

Management Tools

BPF2123 – Quality Management System



Chapter Outline

- Why-Why Diagram
- Forced Field Analysis
- Nominal Group Technique
- Affinity Diagram
- Interrelationship Diagram
- Tree Diagram
- Matrix Diagram
- Prioritization Matrices
- Process Decision Program Chart
- Activity Network Diagram

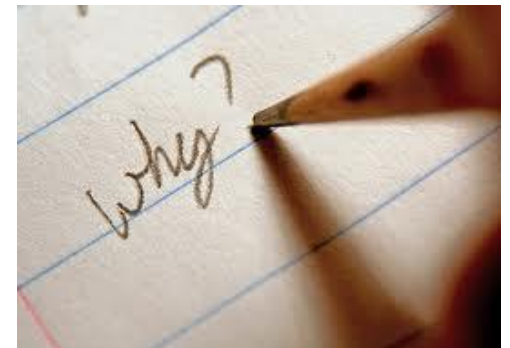
Lesson Outcomes

- Identify application of tools that been used in process improvement, cost reduction, policy deployment and new-product development
- Learn how to construct quality tools that don't use hard data but rely on subjective information



Why-Why

- A key to finding the root cause of a problem by focusing on the process rather than on people
- The procedure is to describe the problem in specific terms and then ask why
- Have to ask why three or more times to obtain the root cause
- The tool is very beneficial in developing critical thinking – quick method of solving a problem



Why-Why

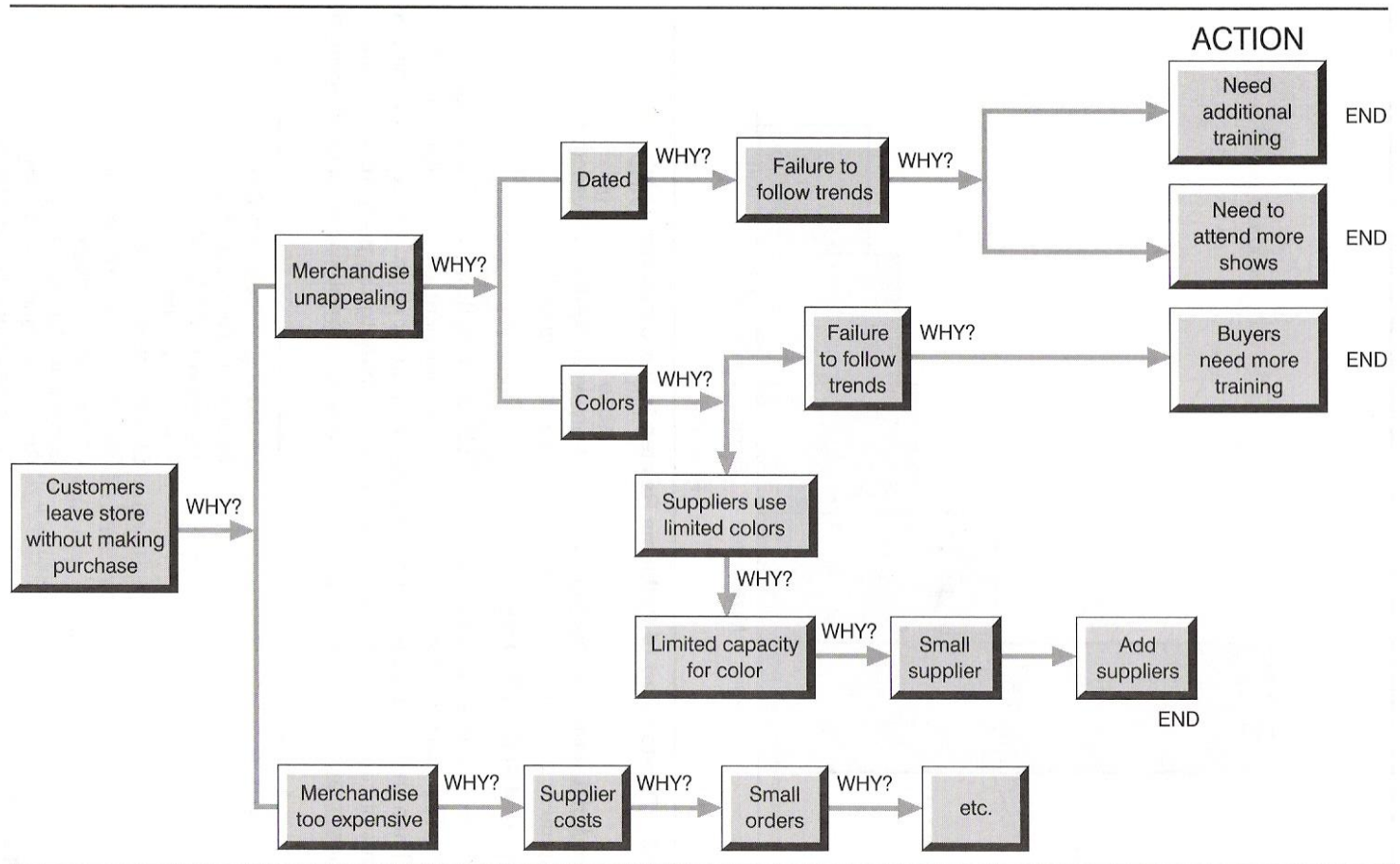
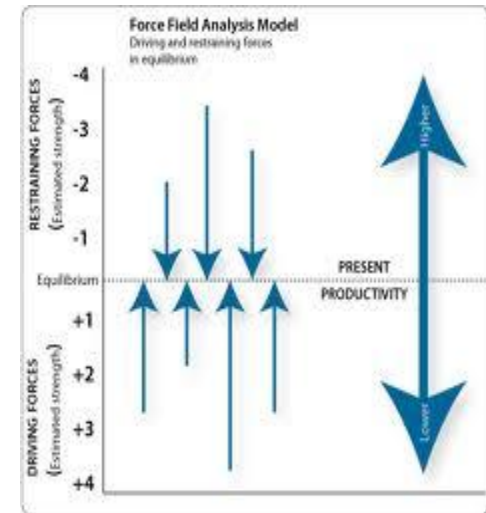
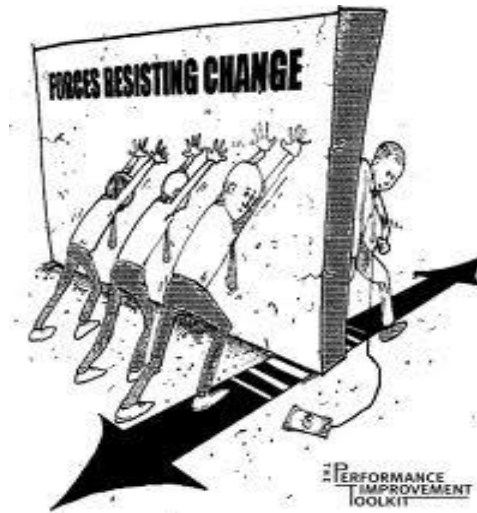
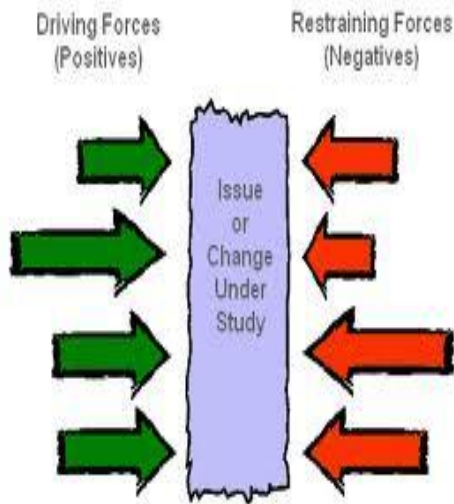


