Management Tools
Chapter 17

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Management & Planning Tools

- Why Why??

- Forced Field Analysis

- Nominal Group Technique

Why Why Tool

- Very simple and effective tool.

- Focuses on the process rather than on people.

- Quick method to solve problems.

Example

- Why did we miss the deadline ?

- The machine broke.

- Why did the machine broke?

- The machine never had maintenance.

- Why?

- The maintenance record is missing

Forced Field Analysis

- What it does?

- How to use it:

    - Define the objective
    - Determine criteria/problem
    - Brainstorm forces
    - Prioritize forces
    - Take action

Forced Field Analysis

Objective: Stop Smoking

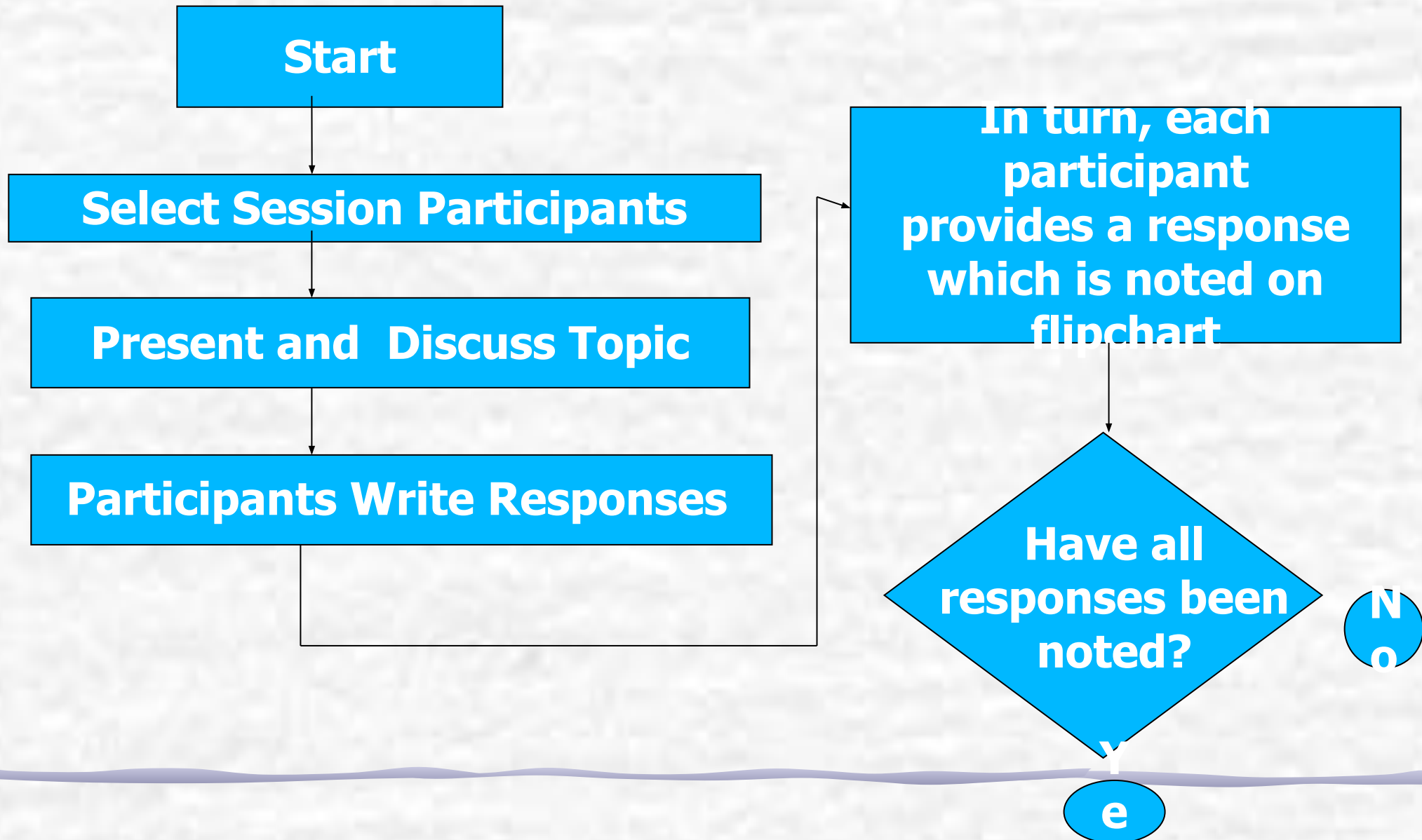| Promoting forces			Inhibiting Forces
Poor Health	→	←	Habit
Smelly Clothing	→	←	Addiction
Poor Example	→	←	Taste
Cost	→	←	Stress
Impact on Others	→	←	Advertisement

−   +

Nominal Group Technique

- Developed in 1971

- Consensus planning tool

- Used for:

    - Identifying major strengths
    - Equal opportunity/voice
    - Increase participation
    - Reduce errors

- Simple Process:
    - Generate written ideas "individually".
    - List ideas on chart.
    - Rank all the ideas on paper "individually".
    - Rank
    - Most important

Nominal Group Technique Diagram

Start

Select Session Participants

Present and Discuss Topic

Participants Write Responses

In turn, each participant provides a response which is noted on flipchart

Have all responses been noted?

