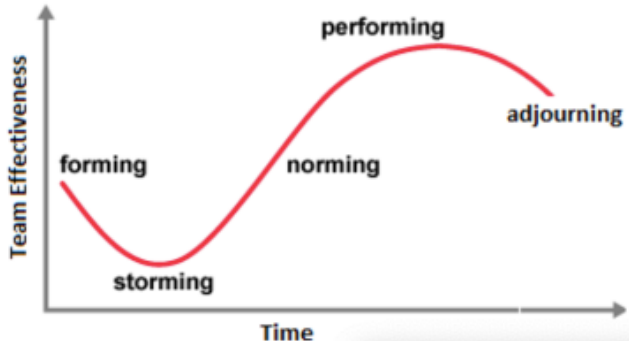
Lecture 7:

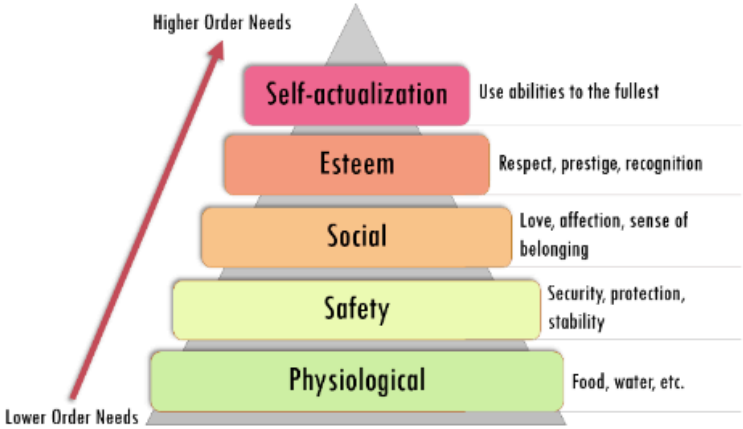
Stages of Team Development:

✔ 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:



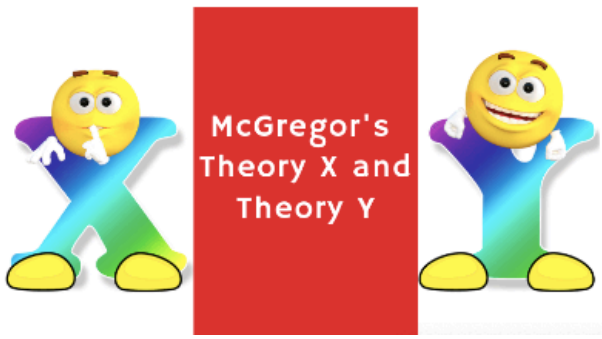
People will not be interested at a particular level of needs unless their lower-level needs were fulfilled.

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..

