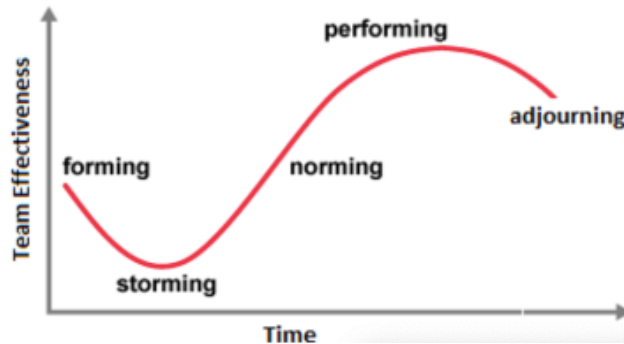


Lecture 7:

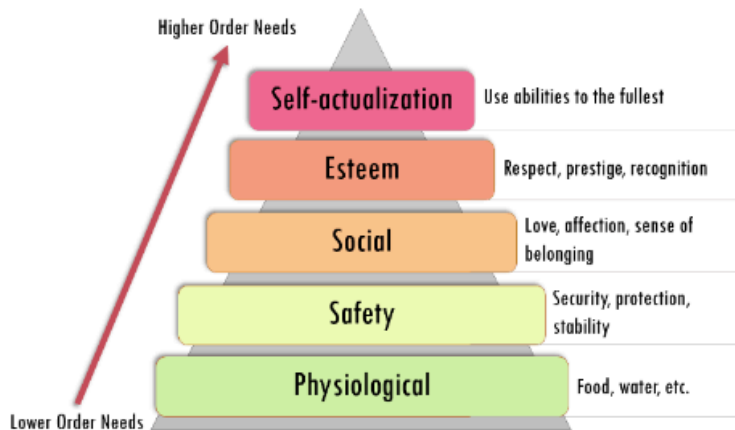
Stages of Team Development:

- ✓ According to the Psychologist Bruce Tuckman, there are 5 stages in team development:

1. Forming
2. Storming
3. Norming
4. Performing
5. Adjourning



Maslow's hierarchy of need:



People will not be interested at a particular level of needs unless their lower-level needs were fulfilled.

McGregor's Theory X and Theory Y:

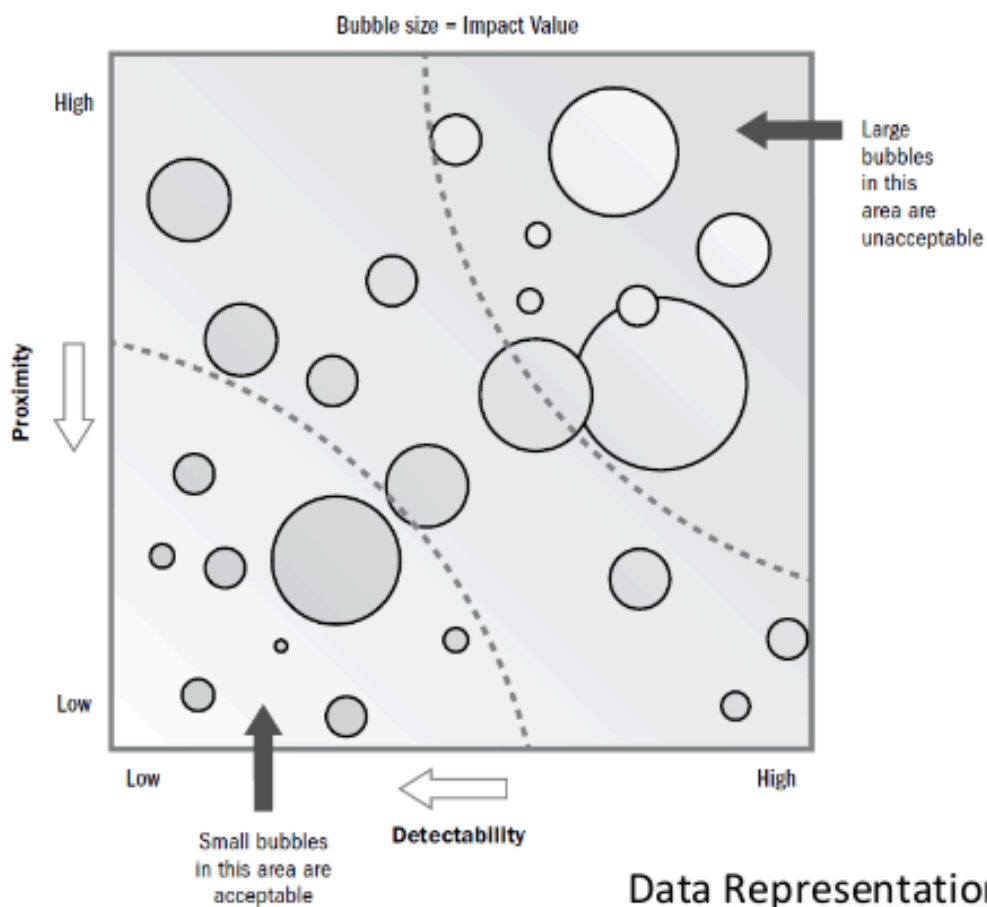
- ✓ Douglas McGregor proposed two contrasting theories about management styles, authoritarian (Theory X) and participative (Theory Y)
- ✓ Theory X manager believe, most of the people do not like to work. They believe in constant supervision..
- ✓ Managers believe, people are interested to work their best if they are given right motivation



