel} = \frac{6(6-1)}{2}$$

$$= \frac{3 \cdot 6(6-1)}{2} = 3(5)$$

New communication channel = 15 Ans

(3)

Q # 2

(1)

If you have a project of  
10 ----- budget.

Given data:

→ Total no. of Package = 10

→ For each package planned value, Actual cost & %age of completion is known

To find:

For each package

1) Earned value = (EV) = ?

2) Cost variance = (CV) = ?

3) Schedule variance = (SV) = ?

4) Cost performance index = CPI = ?

5) Schedule performance index = SPI = ?

6) comment on each package

Sol.:

(1) Work Package 1:

1) Earned value (EV)

By formula

$EV = \text{planned value} \times \text{Rate of performance}$

$EV = P \times RP$

$EV = \$100000 \times 100\%$

$EV = \$100000 \times 1$

$EV = \$100000$

2) Cost variance (CV):

$CV = EV - AC$

$= \$100000 - 120000$

(4)

$$CV = -20000 \quad (2)$$

3) Schedule Variance (SV)

$$\begin{aligned} SV &= EV - PV \\ &= 100000 - 100000 \\ SV &= 0 \end{aligned}$$

4) Cost Performance Index (CPI)

$$CPI = \frac{EV}{AC} = \frac{100000}{120000} = 0.83$$

5) Schedule Performance Index:

$$SPI = \frac{EV}{PV} = \frac{100000}{100000} = 1$$

Comments on work Package 1:-

→ As we see the  $SV=0$  &  $SPI=1$  that's mean that project is exactly on the plan path 100%.

→ As we see that  $CV$  is (-ve) & cost performance index is less than 1 when means that the project is over budgeted.

(5)

work page (2)

(3)

1) Earned value: EV

$$EV = PV \times RP$$

$$EV = 100000 \times 100\%$$

$$EV = 100000 \times 1$$

$$\boxed{EV = 100000 \$}$$

2) Cost variance: CV:

$$CV = EV - AC$$

$$CV = 100000 - 110000$$

$$\boxed{CV = -10000 \$}$$

3) Schedule variance: SV

$$SV = EV - PV$$

$$= 100000 - 100000$$

$$\boxed{SV = 0 \$}$$

4) Cost performance index: CPI

$$CPI = \frac{EV}{AC} = \frac{100000}{110000}$$

$$\boxed{CPI = 0.90}$$

5) Schedule performance index: SPI

$$SPI = \frac{EV}{PV} = \frac{100000}{100000} = 1$$

$$\boxed{SPI = 1}$$

Comments:-

Project is exactly on the base line. As  $SV = 0$  &  $SPI = 1$  let in terms of cost the project is overbudgeted as  $CV$  is (-ve) &  $CPI$  is less than 1.

(6)

Work Page 3: (4)

1) Earned value =  $EV = PV \times RP$   
 $= EV = 100000 \times 90\%$   
 $= \boxed{EV = 90000 \$}$

2) Cost variance :  $CV$   
 $CV = EV - AC$   
 $= 90000 - 80000$   
 $\boxed{CV = 10000 \$}$

3) Schedule variance :  $SV$   
 $SV = EV - PV$   
 $= 90000 - 100000$   
 $\boxed{SV = -10000 \$}$

4) Cost performance index :  $CPI$   
 $CPI = \frac{EV}{AC} = \frac{90000}{80000} = 1.125$

5) Schedule performance index:  
 $SPI = \frac{EV}{PV} = \frac{90000}{100000}$   
 $SPI = 0.9$

Comments:

As we see that in terms of cost the project is under budgeted because the  $CV$  &  $CPI$  is the 1 & above than 1 but in terms of schedule the project is ~~potentially~~ behind the base line as  $SV = -ve$  &  $SPI$  is less than 1.