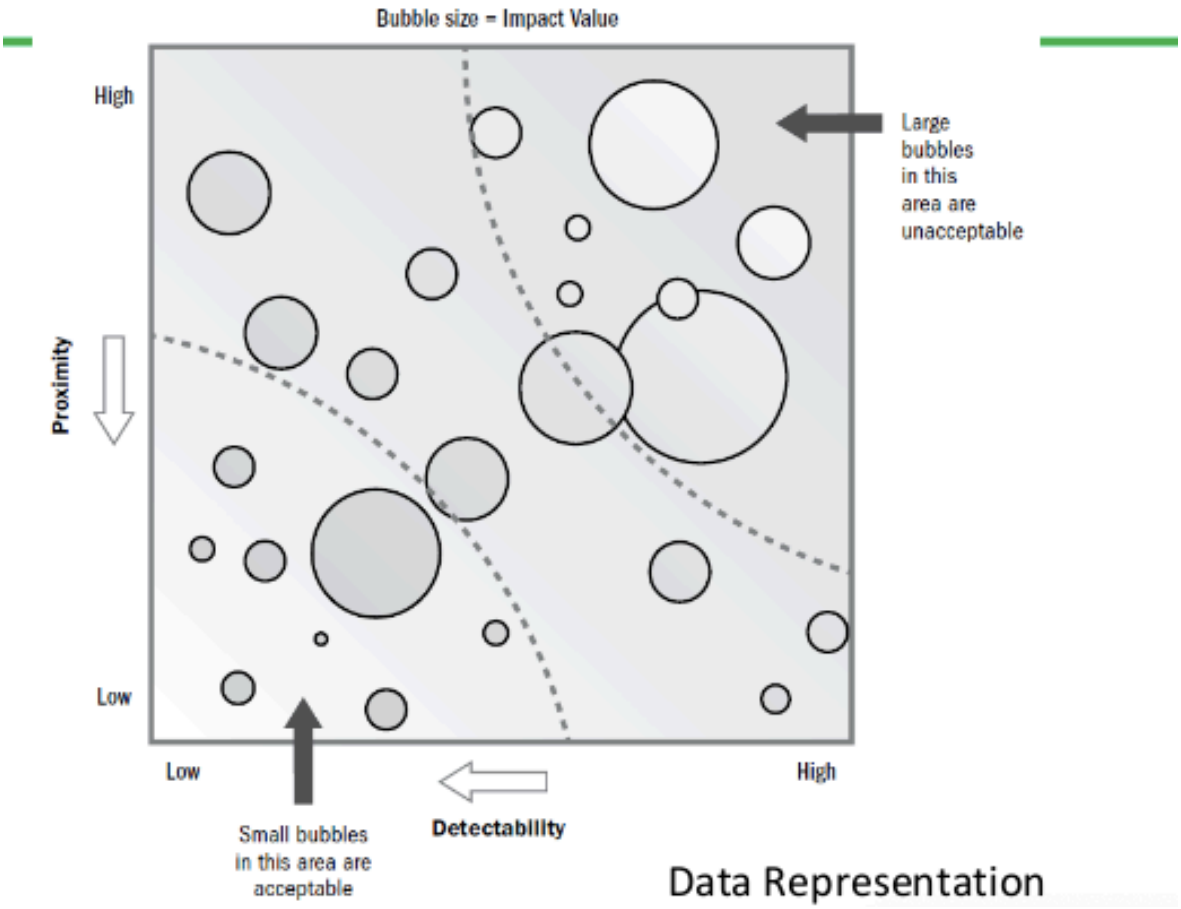
✔ Managers believe, people are interested to work their best if they are given right motivation



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.

The expected monetary value (EMV) of three events = EMV of first event + EMV of second event + EMV of third event
= 0.10 * (–5,000) + 0.50 * (–8,000) + 0.35 * 10,000
= –1,000

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 ?

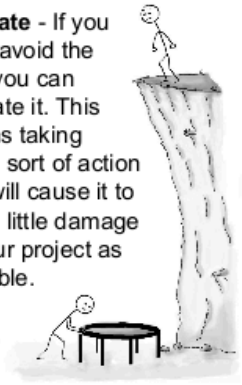
PLAN RISK RESPONSE

Tools & Techniques:

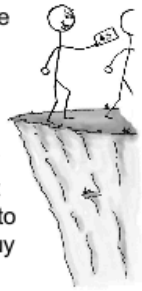
- **Strategies for threats**
  - ✔ **Avoid**
  - ✔ **Mitigate**
  - ✔ **Transfer**
  - ✔ **accept**

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

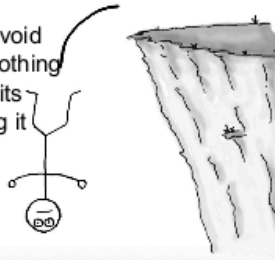
Mitigate - If you can't avoid the risk, you can mitigate it. This means taking some sort of action that will cause it to do as little damage to your project as possible.