Which process involve most of the conflicts:

Process Group	process
Initiating	Develop Project Charter
Planning	Develop Project Management Plan
Execution	Develop Team
	Manage Team
	Manage Stakeholder Engagement
	Manage Communications

Lecture -6:



PERFORM QUANTITATIVE RISK ANALYSIS



Your team has identified three risks with probabilities of 10%, 50%, and 35% during risk management planning. If the first two risks occur, they will cost you 5,000 USD and 8,000 USD; however, the third risk will give you 10,000 USD if it occurs.

Determine the expected monetary value of these risk events.

$$\begin{aligned} \text{The expected monetary value (EMV) of three events} &= \text{EMV of first event} + \text{EMV of second event} + \text{EMV of third event} \\ &= 0.10 * (-5,000) + 0.50 * (-8,000) + 0.35 * 10,000 \\ &= -1,000 \end{aligned}$$

Vendor A has a 50% probability of being on-time, a 30% probability of being late at an additional cost of \$40,000 and a 20% probability of delivering early at a savings of \$20,000. Vendor B has a 30% probability of being on-time, a 40% probability of being late at an additional cost of \$40,000 and a 30% probability of delivering early at a savings of \$20,000. Which vendor to chose ?

PLAN RISK RESPONSE



Tools & Techniques:

- Strategies for threats

- ✓ Avoid
- ✓ Mitigate
- ✓ Transfer
- ✓ accept

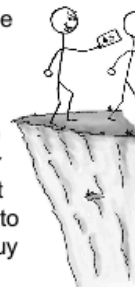
avoid it—if you can prevent it from happening, it definitely won't hurt your project.



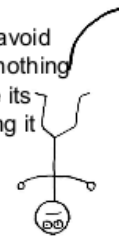
Mitigate - If you can't avoid the risk, you can mitigate it. This means taking some sort of action that will cause it to do as little damage to your project as possible.



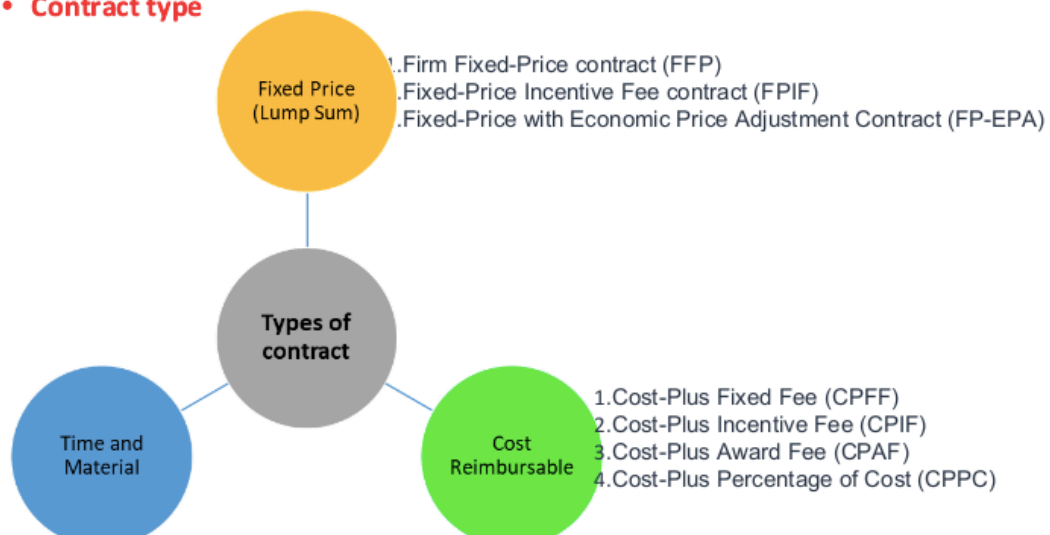
Transfer - One effective way to deal with a risk is to pay someone else to accept it for you. The most common way to do this is to buy insurance.



Accept - If you can't avoid the risk, and there's nothing you can do to reduce its impact, then accepting it is your only choice.



Input: • **Contract type**



Fixed Price Contracts, a Fixed Amount of consideration is required to be paid by the Buyer to the Seller for the Specified Work.

Firm Fixed Price (FFP): The seller must complete the job or supply the product or service within an agreed amount of time and at a set price.