Figure 3.10 A WHY-WHY Diagram

Forced Field Analysis

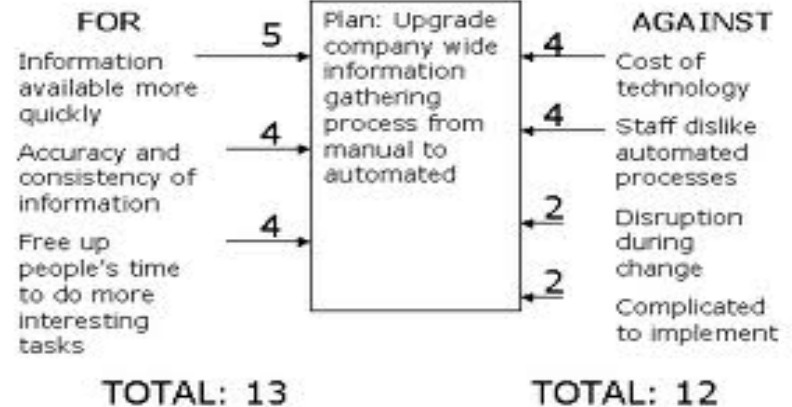
- Analysis is used to identify the forces and factors that may influence the problem or goal
- It helps an organization to better understand promoting or driving and restraining or inhibiting forces
- The positives can be reinforced and the negatives reduced or eliminated
- The procedure is to define the objective, determine criteria for evaluating the effectiveness of the improvement action, brainstorm the forces that promote and inhibit achieving the goal, prioritize the forces from greatest to least and take action.