(7)

work page (4) (5)

1) Earned value : (EV)

$$EV = PV \times RP$$

$$EV = 100000 \times 80\%$$

$$EV = 80000$$

2) Cost Variance : (CV)

$$CV = EV - AC$$

$$= 80000 - 125000$$

$$\boxed{CV = -45000 \$}$$

3) Schedule Variance : (SV)

$$SV = EV - PV$$

$$SV = 80000 - 100000$$

$$\boxed{SV = -20000 \$}$$

4) Cost performance index : CPI

$$CPI = EV/AC \quad \frac{80000}{125000}$$

$$\boxed{CPI = 0.64}$$

5) Schedule Performance index = SPI:

$$SPI = EV/PV = \frac{80000}{100000} = 0.8$$

$$\boxed{SPI = 0.8}$$

Comment:

The project is over budgeted as  $CV = -ve$  &  $CPI < 1$  as used as the project is below the schedule i.e. from base line as  $SV = -ve$  &  $SPI$  is less than 1



(8)

work page (5)

(6)

1) Earned value : EV

$$EV = PV \times RP$$

$$EV = 100000 \times 50\%$$

$$\boxed{EV = 50000 \$}$$

2) Cost variance : CV:

$$CV = EV - AC$$

$$= 50000 - 75000$$

$$\boxed{CV = -25000 \$}$$

3) Schedule variance = SV:

$$SV = EV - PV$$

$$SV = 50000 - 100000$$

$$\boxed{SV = -50000 \$}$$

4) Cost performance index:

$$CPI = EV/AC = \frac{50000}{75000} = 0.67$$

$$\boxed{CPI = 0.67}$$

5) Schedule performance index = SPI

$$SPI = EV/PV = \frac{50000}{100000} = 0.5$$

$$\boxed{SPI = 0.5}$$

Comments

The project is overbudget in terms of cost as CV is (-ve) & CPI is less than 1 and in terms of scheduling the project is behind half any form its base line as  $SV = -50000 \$$  &  $SPI = 0.5$ .

(9)

work page 6

(7)

1) Earned value : (EV) :

$$EV = PV \times RP$$

$$EV = 100000 \times 0.10$$

$$EV = 0$$

2) Cost variance (CV)

$$CV = EV - AC$$

$$CV = 0 - 0$$

$$\boxed{CV = 0}$$

3) Schedule variance : SV

$$SV = EV - PV$$

$$SV = 0 - 100000$$

$$SV = -100000 \$$$

4) Cost performance index : CPI

$$CPI = EV/AC = 0/0 = 0$$

5) Schedule performance index : SPI :

$$SPI = EV/PV = \frac{0}{100000} = 0$$

Comments:

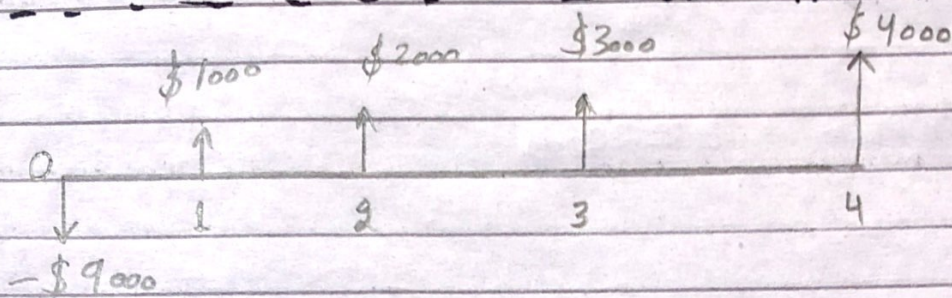
The work page 6 is not yet started so it is 100% behind the schedule.

(10)

(8)  
Workpackg 7, 8, 9, 10 is same  
like work package 6 which  
is not yet started they  
all are very begining of the  
Project.

Q# 3

A company is planning to  
 ----- on the result?