Fixed Price Incentive Fee (FPIF): Identical to a FFP contract except that the seller may receive an additional monetary incentive if they perform well – for example, completing the project ahead of schedule.

Fixed Price with Economic Price Adjustment (FP-EPA): Used in multi-year agreements to protect the seller from inflation – for example, costs will increase 3% after a certain amount of time.

Cost Plus Fixed Fees Contract (CPFF)

the seller is paid for all incurred costs plus a fixed fee, regardless of their performance. The buyer bears the risk. CPFF contracts keep the seller safe from risks.

Example: Total cost plus 25,000 USD as a fee.

Cost Plus Incentive Fees Contract (CPIF)

the seller will be reimbursed for all costs plus an incentive fee based upon achieving certain performance objectives mentioned in the contract. the risk lies with the buyer; however, it is lower than in the Cost-Plus Fixed Fee. In a CPIF contract, the incentive is a motivating factor for the seller. Generally, an incentive is a percentage of the savings that buyer and seller share.

Example: If the project is completed under budget, the seller will receive 25% of the savings.

Cost Plus Award Fee Contracts (CPAF)

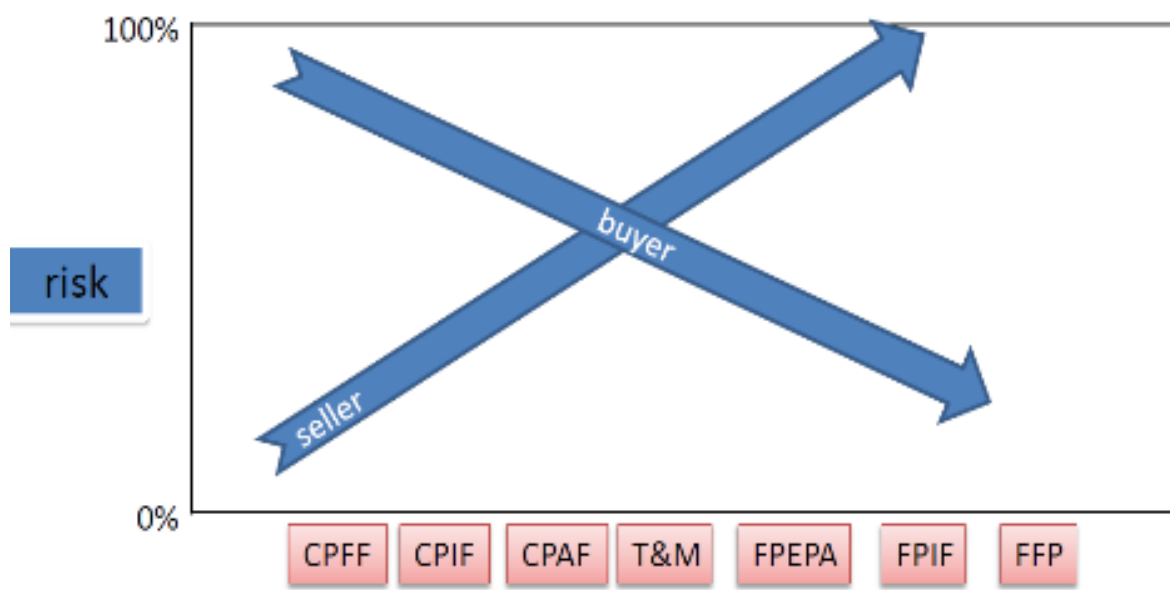
the seller is paid for their costs plus an award fee. This extra will be based on achieving satisfaction according to specified performance objectives described in the contract.

Example: If the seller completes the task by meeting or exceeding quality standards based on their performance, the buyer may give an award of up to 10,000 USD.

Cost Plus Percentage of Cost (CPPC)

Here, the seller is paid for all costs incurred, plus a percentage of these costs. Buyers often do not prefer this type of contract because the seller might artificially increase the costs to earn a higher profit.

Example: Total cost plus 15% of the cost as a fee to the contractor.



Formulas for Incentive Calculations

Price = Cost + Fee

Cost Variance = (Target Cost) – (Actual Cost)

Buyer's Share = (Cost Variance) * (Buyer's Share Ratio)

Seller's Share = (Cost Variance) * (Seller's Share Ratio)

Fee = (Target Fee) + (Seller's Share)

Target Price = (Target Cost) + (Target Fee)

INCENTIVE CALCULATION



Let us assume that following data given to us.

Target Cost = 100K **Target Fee** = \$20K

Ceiling Price = \$130K **Share Ratio** = 50:50

We can conclude that

Target Price = \$100K + \$20K = \$120K

Let us consider a scenarios and calculate the Price.

Actual Cost is less than the Target Cost **Actual Cost** = \$90K

Cost Variance = \$100K – \$90K = \$10K , The seller has saved \$10K below the Target Cost.

