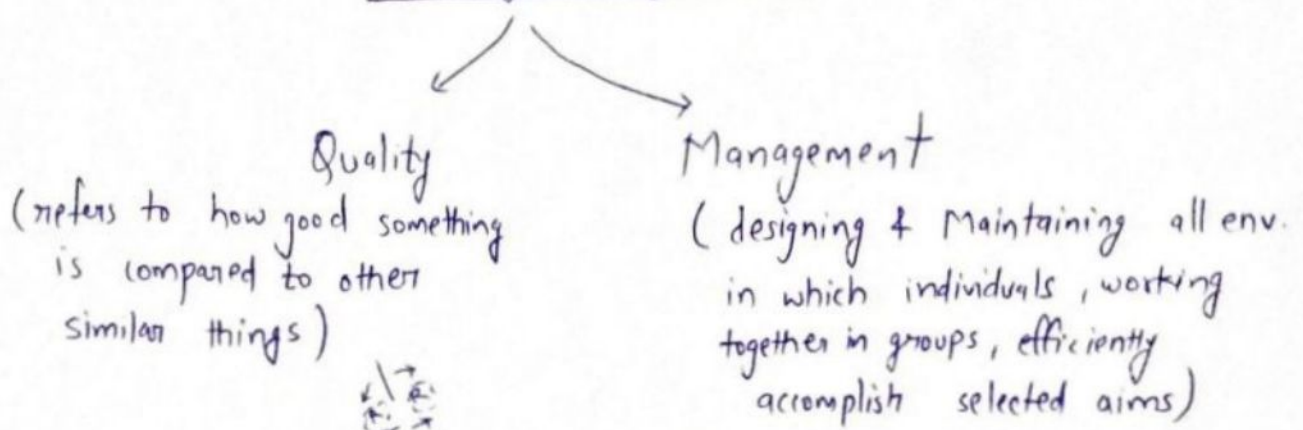


# Quality Management

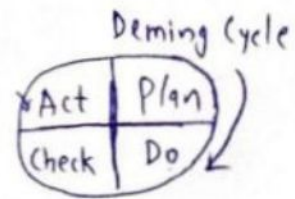


QM :- It is the act of assessing all activities & tasks that must be accomplished to maintain a desired level of excellence.

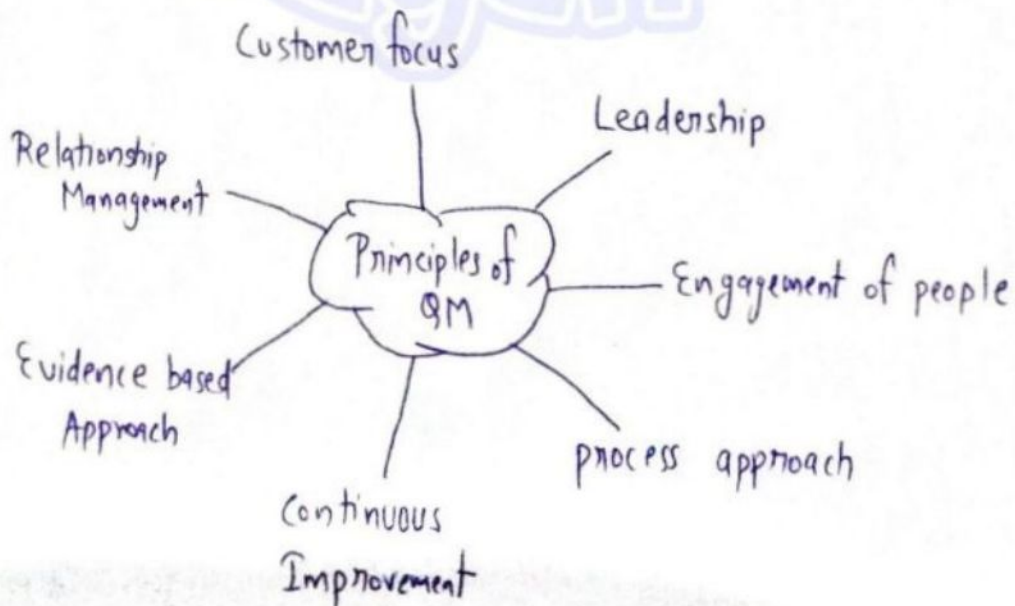
This includes the determination of Quality policy, creating & implementing quality planning & assurance & quality control & quality improvement.