No

Yes

Management & Planning Tools

Affinity Diagram

Interrelationship Digraph

Tree Diagram

Matrix Diagram

Prioritization Matrices

Process Decision Program Chart

Activity Network Diagram

Affinity Diagram

- What it does?

- When to use?

- Benefits of using

- The Process
  - State the issue
  - Brainstorm and post
  - Sort ideas
  - Create headings

Affinity Diagram

What are the issues involved in missing shipping dates

Not enough fork trucks

Insufficient training

Engineering changes

No place for returns

Overcrowded dock

Shipping turnover

Teams not used

Computer crashes

Inexperienced supervisors

Error on bill of lading

Affinity Diagram

What are the issues involved in missing shipping dates

Facilities

- Overcrowded dock
- No place for returns
- Not enough fork trucks

People

- Insufficient training
- Teams not used
- Shipping turnover
- Inexperienced supervisors

System

- Computer crashes
- Engineering changes
- Errors on bill of lading

Affinity Diagram

Example

Interrelationship Digraph

- Clarifies interrelationship of many factors

- Classifies cause-and-effect relationships

The Process:

1) Agree on the issue or question
2) Add a symbol to the diagram
3) Put ideas in a circle
4) Compare elements to others
5) Use arrows
6) Draw arrows from element of influence
7) Review and revise
8) Determine root causes or drivers

Interrelationship Diagram

Lack of respect for others

Unnecessary packaging

Lack of awareness of impact

Lack of parental examples

Outcome

Inadequate penalties

Not enough receptacles
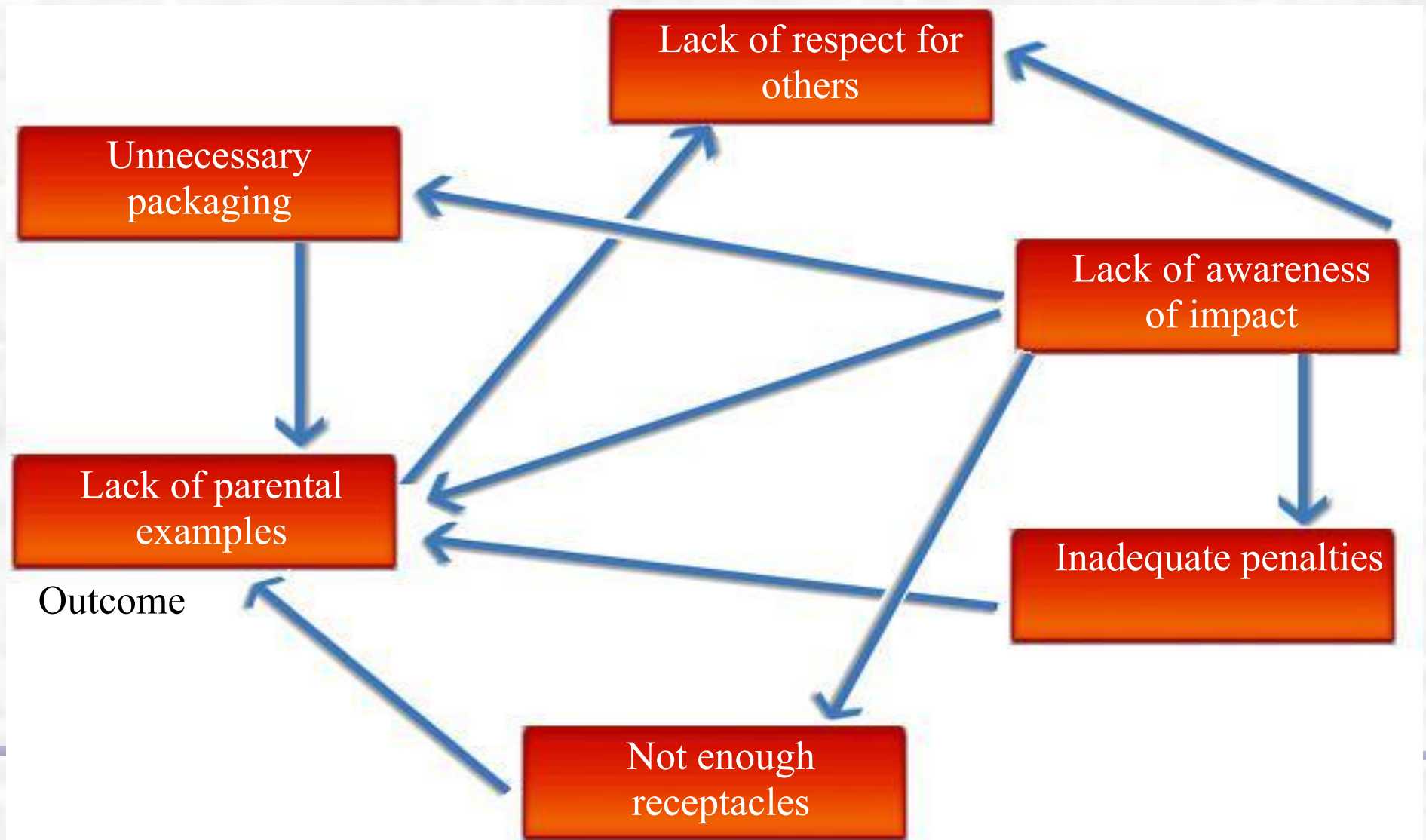
Questions
Comments

Tree Diagram

- Used to reduce encourage team members to think creatively, make large projects manageable and generates a problem-solving atmosphere.