Forced Field Analysis



Objective: Stop Smoking

Promoting Forces	Inhibiting Forces
Poor Health	Habit
Smelly Clothing	Addiction
Poor Example	Taste
Cost	Stress
Impact on Others	Advertisement



Nominal Group Technique

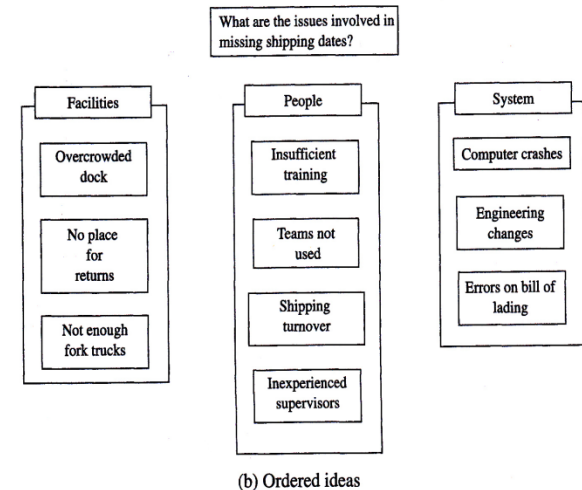
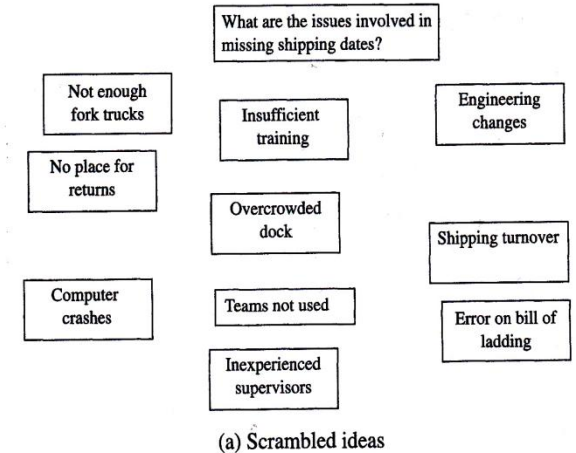
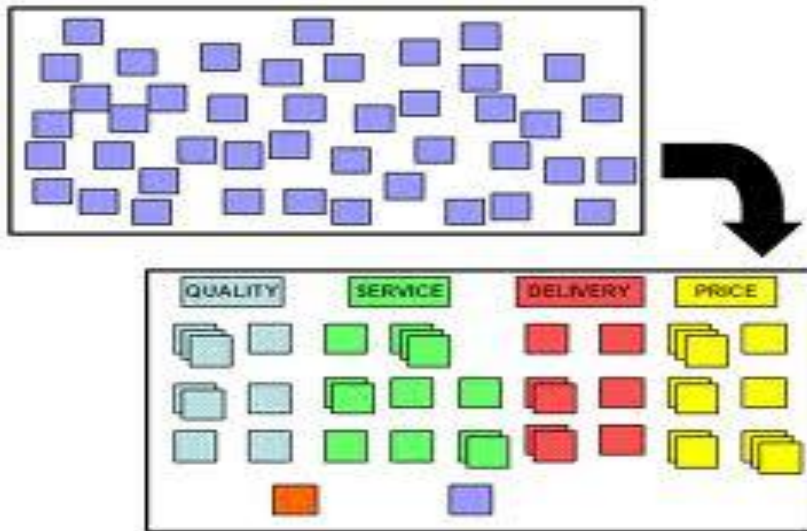
- Technique provides for issue / idea input from everyone on the team and for effective decisions
- Each team members writes on a piece of paper the problem they think is most important – papers are collected and all problems are listed
- Use another piece of paper to rank the problems from least to most important – the ranking are given a numerical value
- Points for each problem are totaled, and the item with the highest points is considered to be the most important



Affinity Diagram

- Diagram allows the team to creatively generate a large number of issues / ideas and then logically group them for problem understanding and possible breakthrough solution
- The procedure is to state the issue in a full sentence, brainstorm using short sentences, post them for the team to see, sort ideas into logical groups and create concise descriptive headings for each group.
- Diagrams encourage team creativity, break down barriers, facilitate breakthroughs and stimulate ownership of the process