Sol:-

$$NPV = -C_0 + \frac{C_1}{1+r} + \frac{C_2}{(1+r)^2} + \dots + \frac{C_T}{(1+r)^T}$$

$$PV_0 = -C_0$$

$$PV_0 = -9000$$

$$PV_1 = \frac{C_1}{1+r} = \left( \frac{2000}{1 + \frac{10}{100}} \right)$$

$$PV_1 = 1818.18$$

$$PV_2 = \frac{C_2}{(1+r)^2} = \frac{3000}{\left(1 + \frac{10}{100}\right)^2}$$

$$PV_2 = 2479.34$$

$$PV_3 = \frac{C_3}{(1+r)^3} = \frac{3000}{\left(1 + \frac{10}{100}\right)^3}$$

$$PV_3 = 2253.94$$

$-C_0 =$  Initial inv

$C =$  Cash flow

$r =$  Discount Rate

$T =$  Time

$C_1 = 2000$

$C_2 = 3000$

$C_3 = 3000$

$C_4 = 4000$

(12)

$$PV_4 = \frac{C_4}{(1+r)^4}$$

$$= \frac{4000}{\left(1 + \frac{10}{100}\right)^4}$$

$$PV_4 = 2732.05$$

$$NPV = -C_0 + \frac{C_1}{1+r} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \frac{C_4}{(1+r)^4}$$

$$= -9000 + 1818.18 + 2479.347 + 2253.94 + 2732.05$$

$$NPV = \$ 283.51$$

Q# 4

Being a project manager ---  
---  
---  
Matrix?

Power / Interest Matrix (Gardner et al. (1988))

		Level of Interest	
		Low	High
Power	Low	A Minimal effort	B keep informed
	High	C keep satisfied	D key players

(14)

## Power / Interest Matrix:

### Stakeholders in group A:

Need only minimum effort and monitoring.

### Stakeholders in group B:

Should be kept informed as they may be able to influence more powerful stakeholders.

### Stakeholders in group C:

Are powerful, but level of interest is low. Generally expected to be passive but may move into group B as an issue of particular interest.

### Stakeholders in group D:

Are both powerful and their co-operation is of key importance for new strategies.

- a) Risk prevention
- b) impact mitigation
- c) risk transfer and insurance
- d) risk acceptance

(15)

Q # 5

For a project

checklist?

Checklist for risk management:

Stage 1

Initiation

- Assemble Risk management resources
- Appoint the team leader and ensure a breadth of skills / experience with the team.
- Assign Risk Management responsibilities appropriate to task

Stage 2

Proposal Familiarization

- Specify objectives and criteria
- Familiarise the team with the proposal, assemble documentation and define the key objectives.
- Assess the proposal in relation to the Agency's objectives and strategies
- Define key elements (target 20-50 elements, to items or activities) to structure risk analysis.



## Stage 3

## Risk Analysis

### • Identify risk

- Prepare a comprehensive schedule of risks for each element
- Describe each risk and list the main assumptions.

### • Assess risk like likelihoods and consequences

- Assemble data on risk and their consequences.
- Assess risk likelihoods
- Assess risk impacts.

### • Identify significant risks:

- Rank risks to reflect impacts and likelihoods
- Where applicable, estimate risk factors
- Discard / accept minor risks.
- Identify moderate risks for management measure.

### • Identify major risks for detailed risk action planning

## Stage 4

## Risk Response Planning

### • Identify feasible responses

- For each moderate and major risk, identify the feasible responses
- Responses may include:

- a) risk prevention
- b) impact mitigation
- c) risk transfer
- d) risk acceptance

### • Describe each feasible response and list main assumptions

- Select the best response
- Evaluate the benefits and costs for each response.
- Select the preferred response.

## Stage 5

## Reporting

- For designated proposals, produce the Risk Management plan
- For other projects collate and summarize risk action schedules and measures.

(18)

4.

3, 5

## Stage 6 Risk management implementation

- Implement measures and action strategies
  - Monitor the implementation
    - a) Assign responsibilities
    - b) Timing
  - Undertake periodic review and performance evaluation.
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