- The Process:

  - Choose action-oriented objective statement from " interrelationship diagram, brainstorming or team mission statement".

  - Choose the major headings.

  - Analyze the major headings.

  - For each task node, think of the sub-tasks that will be required, and add them to the tree.

Tree Diagram
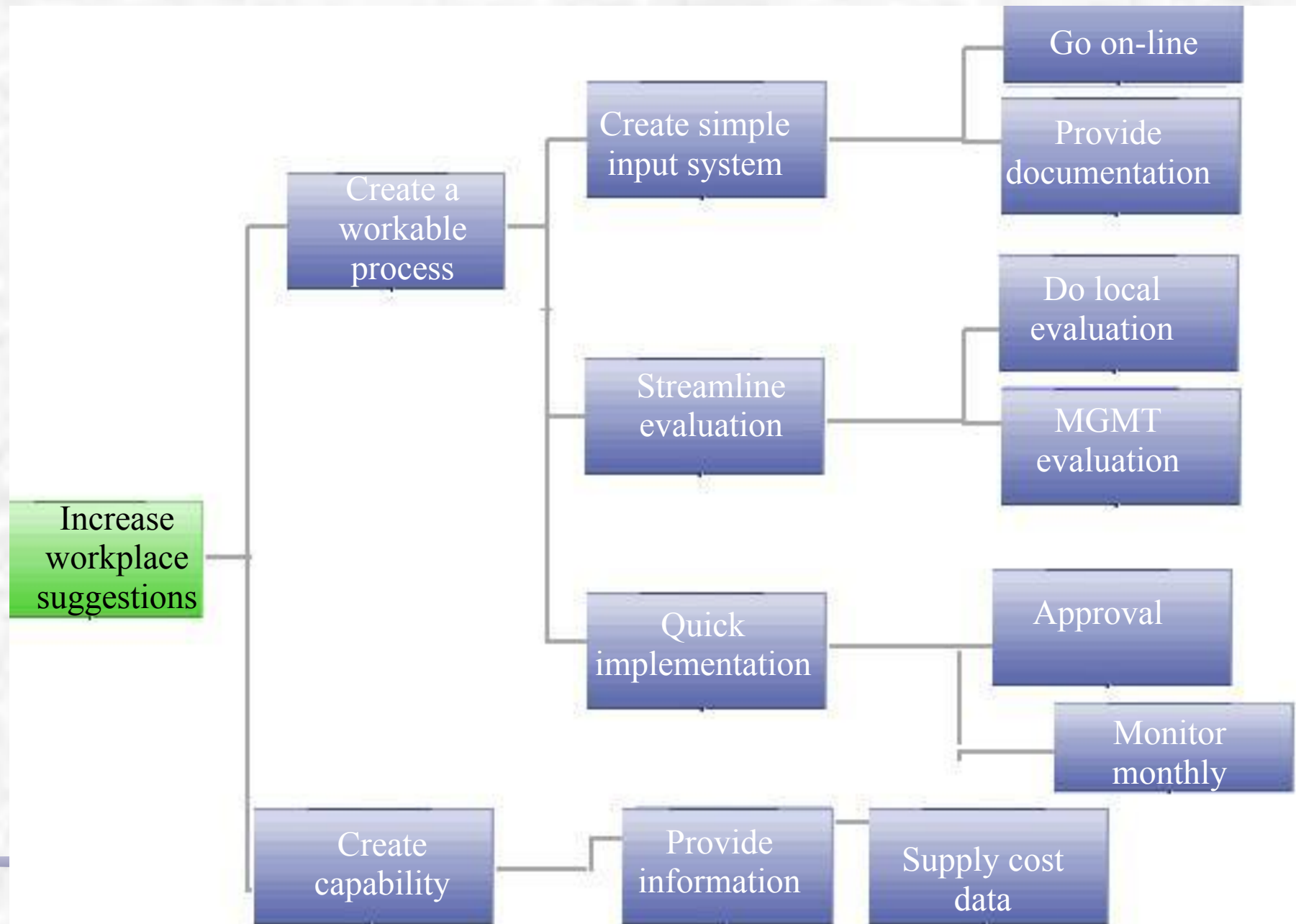
Matrix Diagram

- Used to identify, analyze and rate the relationship among two or more variables.
  - Select factors.
  - Select appropriate format.
  - Define symbols.
  - Analyze each cell by inserting the appropriate symbol.

Matrix Diagram

Tool \ Use	Creativity	Analysis	Consensus	Action
Affinity Diagram	○ Always		○ Always	△ Occasionally
Interrelationship		○ Always	◉ Frequently	
Tree Diagram		◉ Frequently		◉ Frequently
Prioritisation			○ Always	
Matrix Diagram		○ Always	◉ Frequently	○ Always
PDPC	◉ Frequently	◉ Frequently	◉ Frequently	○ Always
Activity network			◉ Frequently	○ Always

Always ○   Frequently ◉   Occasionally △

Prioritization Matrix

- What it does?
- When to use it:

  - Broad objectives must be broken down
  - All of the implementation options must be explored
  - Assignable tasks must be created

