



Param Pujya Dr. Babasaheb Ambedkar Smarak Samiti's

**Dr. Ambedkar Institute of Management Studies & Research**

Deeksha Bhoomi, Nagpur - 440010 (Maharashtra State) INDIA

NAAC Accredited with 'A' Grade

Tel: +91 712 6521204, 6521203, 6501379

Email: info@daimsr.in

# **Total Quality Management**

## **Sub Code- MBEIV - 13**

**Unit – II**

**Prepared by- Dr. Pallawi Sangode**

# Program Objectives

- PO1:** Apply knowledge of management theories and practices to solve business problems.
- PO2:** Foster Analytical and critical thinking abilities for data-based decision making.
- PO3:** Ability to develop value based leadership ability.
- PO4:** Ability to understand, analyze and communicate global, economic, legal, and ethical aspects of business.
- PO5:** Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to team environment.

# Program Objectives

- PO6:** Ability to evaluate a business idea and formulate a feasible business plan.
- PO7:** Recognize the need for and have the orientation and ability to engage in an independent & lifelong learning in a dynamic business environment.
- PO8:** Ability to appraise and explain societal and environmental aspects of business.

# Course Objectives- TQM

- CO1: Utilize/ design** the basic tools of quality for quality related issues in the organization/ workplace.
- CO2: Select** appropriate TQM tool for troubleshooting issues related to quality in organization.
- CO3: Implement** Six Sigma for process improvement at workplace.
- CO4: Identify** the causes of variation in a manufacturing set up and implement Statistical Process Control to support data based problem solving.
- CO5: Identify** benchmark for himself/ herself and/ or organization
- CO6: Implement** KAIZEN at workplace for identifying areas for improvement.

# **Unit II:**

## **Statistical Process Control (SPC)**

- The seven tools of quality
- Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve
- Control Charts for variables and attributes
- Process capability
- New seven Management tools.

# Unit Objectives

- To understand the seven tools of quality.
- To understand Statistical Fundamentals ie Measures of central Tendency and Dispersion, Population and Sample, Normal Curve
- To understand the Control Charts for variables and attributes
- To understand the difference between common and special causes of variations
- To understand the concept of Process capability
- To understand the New seven Management tools and their applications

# 7 BASIC TOOLS OF QUALITY

1. Histograms
2. Pareto Charts
3. Cause and Effect Diagrams
4. Run Charts
5. Scatter Diagrams
6. Flow Charts
7. Control Charts

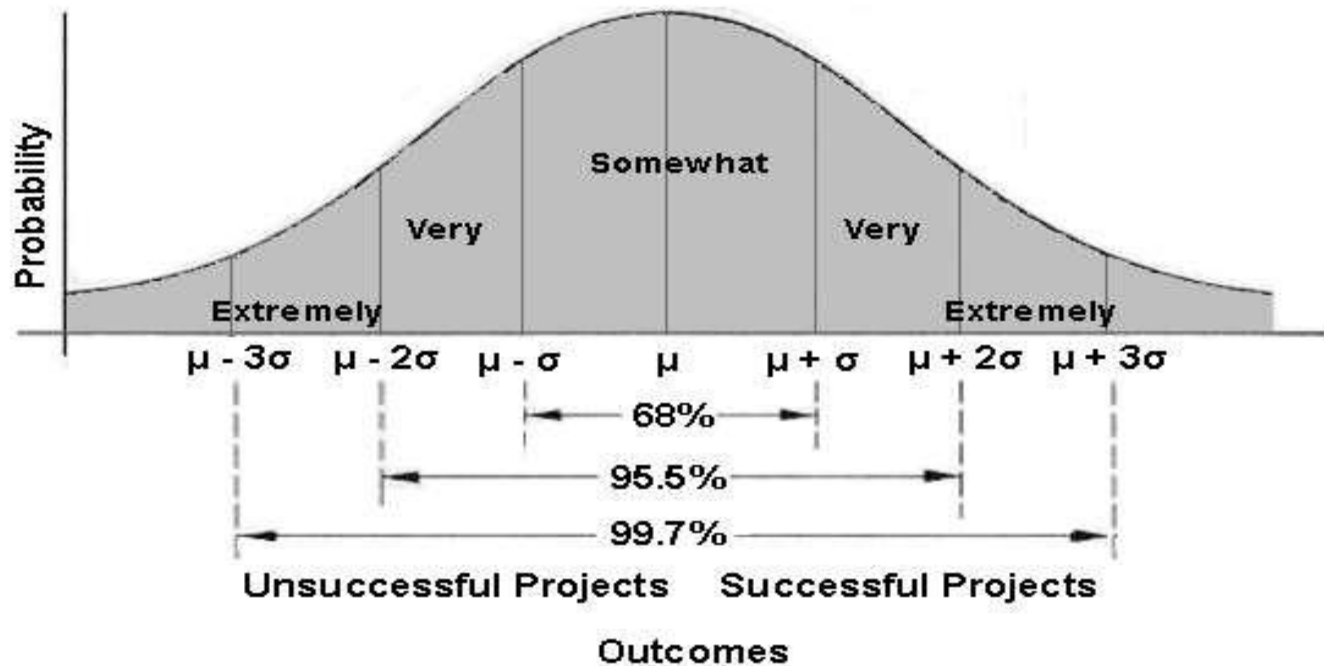
# **STATISTICAL FUNDAMENTALS – MEASURES OF CENTRAL TENDENCY & DISPERSION**

1. Mean
2. Mode
3. Median
4. Range
5. Standard Deviation



# NORMAL CURVE

A theoretical frequency distribution for a set of variable data, usually represented by a bell-shaped curve symmetrical about the mean. Also called Gaussian distribution.