Seller's Share = 10*50% = \$5K

Fee = \$20K + \$5K = \$25K

Price = \$90K + \$25K = \$115K

Price = Cost + Fee

Cost Variance = (Target Cost) – (Actual Cost)

Buyer's Share = (Cost Variance) * (Buyer's Share Ratio)

Seller's Share = (Cost Variance) * (Seller's Share Ratio)

Fee = (Target Fee) + (Seller's Share)

Target Price = (Target Cost) + (Target Fee)

The buyer will pay \$115K to the Seller which is less than Target Price (\$120K). The seller will receive \$25K as Fee, which is more than the Target Fee (\$20K). Both the buyer and the seller get the benefit of cost saving.

INCENTIVE CALCULATION



Let us assume that following data given to us.

Target Cost = 100K **Target Fee** = \$20K

Ceiling Price = \$130K **Share Ratio** = 50:50

We can conclude that

Target Price = \$100K + \$20K = \$120K

Let us consider another scenarios and calculate the Price.

Actual Cost is less than the Target Cost **Actual Cost** = \$110K

Cost Variance = \$100K – \$110K = -\$10K , seller has spent \$10K more than the Target Cost.

Seller's Share = -10*50% = -\$5K

Fee = \$20K - \$5K = \$15K

Price = \$110K + \$15K = \$125K

Price = Cost + Fee

Cost Variance = (Target Cost) – (Actual Cost)

Buyer's Share = (Cost Variance) * (Buyer's Share Ratio)

Seller's Share = (Cost Variance) * (Seller's Share Ratio)

Fee = (Target Fee) + (Seller's Share)

Target Price = (Target Cost) + (Target Fee)

The buyer will pay \$125K to the Seller which is more than the Target Price (\$120K). The seller will receive \$15K as Fee, which is less than the Target Fee (\$20K). Both the buyer and the seller are at a disadvantage.

POINT OF TOTAL ASSUMPTION(PTA)

From the example, we already know two things. At PTA

1. **AC** will be equal to **PTA**
2. the buyer will pay **CP** to the seller

We already know that

price = cost+ fee

So for PTA it will be $CP = PTA + Fee$

$$CP = PTA + [TF + (TC - AC) * SR]$$

In our case, AC is PTA. Replacing AC with PTA we get

$$CP = PTA + [TF + (TC - PTA) * SR]$$

$$CP = PTA + [TF + (TC - PTA) * (1 - BR)]$$

$$CP = PTA + TF + TC - TC * BR - PTA + PTA * BR$$

$$CP = (PTA * BR - TC * BR) + (TF + TC)$$

$$CP = (PTA - TC) * BR + TP$$

$$PTA = (Ceiling Price - Target Price) / Buyer's Share Ratio + Target Cost$$

POINT OF TOTAL ASSUMPTION(PTA)



The Point of Total Assumption is the point above which the seller starts assuming the cost of the contracted work.

Let us use the previous example to understand PTA

Target Cost = 100K **Target Fee** = \$20K

Ceiling Price = \$130K **Share Ratio** = 50:50

Target Price = \$100K + \$20K = \$120K

Let us look at a particular scenario when **Actual Cost**=\$120K. Let us calculate the **Actual Price**.

Cost Variance = \$100K – \$120K = -\$20K, seller has spent \$20K more than the Target Cost.

Seller's Share = (-20)*50% = -\$10K

Fee = \$20K – \$10K = \$10K

Price = \$120K + \$10K = \$130K

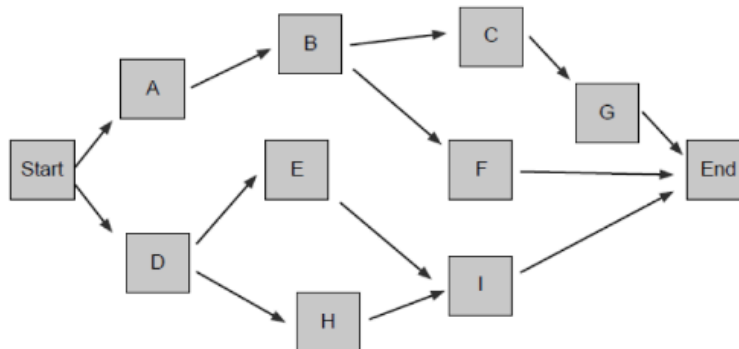
The buyer will pay \$130K to the Seller, which is also the **Ceiling Price**. The price is capped at \$130K. So, if the seller spends anything more than \$120K, the extra cost will have to be borne by the seller. For our example, **PTA is \$120K**.