## Components of QM :-

1. Quality Planning
2. Quality Improvement
3. Quality control
4. Quality Assurance



## Principles of QM :-

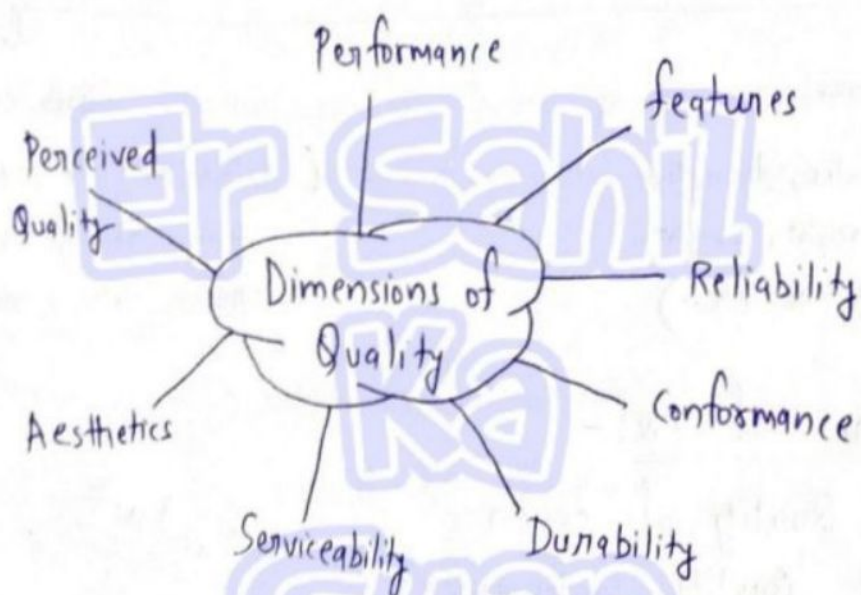


Service Quality:- It measures how well a service is delivered compared to customer expectations. Business that meet or exceed expectations are considered to have high service quality.

Service Quality was seen as having 2 basic dimensions:

Technical Quality:- When customer receives as a result of interactions with service firm.

Functional Quality:- How customer receives service; the expressive nature of service delivery.



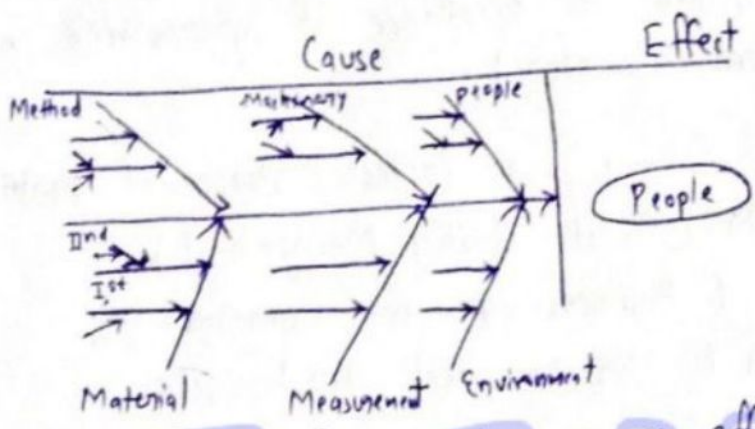
Cost of Quality:- It is a methodology used to define & measure where & what amount of an organization's resources are being used for prevention activities & maintaining produced quality as opposed to the costs resulting from internal & external failures.

$$CoQ = CoGrQ + CoPQ$$

CoQ can be divided into 4 categories:-

1. Prevention } → CoGrQ
2. Appraisal } → CoGrQ
3. Internal failure } → CoPQ
4. External failure } → CoPQ

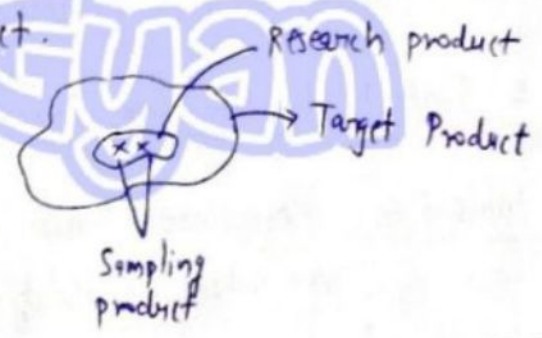
1. Cause & Effect Diagram:- It is also known as fishbone diagram. It shows relationship of all factors (Causes) that lead to the given situation (effect). It identifies major causes & breaks them down into sub-causes.



