

Name Sajid Shahzada  
ID 7685  
Section C  
Department BE(civil)  
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Subject Construction Management

Submitted to = Dr. Engr. M Zeeshan Ahud



Q = No: 01

Given data: →

Number of Communication channels = 6

Additional Stake holders = 2

Required data:

Identify the number of Communication channels after increasing the Scope of work = ?

Solution:

As we know that

Number of Communication channel =  $\frac{n(n-1)}{2}$

The number of people involved in Six (6)

Communication channel:

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

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

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

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

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

$$(n-4) = 0$$

$$n = 4$$

$$n+3 = 0$$

$$n = -3$$

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

$$\text{Channel} = \frac{6(6-1)}{2} = \frac{30}{2} = 15$$

New Communication channel = 15  
Answer

====x====x====x====

$$\underline{\underline{Q = N = 0.2}}$$

Given data:

For a project of 10 package, for each planned value, Actual cost and percentage of Completion is given.

Required data:

Calculate

- Earned value
- Cost Variance
- Schedule Variance
- Cost Performance Index
- Schedule performance Index

Work package	BCWS		ACWP	% progress	BCWP		Cost Variance	Cost Performance Index	Schedule Performance Index
	PV (\$)	EV (\$)			EV (\$)	CV (\$)			
1	100,000	100,000	100,000	100	100,000	-20,000	0	0.83	1
2	100,000	110,000	100,000	100	100,000	-10,000	0	0.91	1
3	100,000	80,000	80,000	90	90,000	10,000	-10,000	1.13	0.9
4	100,000	125,000	80,000	80	80,000	-45,000	-20,000	0.64	0.8
5	100,000	75,000	50,000	50	50,000	-25,000	-50,000	0.67	0.5
6	100,000	0	0	0	0	0	-100,000	0	0
7	100,000	0	0	0	0	0	-100,000	0	0
8	100,000	0	0	0	0	0	-100,000	0	0
9	100,000	0	0	0	0	0	-100,000	0	0
10	100,000	0	0	0	0	0	-100,000	0	0

Cost and Performance Index

## Work package-4

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1) Earned value (EV):

$$EV = PV \times RP$$

$$EV = 10,00,000 \times 80\%$$

$$EV = 8,00,000$$

2) Cost variance:

$$CV = EV - AC$$

$$CV = 8,00,000 - 1,25,000$$

$$CV = -45,000\$$$

3) Schedule variance:

$$SV = EV - PV$$

$$SV = 8,00,000 - 10,00,000$$

$$SV = -2,00,000\$$$

4) Cost performance index: CPI

$$CPI = \frac{EV}{AV} = \frac{8,00,000}{1,25,000}$$

5) Schedule performance index: SPI

$$SPI = \frac{EV}{PV} = \frac{8,00,000}{10,00,000} = 0.8$$

Conclusion:

~~The project is over budgeted~~

Work package - 5

{6}

(1) EV

$$EV = PV \times RP$$

$$EV = 100,000 \times 50\%$$

$$EV = 50,000 \$$$

(2) Cost Variance: CV

$$CV = EV - AC$$

$$CV = 50,000 - 75,000$$

$$CV = -25,000 \$$$

(3) Schedule Variance: SV

$$SV = EV - PV$$

$$SV = 50,000 - 100,000$$

$$SV = -50,000 \$$$

(4) Cost performance Index:

$$CPI = EV/AC = \frac{50,000}{75,000} = 0.67$$

$$\boxed{CPI = 0.67}$$

(5) SPI

$$SPI = EV/PV = \frac{50,000}{100,000} = 0.5$$

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Work package = 6

(1) Earned value = EV

$$EV = PV \times RP$$

$$EV = 100,000 \times 0\%$$

$$EV = 0$$

(2) Cost Variance (CV)

$$CV = EV - AC$$

$$CV = 0 - 0$$

$$CV = 0$$

(3) Schedule Variance: SV

$$SV = EV - PV$$

$$SV = 0 - 100,000$$

$$SV = -100,000$$

(4) Cost performance Index: CPI:

$$CPI = EV / AC = 0\%$$

(5) Schedule performance Index SPI

$$SPI = \frac{EV}{PV} = \frac{0}{100,000} = 0$$



Comments:

On the basis of CPI:

According to Thumb Rules;

- Workpackage 1, 2, 4 and 5 are over budget because CPI value is less than 100%.
- Work package 3 is under budget because CPI value is greater than 100%.

On the basis of SPI:

According to Thumb Rules:

- Work package 1 and 2 are on the Schedule.
- Work package 3, 4 and 5 are behind Schedule.

Q3

$$\underline{\underline{Q = N_0 = 03}}$$

Given data:

$$\text{Initial Investment} = 9000 \$$$

$$\text{Discount Rate} = r = 10\% = \frac{10}{100} = 0.1$$

Cash Flow

$$C_1 = 2,000 \$$$

$$C_2 = 3,000 \$$$

$$C_3 = 3,000 \$$$

$$C_4 = 4,000 \$$$

Required data:

$$\text{Net present value} = \text{NPV} = ?$$

Solution:

As we know that

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

$$PV_0 = -9,000.00$$

$$PV_1 = \frac{C_1}{1+r} = \frac{2000}{1+0.1} = 1,818.18$$

$$PV_2 = \frac{C_2}{(1+r)^2} = \frac{3,000}{(1+0.1)^2} = 2,479.34$$

$$PV_3 = \frac{C_3}{(1+r)^3} = \frac{3,000}{(1+0.1)^3} = 2,253.94$$

$$PV_4 = \frac{C_4}{(1+r)^4} = \frac{4,000}{(1+0.1)^4} = 2,732.05$$

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0.11.04

~~2732.05~~

putting value in equation (1)

$$NPV = -9,000 + 1,818.18 + 2,479.34 + 2,253.94 + 2,732.05$$

$$NPV = \$283.51$$

### Conclusion:

A positive NPV means the Combined PV of all Cash Inflows exceeds the PV of Cash outflows.

→ The NPV of \$283.51 suggest that the Combined PV of all Cash Inflows exceeds the PV of Cash outflows by \$283.51

X=====X=====X=====X

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Q=No=04

Solution

The power/ Interest Matrix:

- Classifies stakeholders in relation to their power and the extent to which they are likely to show interest in the actions of the organisation.
- Can be used to indicate the nature of the relationship which should be adopted with each group.

		Level of Interest	
		Low	High
Power	Low	A Minimal effort	B Key informed
	High	C Keep satisfied	D Key players

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 D on an issue of particular interest.

Q = No = 05

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# CHECKLIST FOR RISK MANAGEMENT

⇒ Stage-1: Initiation

- \* Assemble Risk Management resources
- \* Appoint the team leader and ensure a breadth of skills/experience within the team.
- \* Assign Risk Management responsibilities appropriate to tasks

⇒ 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
- \* Determine assessment criteria for proposal
- \* Define key elements (target 20-50 elements, items or activities) to structure risk analysis.

## Stage 3 Risk Analysis {13} {13}

⇒ Identify risks:

- \* prepare a Comprehensive Schedule of risk for each element.
- \* Describe each risk and list the main assumptions.

⇒ Assess risk likelihoods and Consequences

- \* Assemble ~~with~~ data on risk and their Consequences
- \* Assess risk likelihood
- \* 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 measures.

⇒ 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

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b) impact mitigation

c) risk transfer and insurance

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.

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End