Lecture 5:



Tools & Techniques: precedence diagramming method (PDM)

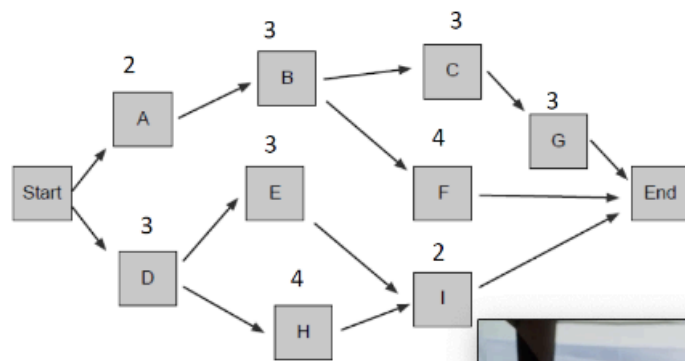
- ✓ is a technique used for constructing a schedule model in which activities are represented by nodes and are graphically linked by one or more logical relationships to show the sequence in which the activities are to be



Name	Predecessor
Start	-
A	Start
B	A
C	B
D	Start
E	D
F	B
G	C
H	D
I	E, H
End	F, G, H

Tools & Techniques: Critical Path Method

Name	Predecessor
Start	—
A	Start
B	A
C	B
D	Start
E	D
F	B
G	C
H	D
I	E, H
Finish	F, G, I



Two commonly used formulas are triangular and beta distributions. The formulas are:

- Triangular distribution. $cE = (cO + cM + cP) / 3$
- Beta distribution. $cE = (cO + 4cM + cP) / 6$

PERT (Program Evaluation and Review Technique) is based on beta distribution technique and uses an approximate formula to calculate weighted average of three numbers.

$$E_{PERT} = (cO + 4cM + cP) / 6$$

Why is 4 weights to cM in the PERT Formula?

PERT was initially developed by US Navy to take care of scheduling uncertainties. The formula mentioned above is a close approximation of mean found by the beta distribution equation.

PERT Example and explanation

Let us assume that we have to estimate the time it takes to go from IUT to Uttara. There could be 3 different scenario for going from IUT to Uttara.

Optimistic Scenario – Roads would be free of any traffic congestion and there is likely to be no stopping at traffic signals.

Pessimistic Scenario – There would be serious traffic bottlenecks (may be due to a major accident/Bridge Collapse/) or there would be some unscheduled stops (may be due to vehicle breakdown).

Most Likely Scenario – There would be regular traffic conditions.

Let us assume that we evaluated the three scenarios and arrived at 3 estimates:

Optimistic Value (cO): 45 minutes

Pessimistic Value (cP): 225 minutes

Most Likely Value (cM): 90 minutes

Putting these values in the formula, we get

$$E_PERT = (45 + 225 + 4 \times 90) / 6 = 105 \text{ minutes}$$

PERT with Standard Deviation

The Standard Deviation for PERT can be calculated by using the following formula:

$$\sigma = (cP - cO) / 6 \quad \sigma = (225 - 45) / 6 \quad \sigma = 30 \text{ minutes}$$

in most cases, the trip will take 105 minutes or less.

what is the Probability of reaching Uttara from IUT in 105 minutes?

Standard Deviation shows the Variation from the Mean. A low Standard Deviation indicates that the observations (series of numbers) are very close to the Mean.

Consider the following two series:

Series A: (5, 6, 7) Series B: (2, 6, 10)

The mean (simple average) of both the series is 6. However, numbers in the series B are far apart as compared to Series A.

High quality, high grade

It's cooked correctly and safe to eat (high quality), and it uses a high grade of meat and other ingredients that make it desirable

Low quality, high grade

good ingredients (high grade). However, the burger arrives burnt and inedible! Although the grade is high, the quality is low.



High quality, low grade

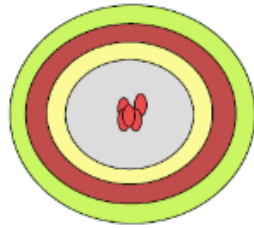
cooked correctly and safe to eat (high quality), but it might use low-grade meat or have unhealthy ingredients that make it less desirable (low grade).

Low quality, low grade

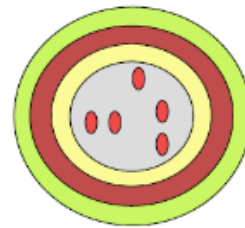
burger arrives burnt and inedible (low quality) with low-grade meat or have unhealthy ingredients that make it less desirable (low grade).

PLAN QUALITY

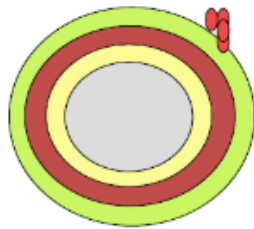
Precision vs. accuracy



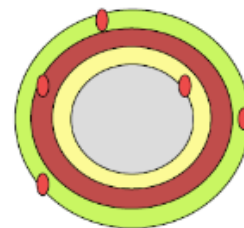
Accurate & Precise



Accurate, but not Precise



Precise, but not Accurate



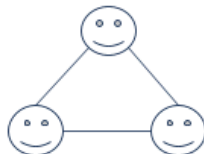
Not Accurate, not Precise

Tools & Techniques: Communication requirement analysis

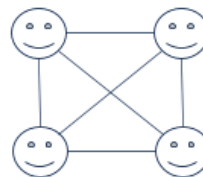
- ✓ Analysis of communication requirements determines the information needs of the project stakeholders.
- ✓ These requirements are defined by combining the type and format of information needed with an analysis of the value of that information.