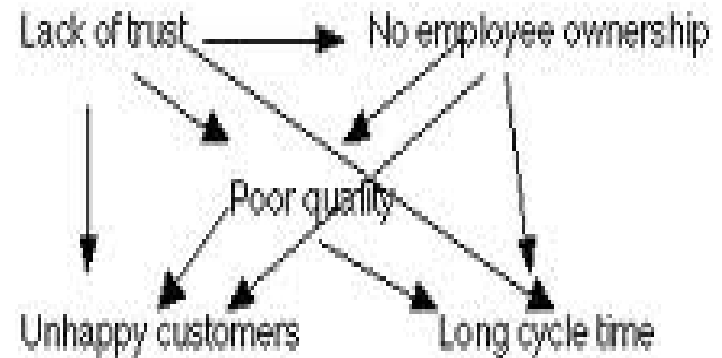
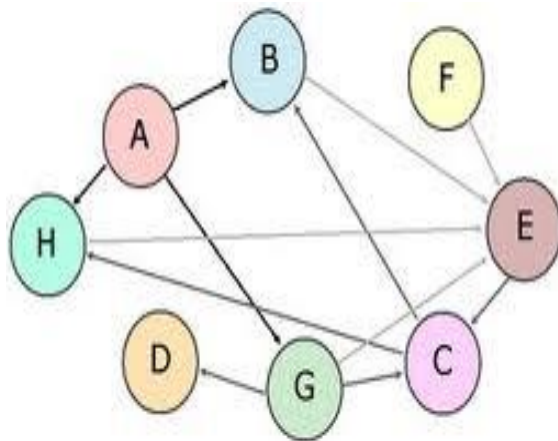
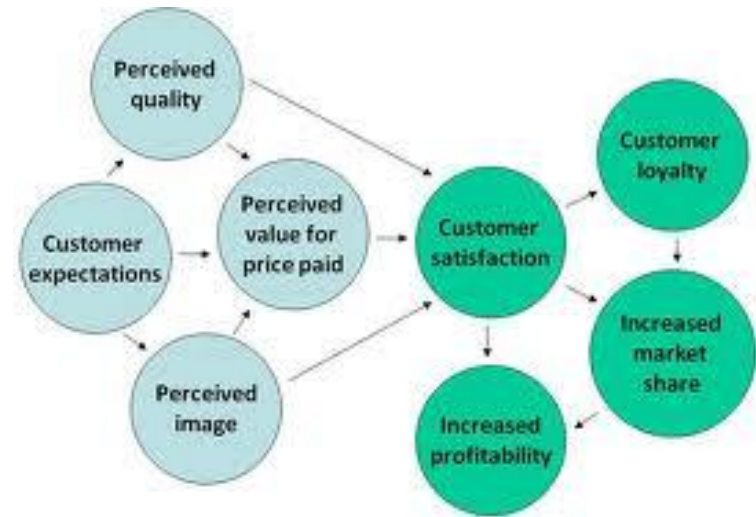
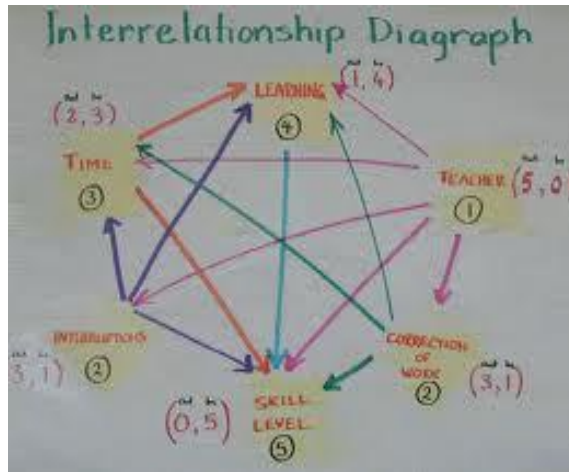
Affinity Diagram



Interrelationship Digraph

- ID clarifies the interrelationship of many factors of a complex situation
- It allows the team to classify the cause-and-effect relationships among all the factors so that the key drivers and outcomes can be used to solve the problem
- The procedure is start with the first issue and evaluate the cause-and-effect relationship for each issues in the circle; arrow is drawn from stronger issue to weaker issue
- The diagram is completed by tallying the incoming and outgoing arrows – usually highest outgoing arrows (driver) is the root cause