Prioritization Matrix

MEDICAL LAB :: QUALITY IMPROVEMENT PROJECTS :: DECISION MATRIX

POTENTIAL PROJECTS	CRITERIA						SUMMARY
	Ease of implementation 4	Potential Impact 3	Cost 3	Urgency 5	Most Requested by Customers 1	Obstacles 3	
Improve tracking of blood samples	5 x 4 = 20	3 x 3 = 9	5 x 3 = 15	3 x 5 = 15	2 x 1 =2	5 x 3 = 15	76
Improve consistency of blood work analysis	2 x 4 = 4	5 x 3 = 15	2 x 3 = 6	5 x 5 = 25	5 x 1 = 5	1 x 3 = 3	58
Improve documentation for criminal cases	4 x 4 = 16	4 x 3 = 12	3 x 3 = 9	4 x 5 = 20	4 x 1 = 4	3 x 3 = 9	70
Improve communication with hospital	3 x 4 = 12	3 x 3 = 9	3 x 3 = 9	2 x 5 = 10	3 x 1 = 3	2 x 3 = 6	49
Speed up blood work analysis	3 x 4 = 12	3 x 3 = 9	4 x 3 = 12	3 x 5 = 15	4 x 1 = 4	3 x 3 = 9	61

Process Decision Program Chart (PDPC)

- What it does?

- When to use it:

  - The task is new, unique

  - The task is complex

  - The implementation must keep to a tight schedule

  - There are problems with a reasonable chance of happening

PDPC

- The process decision program chart is a tool for contingency planning.
- Helps the user to select the best processes to be used to accomplish a desired task
- Assists in visualizing the alternatives
  - Forward planning
  - Backward planning

Process Decision Program Chart

```
                        ┌──────────────────┐
                        │ Plan successful  │
                        │   conference     │
                        └──────────────────┘
                                 │
        ┌────────────────────────┼────────────────────────┐
        ▼                        ▼                         ▼
┌──────────────┐        ┌──────────────┐          ┌──────────────┐
│ Registration │        │ Presentation │          │  Facilities  │
└──────────────┘        └──────────────┘          └──────────────┘
                                 │
        ┌────────────────────────┼────────────────────────┐
        ▼                        ▼                         ▼
  ┌──────────┐            ┌──────────┐              ┌──────────┐
  │ Speakers │            │  Audio   │              │   Too    │
  │   late   │            │  fails   │              │   long   │
  └──────────┘            └──────────┘              └──────────┘
        │                  ┌───────┐                     │
        │             Have │       │                     │
        ▼             backup│      ▼                     ▼
    ( have       )          │  ( Use AV  )         ( Use       )
    ( substitute )          │  ( person  )         ( timekeeper )
                       (Have backup)
```
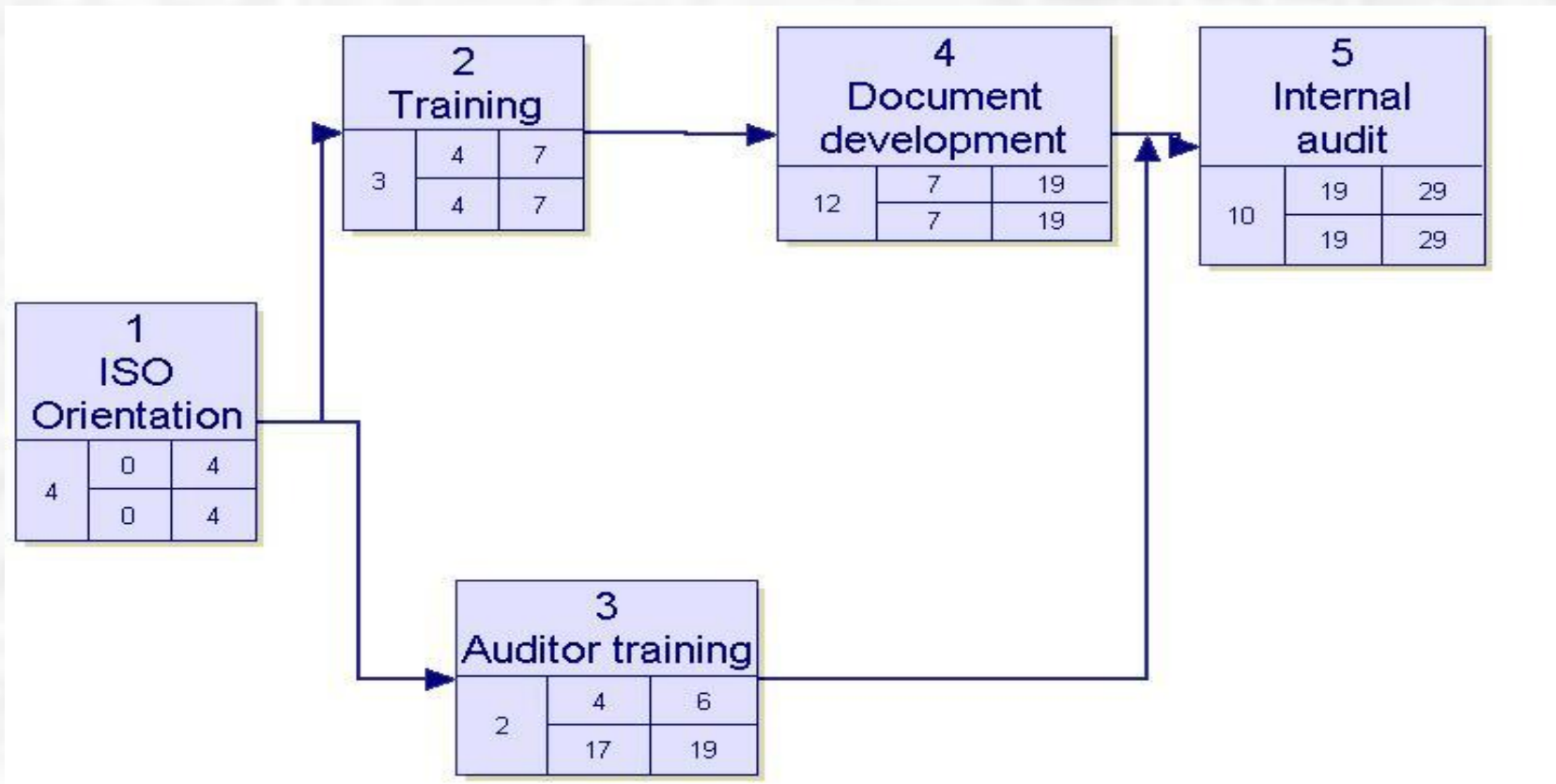
Plan successful conference