# PROCESS CAPABILITY

**Process capability is the ability of a production process to meet the design specifications for a product or a service or to produce products within the desired expectations of customers.**

**The process capability calculation is based on:**

The mean of the sample.

The standard deviation of the sample.

The known characteristics of the distribution.

$$\text{Process capability ratio} = \frac{(\text{USL} - \text{LSL})}{(6 * \rho)}$$

# POPULATION & SAMPLE

Population: the universal set of all objects under study.

A large population may be impractical and costly to study, collecting data from every member of the population.

Sample: Any subset of the population.

A sample is more manageable and easier to study.

- ✓ **After collecting and organizing the data, a summary is made such as average values.**
- ✓ **Hopefully valid conclusions can be made on the whole population based on the sample data.**
- ✓ **Therefore it is important that the sample data collected be representative of the population.**
- ✓ **Otherwise conclusions may be invalid.**

# Seven New Management and Planning Tools

Affinity diagram

Relations diagram

Tree diagram

Matrix diagram

Matrix data analysis

Arrow diagram

Process decision program chart (PDPC)

# AFFINITY DIAGRAM

It organizes a large number of ideas into their natural relationships

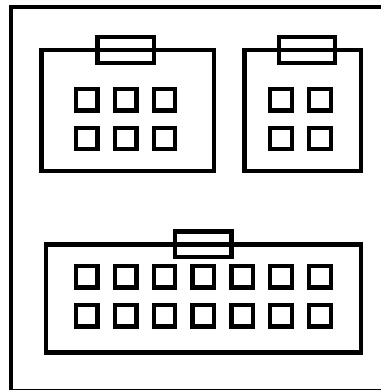
The affinity diagram organizes a large number of ideas into their natural relationships.

This method taps a team's creativity and intuition. It was created in the 1960s by Japanese anthropologist Jiro Kawakita.

When you are confronted with many facts or ideas in apparent chaos

When issues seem too large and complex to grasp

When group consensus is necessary

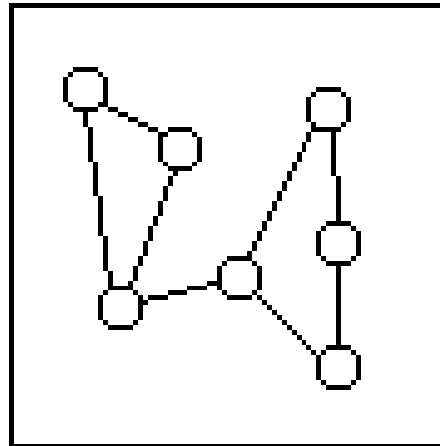


# RELATIONS DIAGRAM

It shows cause-and-effect relationships and helps you analyze the natural links between different aspects of a complex situation.

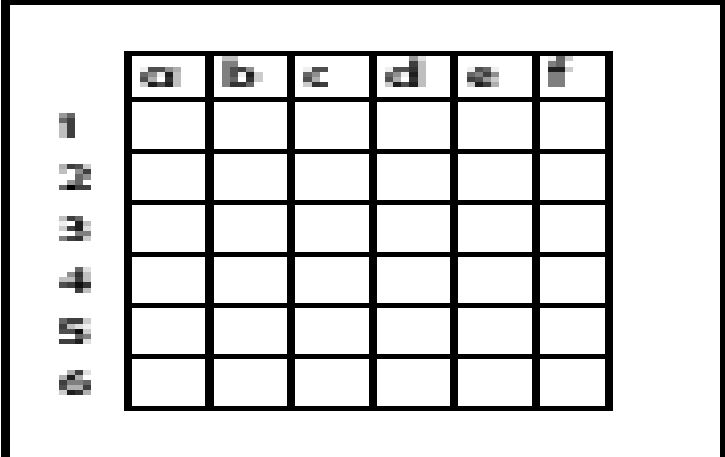
The relations diagram shows cause-and-effect relationships. Just as importantly, the process of creating a relations diagram helps a group analyze the natural links between different aspects of a complex situation.

When trying to understand links between ideas or cause-and-effect relationships, such as when trying to identify an area of greatest impact for improvement.