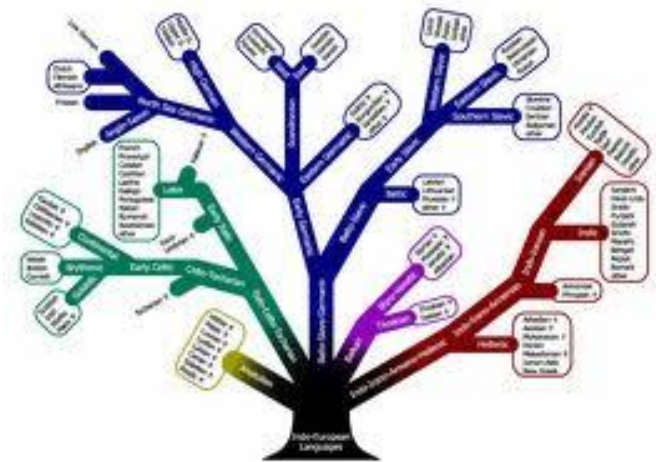
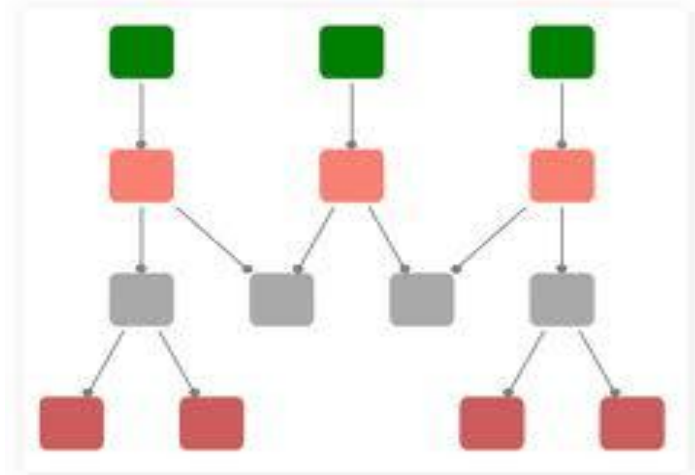
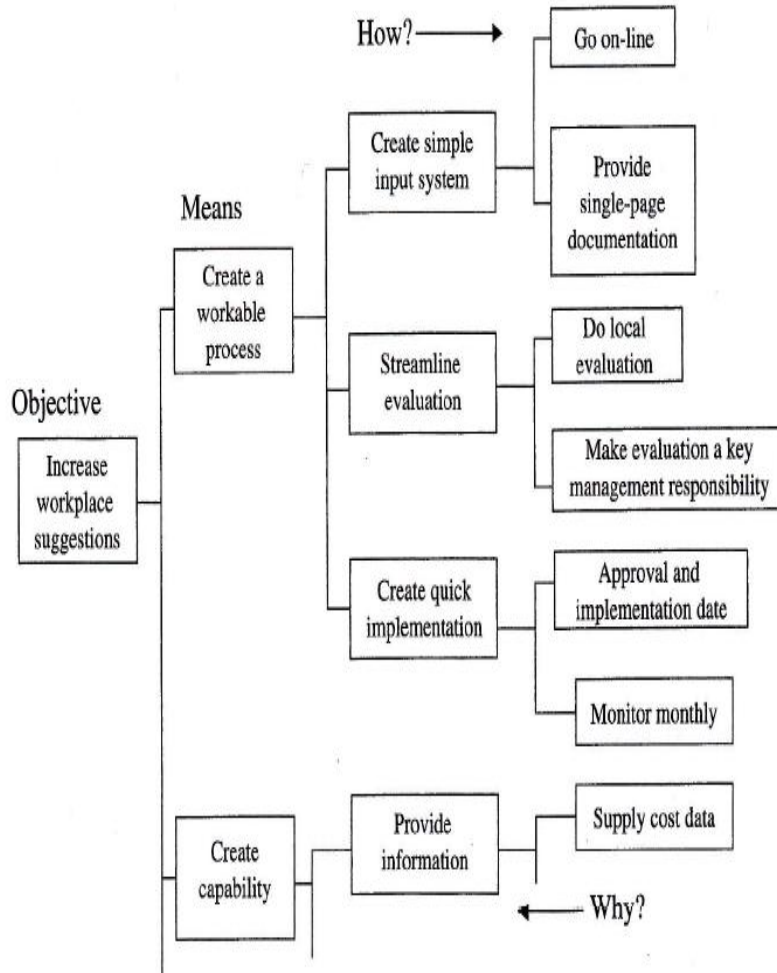
Interrelationship Digraph



Tree Diagram

- This tool is used to reduce any broad objective into increasing levels of detail in order to achieve the objective
- The procedure is choose an action-oriented objective statement, using brainstorming to choose the major headings and then generate the next level by analyzing the major headings
- The diagram should be reviewed to determine if these actions will give the results anticipated or if something has been missed
- Diagram encourages team members to think creatively and makes large projects manageable

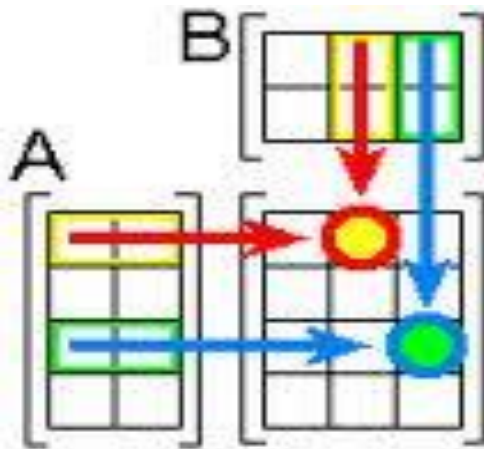
Tree Diagram



Matrix Diagram

- The matrix diagram allows individuals or teams to identify, analyze and rate the relationship among two or more variables
- Data are presented in table form and can be objective or subjective which can be given symbols with or without numerical values
- The procedure is the team to select the factors affecting a successful plan and followed by determining the relationship symbols
- Any symbols can be adopted, provided the diagram contains a legend
- Diagram clearly shows the relationship of the two variables