- Registration
- Presentation
  - Speakers late → have substitute
  - Audio fails → Have backup / Use AV person
  - Too long → Use timekeeper
- Facilities
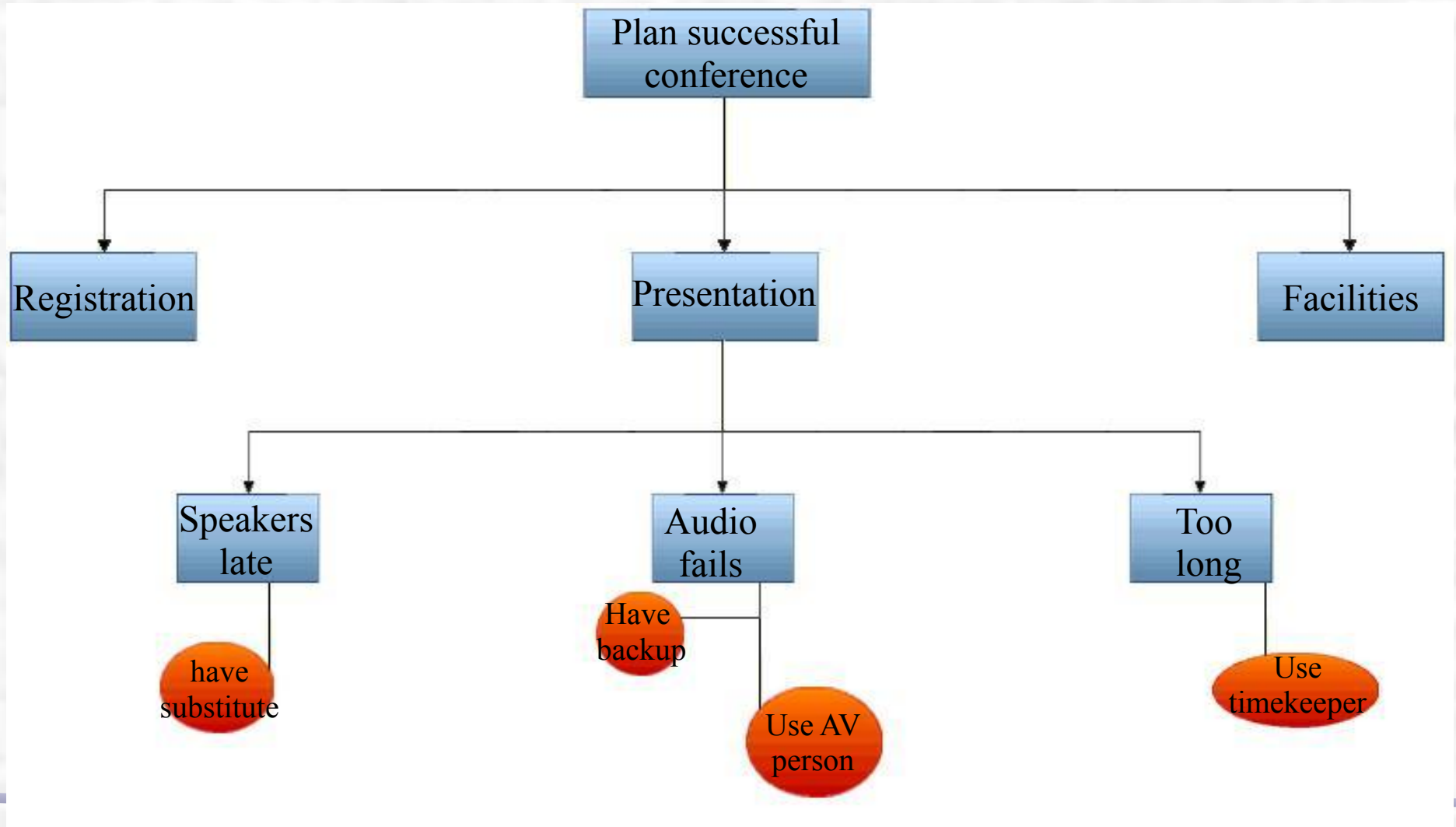
Activity Network Diagram

Activity Network Diagram

- What it does?
- When to use it:
  - The task is a complex one
  - The sub tasks are familiar with know duration
  - The projects is a critical org. target
  - Simultaneous implementation paths must be coordinated
  - There is little margin for error in the actual vs. the estimated time of completion