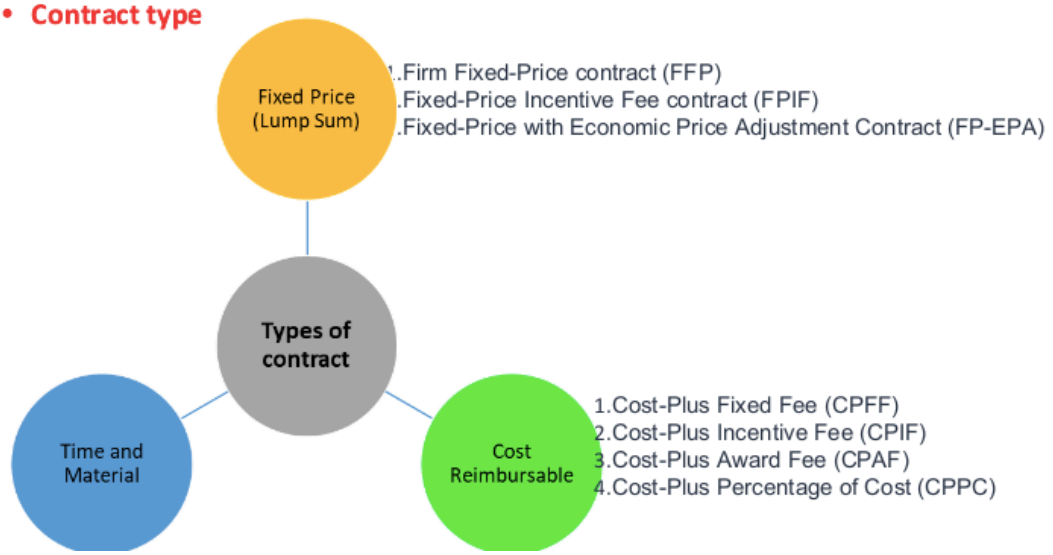
Transfer - One effective way to deal with a risk is to pay someone else to accept it for you. The most common way to do this is to buy insurance.



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)

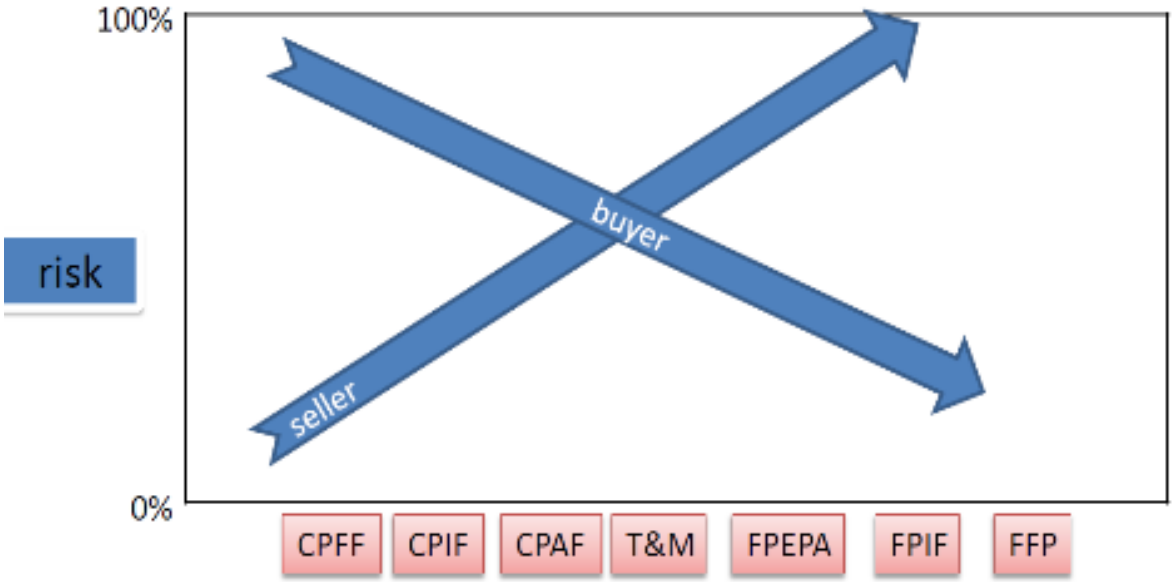
the seller will be reimbursed for all costs plus an incentive fee based upon achieving certain performance objectives mentioned in the contract. the risk lies with the buyer; however, it is lower than in the Cost-Plus Fixed Fee. In a CPIF contract, the incentive is a motivating factor for the seller.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

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)

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

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

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)

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

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:

SEQUENCE ACTIVITIES

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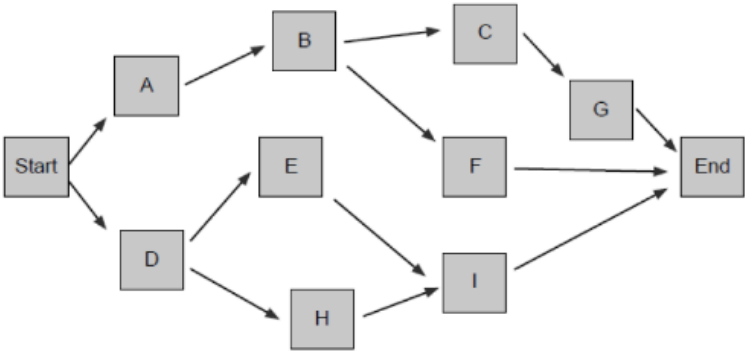
Tools & Techniques: precedence diagramming method (PDM)

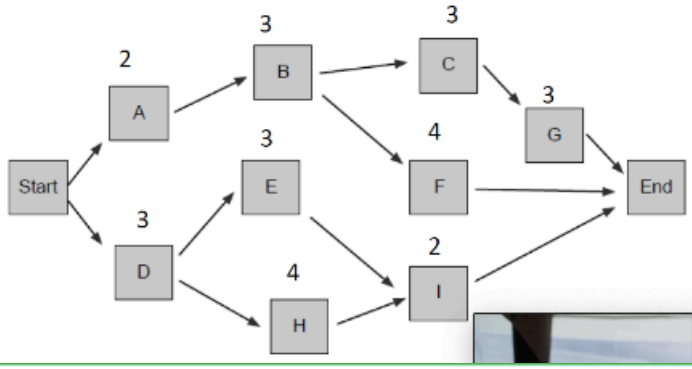
✔ is a technique used for constructing a schedule model in which activities are represented by nodes and are graphically linked by one or more logical relationships to show the sequence in which the activities are to be



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

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

Putting these values in the formula, we get
$E\_PERT=(45+225+4\times90)/6 = 105$ minutes

PERT with Standard Deviation

The Standard Deviation for PERT can be calculated by using the following formula:
$\sigma = (cP - cO)/6 \quad \sigma = (225 - 45)/6 \quad \sigma = 30$ minutes

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

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, high grade

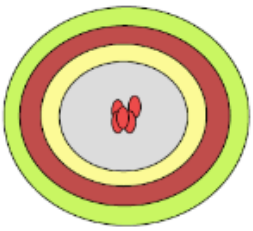
good ingredients (high grade). However, the burger arrives burnt and inedible! Although the grade is high, the quality is low.

Low quality, low grade

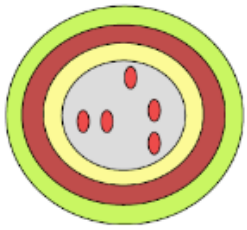
burger arrives burnt and inedible (low quality) with low-grade meat or have unhealthy ingredients that make it less desirable (low grade).

PLAN QUALITY

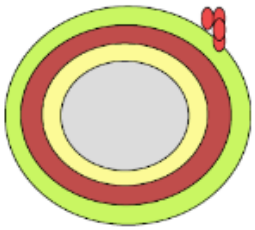
Precision vs. accuracy



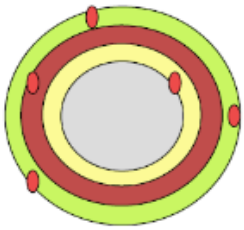
Accurate & Precise



Accurate, but not Precise



Precise, but not Accurate

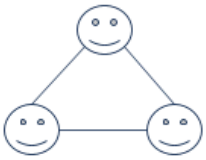


Not Accurate, not Precise

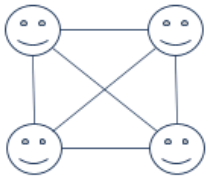
Tools & Techniques: Communication requirement analysis

- ✔ 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.

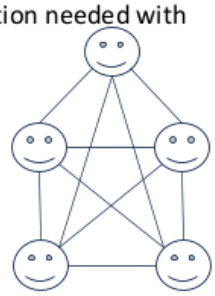
Two People
One Channel



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