Matrix Diagram



	1a	1b	1c	1d	← Variable 1
2a		⊙	⊙	△	<p>Typical legend ratings</p> <p>⊙ Primary responsibility ⊙ 9</p> <p>○ Secondary responsibility ○ 3</p> <p>△ Should be kept informed △ 1</p>
2b	△				
2c		⊙	○		
2d	○				
					↑ Variable 2

The Business Growth Matrix



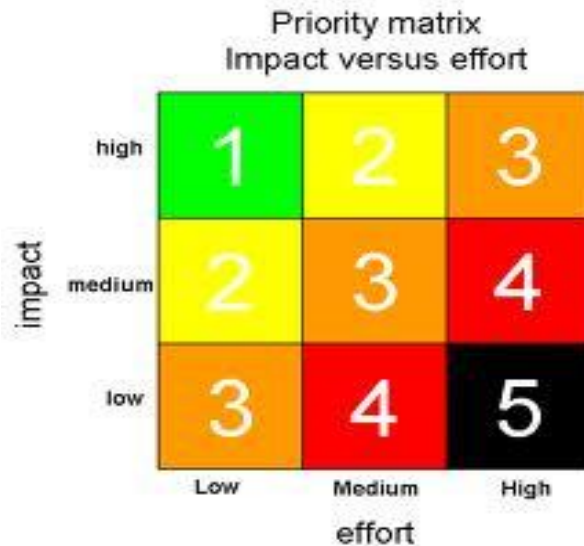
Task Description

Identify missing or incomplete policies
 Establish Policies as necessary and ensure adoption globally
 Completion of necessary Policies
 Document Policies as appropriate
 Approve Policies
 Communicate Policies as required
 Ensure Policies are compatible with standards and best practice
 Escalate non standard or missing policies
 BP Sponsor with agreement from BPB colleagues decides on exception or not

	Sponsor	Business Owner	Business Program Mgr	Process Manager
		R	A	R
		A	R	R
		R	A	R
		R	R	A
	A	C	I	I
		A	I	I
		R	R	A
	R	R	R	A
	A	I	I	I

Prioritization Matrices

- Tools prioritize issues, tasks, characteristics and so forth, based on weighted criteria using a combination of tree and matrix diagram techniques
- PM are designed to reduce the team's options rationally before detailed implementation occurs