Activity Network Design

- Some other versions of this method
  - PERT chart
    - Programme evaluation review technique
  - Arrow Diagram
  - CPM Chart
    - Critical Path Method

Quality Control Tools

Cause & Effect (Fish bone)

Flow Chart

Run Chart

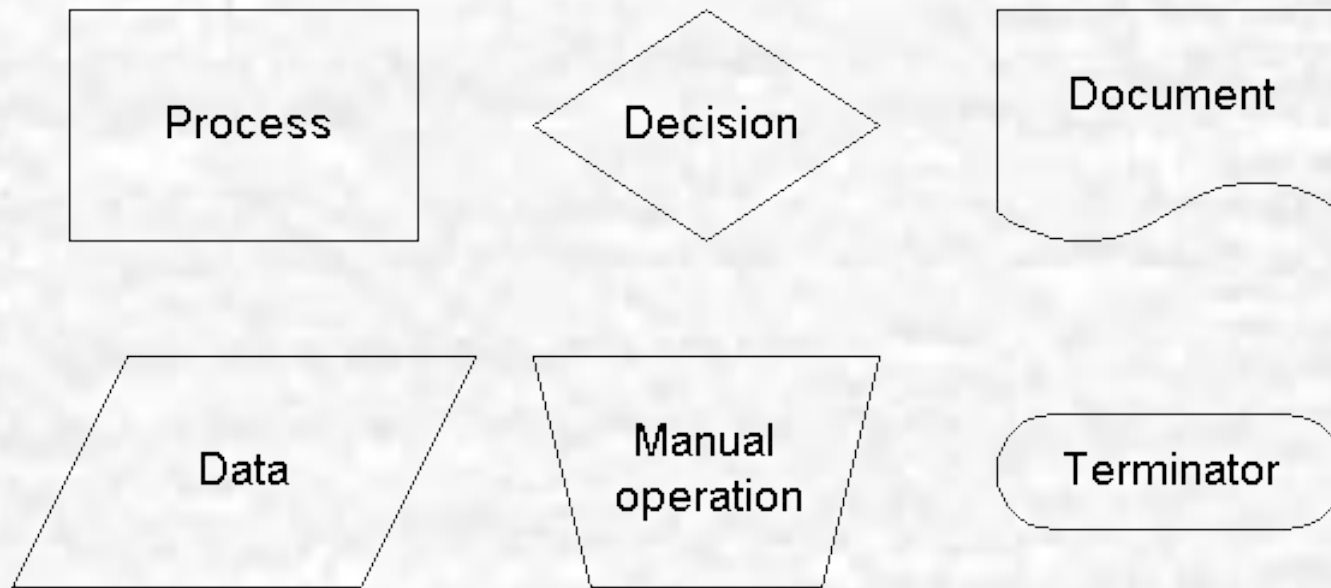Control Chart

Histogram

Pareto Chart

Cause & Effect Diagram

- A diagram composed of lines and symbols designed to represent a meaningful relationship between an effect and its causes

- Developed by Dr. Kaoruno Ishikawa and adapted to improving quality by Dr. W. Edwards

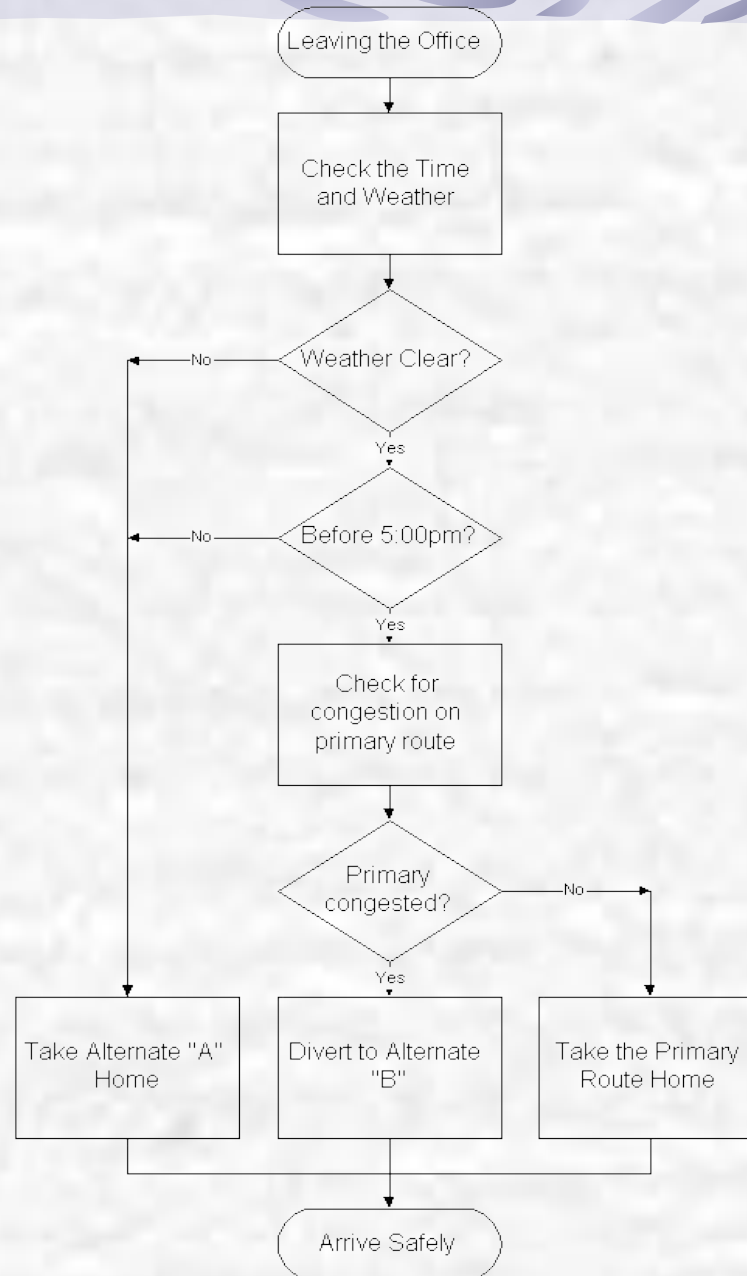- Often referred to as an Ishikawa diagram or fishbone diagram