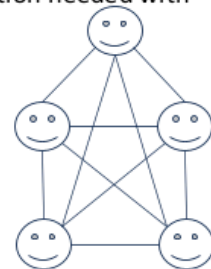
Two People
One Channel



Three People
Three Channel



Four People
Six Channel



Five People
Ten Channel

For n number of persons, Number of Communication Channels = $n(n-1)/2$

PROJECT SELECTION



Time Value of Money Formula

Present Value:

$$PV = FV / (1+r)^n \quad r \text{ is the interest rate \& n is duration}$$

Suppose you have been promised by someone that he will give you 10,000.00 \$, 5 year from today and interest rate is 8%. we want to know what the present value of 10,000.00 \$ which you will receive in future

$$PV = 10,000 / (1+0.08)^5$$

$$PV = 6805.83 \text{ (To the nearest Decimal)}$$

So present-day value of \$10,000.00 is \$6805.83

Future Value:

$$FV = PV * (1+r)^n$$

PROJECT SELECTION



Return on investment (ROI)

- ✓ ROI determines the potential profitability of an investment by calculating the benefits received in relation to the cost

$$\text{Return on Investment Ratio} = (\text{Net Return} / \text{Cost of Investment}) * 100$$

- ✓ ROI measure is used for knowing the potential earnings of an investment.
- ✓ ROI is always expressed in a percentage form

Example

A person wants to invest in the shares of a company. He purchased 100 shares at the price of \$500 each and after sometime purchased 100 shares again of the same company at the price of \$550 per share. After a few years, it sold all the 200 shares at the price of \$600 per share. Calculate the return on investment ratio of the person.

$$\text{Cost of Investment} = \text{Purchase Price} * \text{Quantity Purchased} = \$500 * 100 + \$550 * 100 = \$105,000$$

$$\text{Net Return} = \text{Sales Value of Investment} - \text{Cost of Investment} = (200 * \$600) - \$105,000 = \$15,000$$

$$\text{Return on Investment Ratio} = (\text{Net Return} / \text{Cost of Investment}) * 100 = (\$15,000 / \$105,000) * 100 = 14.29\%$$

PROJECT SELECTION



Net Present Value (NPV):

- ✓ Net present value is the present value of the cash flows at the required rate of return of your project compared to your initial investment,
- ✓ NPV considers the time value of money, translating future cash flows into today's dollars.
- ✓ Formula For the Net Present Value is given below:

$$\text{NPV} = \sum (CF_n / (1 + i)^n) - \text{Initial Investment}$$

Where,

n = Period which takes values from 0 to the n th period till the cash flows ends

CF_n = Cash flow in the n^{th} period

i = Discounting rate/interest rate

- ✓ In practical, NPV a method of calculating your return on investment for a project or expenditure.
- ✓ Based on the results of the Net Present Value, a company may decide on investing in one project and rejecting another.

PROJECT SELECTION



Net Present Value(NPV):

Assuming the initial cash flow is \$10,000 invested for a project and subsequent cash flows for each year for 5 years is \$3,000. The discount rate is assumed to be 10%. Calculate Net Present Value.

$$\text{NPV} = \sum (CF_n / (1 + i)^n) - \text{Initial Investment}$$

PV

$$PV_1 = FV_1 / (1+r)^n = 3000 / (1+0.1)^1 = 2727.27$$

$$PV_2 = FV_2 / (1+r)^n = 3000 / (1+0.1)^2 = 2479.34$$

$$PV_3 = FV_3 / (1+r)^n = 3000 / (1+0.1)^3 = 2253.94$$

$$PV_4 = FV_4 / (1+r)^n = 3000 / (1+0.1)^4 = 2049.04$$

$$PV_5 = FV_5 / (1+r)^n = 3000 / (1+0.1)^5 = 1862.76$$

$$\text{NPV} = \sum (CF_n / (1 + i)^n) - \text{Initial Investment} = (\$2,727.27 + \$2,479.34 + \$2,253.94 + \$2,049.04 + \$1,862.76) - \$10,000 = \$1372.36$$

PROJECT SELECTION



Net Present Value (NPV):

General Electric has the opportunity to invest in 2 projects. Project A requires an investment of \$1000000 which will give a return of \$300000 each year for 5 years. Project B requires an investment of \$750000 which will give a return of \$100000, \$150000, \$200000, \$250000 and \$ 250000 for the next 5 years. Then Calculate the Net Present Value which can be used to decide which opportunity is better and should be invested in.