Purpose:-



- Identifies various causes effecting a process
- Helps groups in reaching a common understanding of a problem.

Sampling:- It is the selection of a set of elements from a target population on product. Sampling is frequently used because gathering data on every member of a target population on every product.



Sampling distribution:- It is a probability distribution of a given random-sample based statistic.

Hypothesis Testing:- choice is made b/w null & alternative based on info. in sample.

→ population   
 → sample 



- (i) Null Hypothesis → 20% from previous result (same)
- (ii) Alternative Hypothesis → difference b/w parameter & specific value.

Single :- A plan in which inspector is forced to make a decision concerning acceptability of a lot or batch on basis of inspection of units in one sample taken.

→  $N$ , lot size      →  $n$ , sample size      →  $c$ , acceptance no.

Double :- They are characterised by 2 sample size along with 2 sets of acceptance rejection no.

Multiple :- 3 or more before decision is reached regarding (ACT)

Sequential :- Decision is made after each item is inspected concerning whether lot should be accepted or rejected or sampling continued.

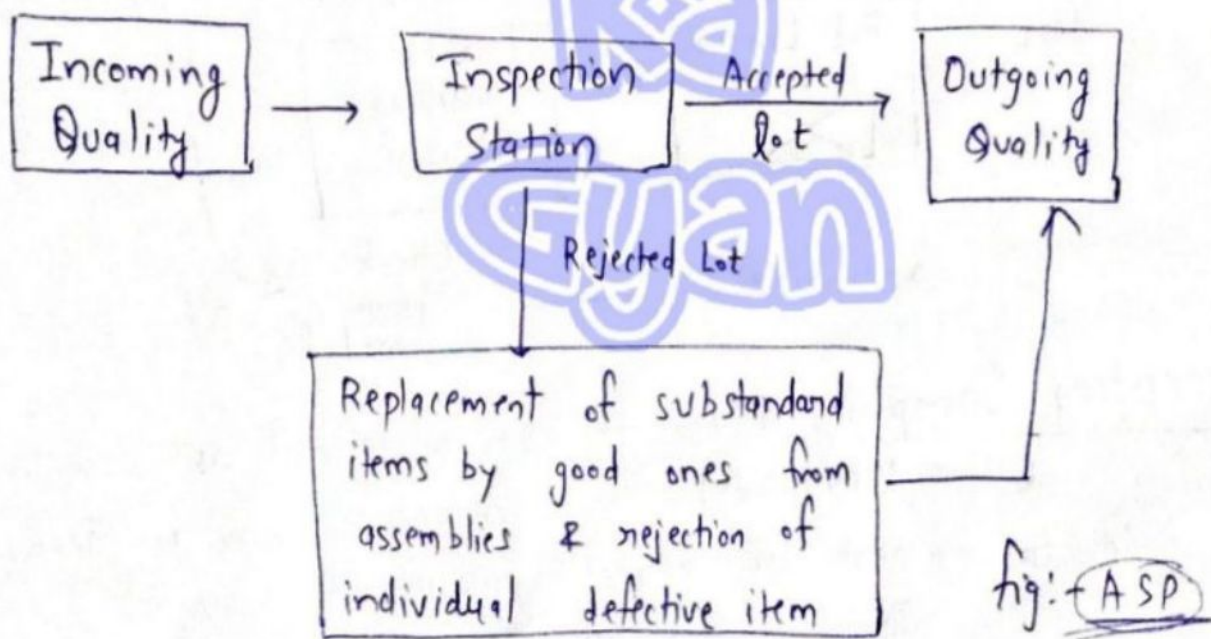


fig: ASP

Total Quality Management (TQM) :-

→ Designed to improve quality at every level.

→ The process to produce a perfect product by series of measures require an organized effort by entire company to prevent or eliminate errors at every stage in production is called TQM.