Flow Charts

- A flow chart is a pictorial representation showing all of the steps of a process.

- **A Flowchart is used for:**

1. Defining and analyzing processes
2. Building a step-by-step picture of the process for analysis, discussion, or communication purposes
3. Defining, standardizing, or finding areas for improvement in a process

Symbols Used

Process

Decision

Document

Data

Manual operation

Terminator

The Best Way Home

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                    ┌─────────────────┐
                    │ Leaving the Office │
                    └────────┬────────┘
                             │
                             ▼
                    ┌─────────────────┐
                    │  Check the Time  │
                    │   and Weather    │
                    └────────┬────────┘
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   No ◄─────────────── ◇ Weather Clear? ◇
   │                             │
   │                            Yes
   │                             ▼
   No ◄─────────────── ◇ Before 5:00pm? ◇
   │                             │
   │                            Yes
   │                             ▼
   │                    ┌─────────────────┐
   │                    │   Check for     │
   │                    │  congestion on  │
   │                    │  primary route  │
   │                    └────────┬────────┘
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   │                    ◇ Primary congested? ◇ ──No──►
   │                             │                   │
   │                            Yes                  │
   ▼                             ▼                   ▼
┌──────────────┐   ┌──────────────┐   ┌──────────────┐
│Take Alternate│   │  Divert to   │   │ Take the     │
│  "A" Home    │   │ Alternate "B"│   │ Primary      │
│              │   │              │   │ Route Home   │
└──────┬───────┘   └──────┬───────┘   └──────┬───────┘
       │                  │                  │
       └──────────────────┼──────────────────┘
                          ▼
                 ╭─────────────────╮
                 │  Arrive Safely  │
                 ╰─────────────────╯
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Run Chart

- Run chart allows teams to study observed data for trends or patterns over a specified period of time.
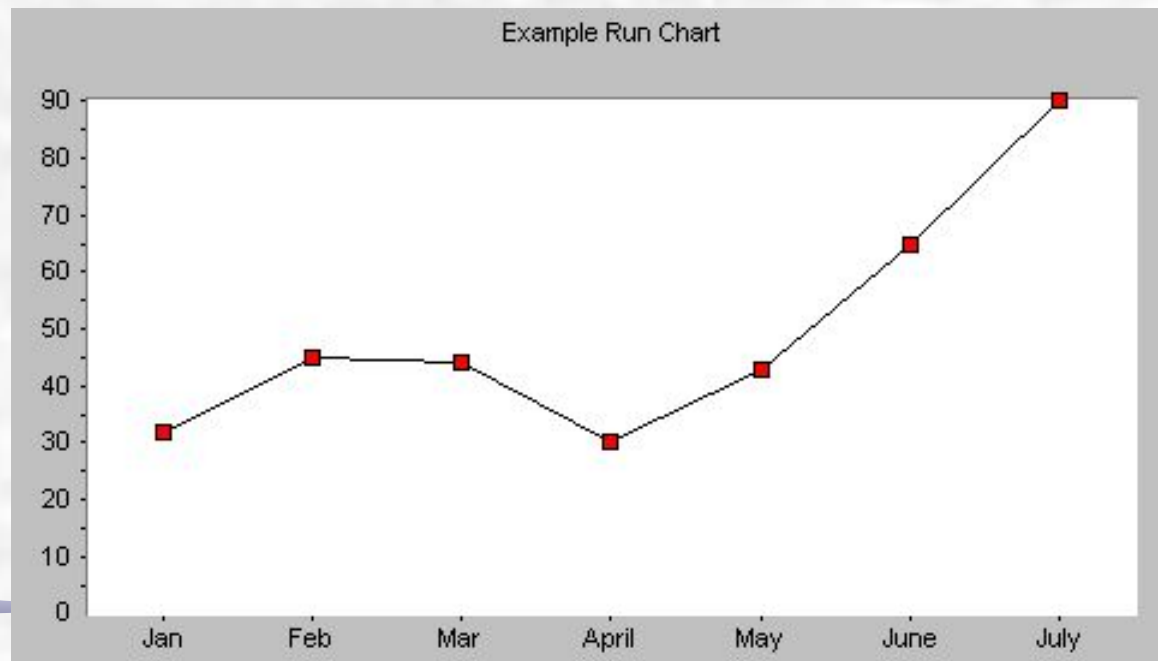
Control Chart

- A statistical control chart is a graphic comparison of process performance data to computed "statistical control limits," drawn as limit lines on the chart.