Calculate the NPV for Project A
Calculate the NPV for Project B
Chose the project with bigger NPV

PROJECT SELECTION



Internal rate of return(IRR):

- ✓ Internal Rate of Return is the interest rate that makes the Net Present Value zero.
- ✓ is usually used to calculate the profitability of investments made in a financial product or projects
- ✓ For project selection go with larger IRR

Payback Period:

- ✓ The payback period is the time required to recover the cost of total investment meant into a business.
- ✓ is used for taking decisions whether a particular project will be taken by the organization or not.
- ✓ In simple terms, management looks for a lower payback period.

$$\text{Payback Period} = \frac{\text{Initial Investment or Original Cost of the Asset}}{\text{Cash Inflows}}$$

8 lect

Earned value analysis (EVA)

- ✓ basic terms/values of EVA:
 - Budget At Completion (BAC)
 - is the Estimated (or Planned or Budgeted) Cost required to complete the Entire Work
 - Planned Value (PV) -
 - Monetary Value of the Work that was Planned (Estimated) to be Completed by the Control Date.
 - Earned Value (EV)
 - Monetary Value of the Work that was Actually Completed by the Control Date. It is NOT the Cost of Work completed. Rather it is the value of the Work completed as per the original Budget.
 - Actual Cost (AC)
 - is the Cost of Work that was Actually Completed by the Control Date.

Earned value analysis (EVA)

- Schedule Variance (SV)
 - is the difference between the monetary value of Work that was Actually Completed and the monetary value of Work that was Planned to be Completed. $(SV) = EV - PV$
- Cost Variance (CV)
 - is the difference between the monetary value of Work that was Actually Completed and the Cost of Work that was Actually Completed. $(CV) = EV - AC$
- Schedule Performance Index (SPI)
 - is the ratio of the monetary value of Work that was Actually Completed and the monetary value of Work that was Planned to be Completed. $(SPI) = EV/PV$
- Cost Performance Index (CPI)
 - is the ratio of the monetary value of Work that was Actually Completed and the Cost of Work that was Actually Completed. $(CPI) = EV/AC$



Earned value analysis (EVA)

- Estimate To Complete (ETC)
 - is the Estimated Cost of the Remaining Work (Work that is remaining on the Control Date). Or simply, it is the money required to complete the Remaining Work.
- Estimate At Completion (EAC)
 - is the Revised Estimated Budget for the Entire Work. The Original Budget was estimated as BAC. But on the Control Date Project may have a Cost Variance (CV). Due to the Cost Variance, Original Budget (BAC) may no longer be valid. The original budget may need to be adjusted. EAC is the Adjusted (or Proposed or Revised) Budget.
- To Complete Performance Index (TCPI)
 - is the Projected Future Cost Efficiency to complete the project within Approved Budget. CPI is the Actual Efficiency of the project till the Control Date whereas TCPI is the Projected Future Efficiency to complete the remaining work.

Earned value analysis (EVA)

The project team needs to build 80 wooden tables in 5 days. It is estimated that each table will cost 1000 units of money.

	Day 1	Day 2	Day 3	Day 4	Day 5
Tables Planned to be Built	10	13	17	20	20
Estimated Cost for the Day	10000	13000	17000	20000	20000
Estimated Cumulative Cost	10000	23000	40000	60000	80000
Tables Actually Built	8	12	15		
Value of Tables Actually Built	8000	12000	15000		
Cumulative Value of Tables Actually Built	8000	20000	35000		
Actual Cost for the Day	8000	12000	16000		
Actual Cumulative Cost	8000	20000	36000		

$EV = 35 * 1000 = 35000$
 $PV = 40 * 1000 = 40000$
 $AC = 36000$

What can we say:

1. The project is behind schedule.
 - had planned to build 40 tables at the end of Day 3 but build 35 tables.
2. The project is Over Budget.
 - 36000 units of money was spent for doing the work that was worth 35000 units of money.

CONTROL COST

Earned value analysis (EVA)

	Day 1	Day 2	Day 3	Day 4	Day 5
Tables Planned to be Built	10	13	17	20	20
Estimated Cost for the Day	10000	13000	17000	20000	20000
Estimated Cumulative Cost	10000	23000	40000	60000	80000
Tables Actually Built	8	12	15		
Value of Tables Actually Built	8000	12000	15000		
Cumulative Value of Tables Actually Built	8000	20000	35000		
Actual Cost for the Day	8000	12000	16000		
Actual Cumulative Cost	8000	20000	36000		

Schedule Variance (SV) = EV – PV

Cost Variance (CV) = EV – AC

Schedule Performance Index (SPI) = EV/PV

Cost Performance Index (CPI) = EV/AC

SV = 35000 – 40000 = -5000

CV = 35000 – 36000 = -1000

SPI = 35000 / 40000 = 0.875

CPI = 35000 / 36000 = 0.97

Findings:

- ✓ Negative variance means Project is behind. BAD
- ✓ Positive variance means Project is ahead. GOOD
- ✓ Performance Index less than 1 means Project is behind. BAD
- ✓ Performance Index greater than 1 means Project is ahead. GOOD

CONTROL COST

Estimate To Complete (ETC) Formulas

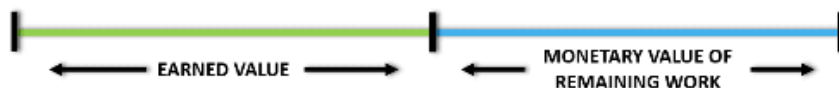
ETC is an estimated cost of remaining work.