Prioritization Matrices

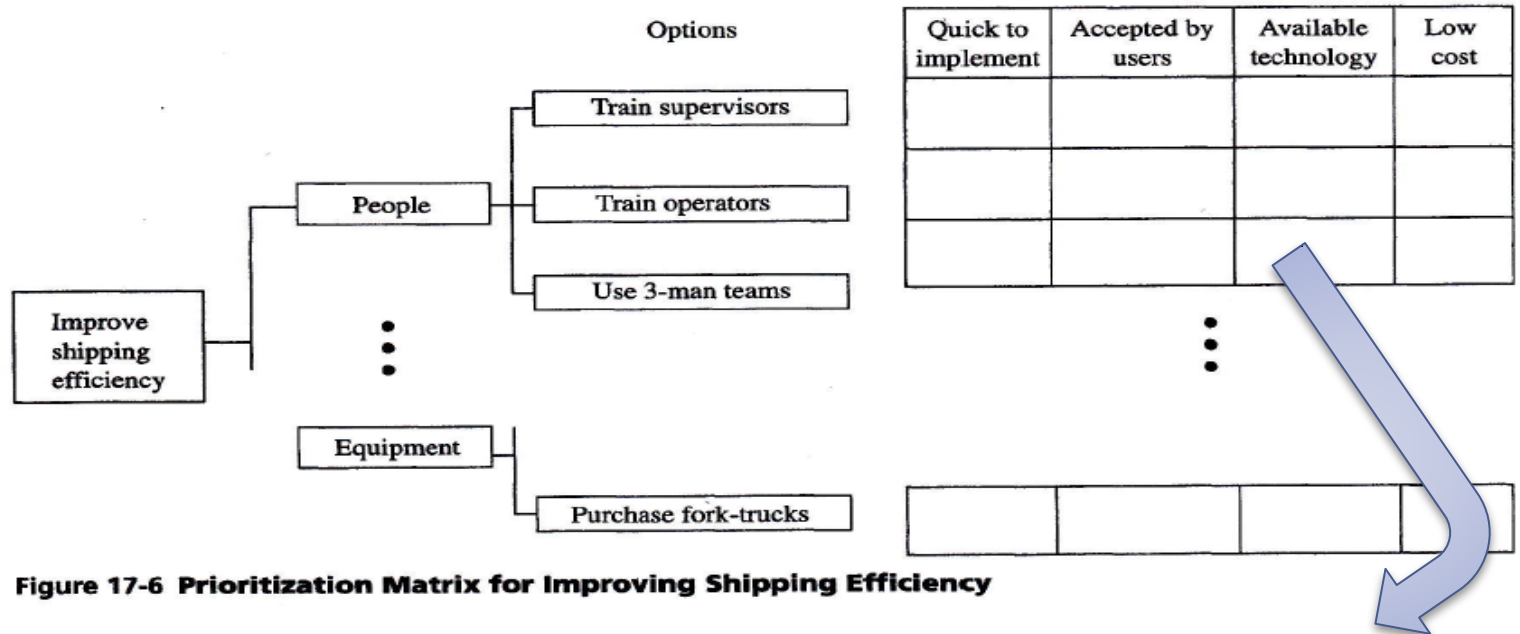


Figure 17-6 Prioritization Matrix for Improving Shipping Efficiency

Prioritize the criteria using the nominal group technique (NGT)

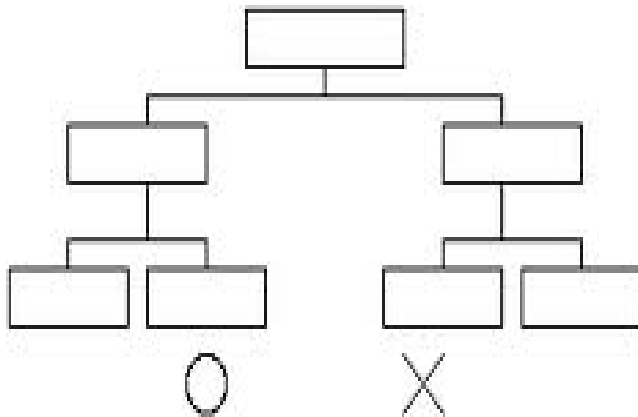
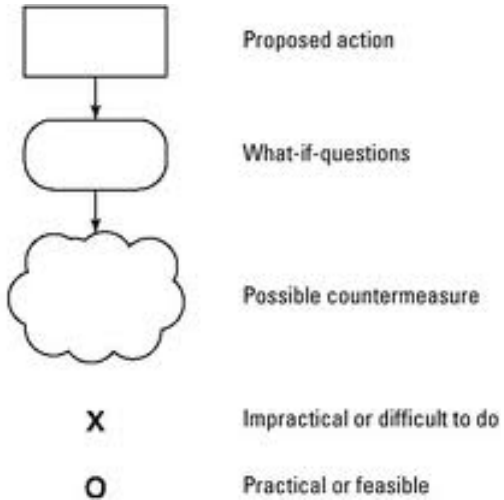
Criteria	Member #1	Member #2	...	Total
Accepted by users	.30	.25		1.50
Low cost	.15	.20	...	0.35
Quick to implement	.40	.30		2.10
Available technology	.15	.25		0.45
	1.00	1.00		

PDPC

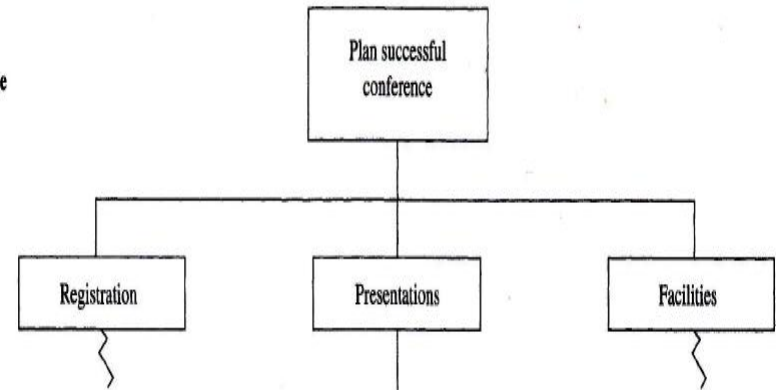
- Process Decision Program Chart use to avoid surprises and identifies possible countermeasures
- Procedure starts with the team stating the objective and followed by the activity (level)
- Countermeasures are brainstormed and placed in the last level – evaluate the countermeasures and select the optimal ones by placing an “O” underneath and place an “X” under those that are rejected
- Used when the task is new or unique, complex or potential failure has great risks – mechanism to minimize uncertainty in an implementation plan

PDPC

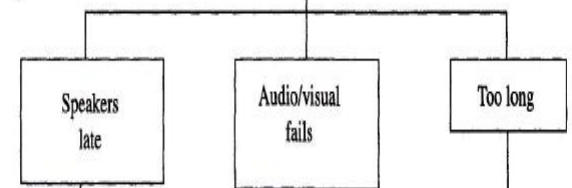
Legend:



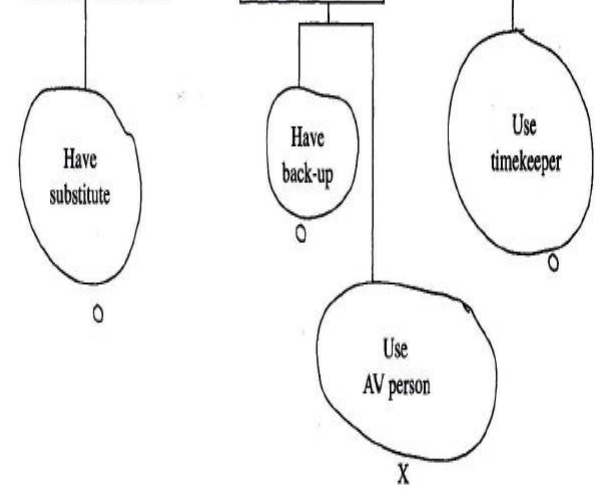
Objective



What If



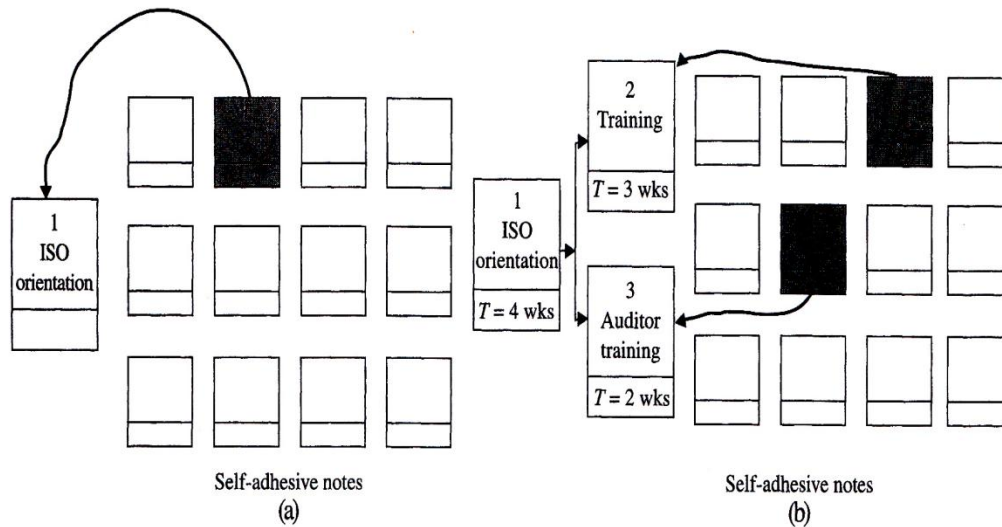
Counter-measures



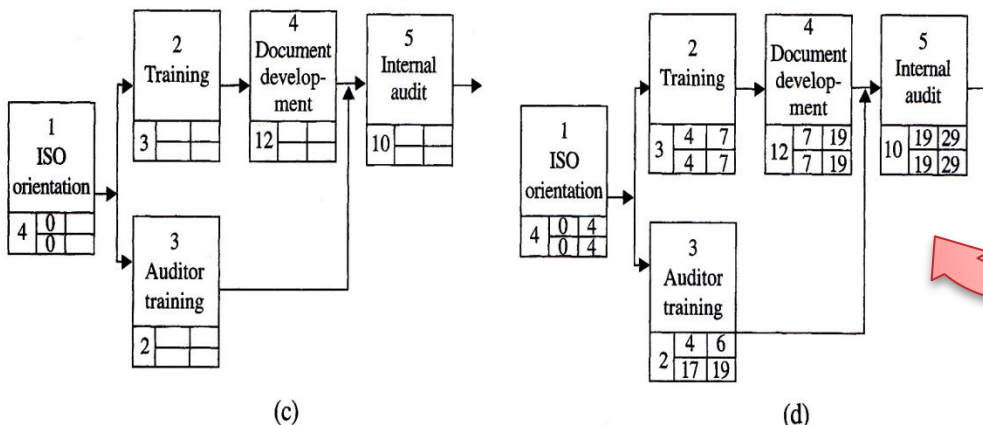
Activity Network Diagram

- It allows the team to schedule a project efficiently
- The diagram shows completion times, simultaneous tasks and critical activity path
- Also known as program evaluation and review technique (PERT), critical path method (CPM), arrow diagram and activity on node (AON)
- Benefits are:
 - A realistic timetable determined by the users
 - Team members understand their role in the overall plan
 - Bottlenecks can be discovered & corrective action taken
 - Members focus on the critical tasks

Activity Network Diagram



Determine the critical path



Activity time [T]	Earliest Start [ES]	Earliest Finish [EF]
	Latest Start [LS]	Latest Finish [LF]

Figure 17-8 Activity Network Diagram