- A statistical tool used to distinguish between process variation resulting from common causes and variation resulting from special causes.

Control Chart

- Benefits
  - Monitor process variation over time
  - Differentiate between special cause and common cause variation
  - Assess the effectiveness of changes to improve a process
  - Communicate how a process performed during a specific period

Control Chart

- Types of Control charts
  - Attribute Data
    - Data that results from counting the number of occurrences
  - Variables Data
    - Displays values resulting from the measurement of a continuance variable

Control Chart

- Three types of of charts:

  - X-Bar and R Chart
  - Individual X and Moving Range Chart for variables Data
 - Individual X and Moving Range Chart for Attribute Data

Histogram

- A histogram is a graphic summary of variation in a set of data

- Basic data analysis tool for analyzing frequency of occurrence of items

- provides an easy-to-read picture of the location and variation in a data set.

Pareto Chart

- Pareto analysis is a ranked comparison of factors related to a quality problem

- Prioritized bar chart for determining which problem to work on first.

- Arranging data so that the few vital factors that are causing most of the problems reveal themselves.

Pareto Chart
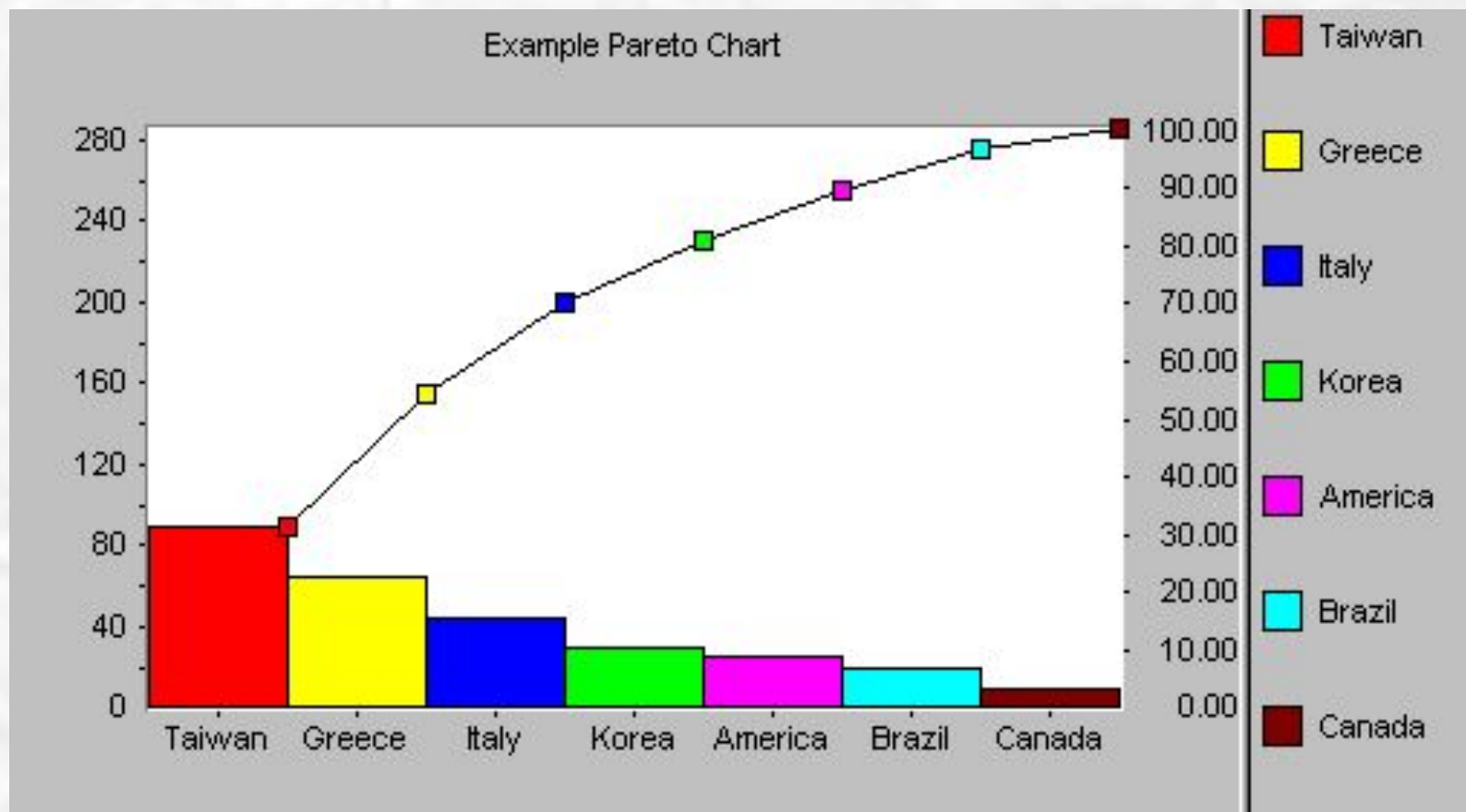
Creativity Tools

- Brainwriting 6-3-5
- Classic Brainstorming
- Imaginary Brainstorming
- Knowledge mapping
- Morphological Box
- Picture Associations and Biotechniques

- Problem Reformulation
- Purpose Hierarchy
- TILMAG
- Word Association and Analogies

QUESTIONS
COMMENTS