TOTAL PROJECT SCOPE/WORK

Remaining Work = Total Work – Completed Work

next step is to find the MV of remaining work.



ORIGINAL PROJECT BUDGET (BAC)

MV of Remaining Work = BAC – EV

CONTROL COST



Estimate To Complete (ETC)

	Day 1	Day 2	Day 3	Day 4	Day 5
Tables Planned to be Built	10	13	17	20	20
Estimated Cost for the Day	10000	13000	17000	20000	20000
Estimated Cumulative Cost	10000	23000	40000	60000	80000
Tables Actually Built	8	12	15		
Value of Tables Actually Built	8000	12000	15000		
Cumulative Value of Tables Actually Built	8000	20000	35000		
Actual Cost for the Day	8000	12000	16000		
Actual Cumulative Cost	8000	20000	36000		

BAC is 80000.

EV is 35000.

MV of the remaining work is 45000.

Actual Cost (AC) is 36000.

Now, we have to find the expected cost of performing work that is worth 45000 units of money.

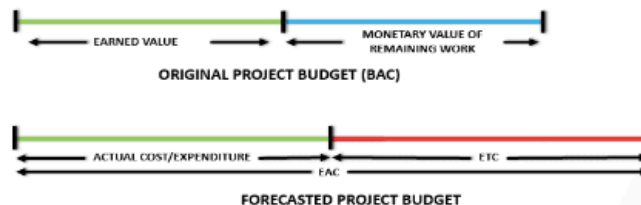
we know that the work that was worth 35000 units of money was completed in 36000 units of money. So, mathematically (by using ratio and proportion), we can say that work that is worth 45000 units of money should require:

$45000 \times \frac{36000}{35000}$ or 46286 units of money.

EV/AC

$$ETC = (\text{MV of remaining work}) / (\text{Cost Performance Index})$$

To Complete Performance Index (TCPI)



$$TCPI = (\text{monetary value of remaining work}) / (\text{remaining funds})$$

Numerator

monetary value of *remaining work* = monetary value of *total work* – monetary value of *completed work*

monetary value of *remaining work* = BAC – EV

Denominator

remaining funds = *total project budget* – *actual expenditure*

remaining funds = *total project budget* – AC

Final Equation

$$TCPI = (BAC - EV) / (BAC - AC)$$

CONTROL COST



To Complete Performance Index (TCPI)

	Day 1	Day 2	Day 3	Day 4	Day 5
Tables Planned to be Built	10	13	17	20	20
Estimated Cost for the Day	10000	13000	17000	20000	20000
Estimated Cumulative Cost	10000	23000	40000	60000	80000
Tables Actually Built	8	12	15		
Value of Tables Actually Built	8000	12000	15000		
Cumulative Value of Tables Actually Built	8000	20000	35000		
Actual Cost for the Day	8000	12000	16000		
Actual Cumulative Cost	8000	20000	36000		

BAC is 80000.

EV is 35000.

Actual Cost (AC) is 36000.

If the project has to be completed within the original budget (BAC), then we can replace *total project budget* with BAC.

$$TCPI_B = (80000 - 35000) / (80000 - 36000) = 1.02$$

If the project has to be completed within the revised budget (EAC), then we can replace *total project budget* in the Generic Equation with EAC. The equation reduces to:

$$TCPI_E = (BAC - EV) / (EAC - AC)$$

Consider Sponsor has imposed a revised budget (EAC) of 78000

$$TCPI_E = (80000 - 35000) / (78000 - 36000) = 1.07$$

To Complete Performance Index (TCPI)

TCPI < 1 – it means that project has more funds and less work. It is easier to complete the project.

TCPI = 1 – it means that project has just enough funds to complete the work.

TCPI > 1 – it means that project has less funds and more work. It is difficult to complete the project.

Difference Between CPI And TCPI

CPI = (monetary value of *completed work*)/(*expenditure till control date*)

TCPI = (monetary value of *remaining work*)/(*remaining funds*)

CPI < 1 – it means that value earned value is less than the money spent. Project is over budget.

CPI = 1 – it means that value earned value is equal to the money spent. Project is going as per the budget.

CPI > 1 – it means that value earned value is more than the money spent. Project is under budget.