# MATRIX DIAGRAM

- It shows the relationship between two, three or four groups of information.
- It also can give information about the relationship, such as its strength, the roles played by various individuals or measurements



A matrix diagram consisting of a 6x6 grid. The rows are labeled 1 through 6 on the left side, and the columns are labeled a through f on the top side. The grid is empty, representing a relationship matrix between the rows and columns.

	a	b	c	d	e	f
1						
2						
3						
4						
5						
6						

# ARROW DIAGRAM

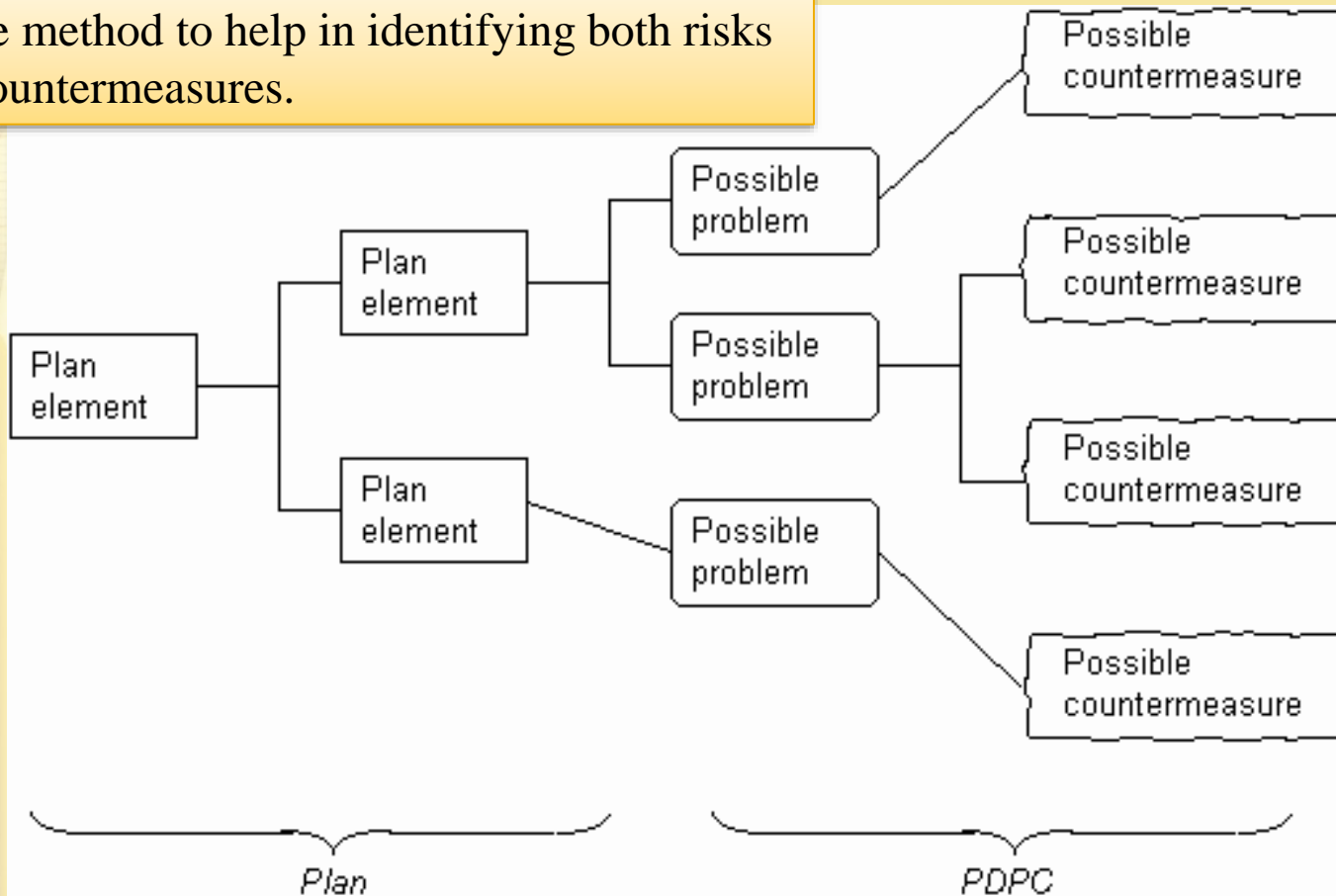
Arrow diagram shows the required order of tasks in a project or process, the best schedule for the entire project, and potential scheduling and resource problems and their solutions.



# PROCESS DECISION PROGRAM CHART (PDPC)

- ◎ systematically identifies what might go wrong in a plan under development.

simple method to help in identifying both risks and countermeasures.



# Assessment Questions

Question: differentiate between Variables and Attributes.

Variables	Attributes
Variables are measurable	Attributes are countable
Types of data: Length, Volume, time	Type of Data: No. of defects, No. of defectives
Example: Width of wire	Example: Defective pens
Use X bar chart and R chart	Use P and C chart

# References

TOTAL QUALITY MANAGEMENT-Text and Cases

By: K. Shridhara Bhat

Himalaya Publishing House