★ Lean and JIT Quality philosophy:-

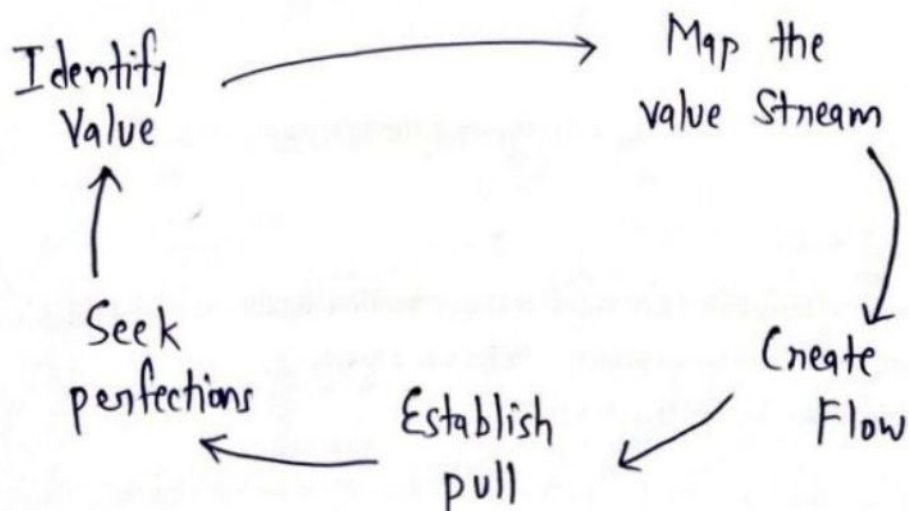
Lean :- Lean was originally created by Toyota to eliminate waste and inefficiency in its manufacturing operations.

→ QM topics like Six Sigma, DMAIC and Jidoka are important in the context of lean manufacturing because the ultimate goal is to eliminate waste in the value stream and one of the most common types of waste is connection waste.

→ Connection waste happens when it is necessary to work around poor quality in components from suppliers or it is necessary to repair, rework or scrap defective product units.

So lean can improve how a team works together, inventory management, and even client interaction.

→ 5 key Principles of lean thinking:-



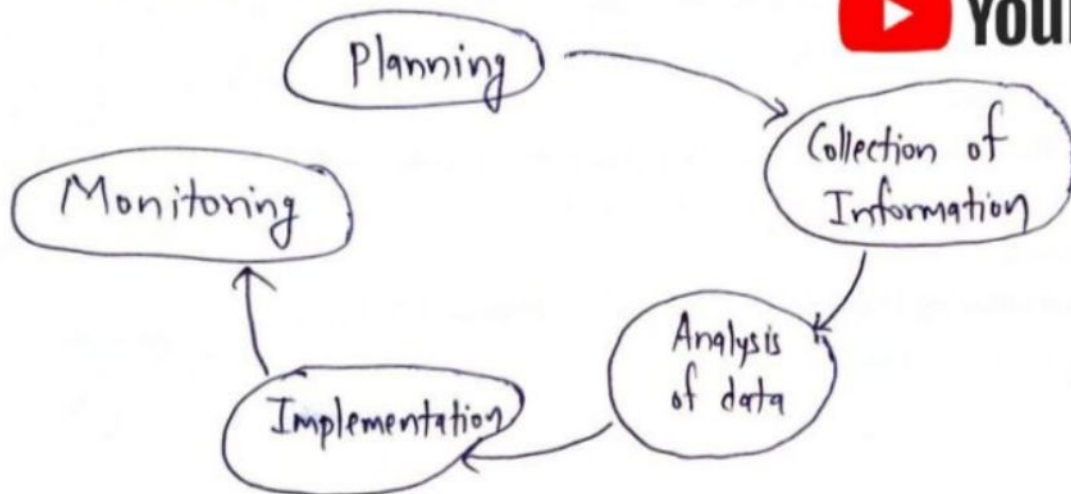
Benchmarking is the process of comparing the cost, cycle time, productivity or quality of a specific process or method to another that is widely considered to be an industry or best practice.

- "Benchmarking is quality by comparison for achieving better."
- Benchmarking provides a snapshot of the performance of your business.

Er Sahil ka Gyan



process of benchmarking:-



(i) Planning:- Identify the product, service or process to be benchmarked.

(ii) Collection of information:- Information can be divided in sub texts of primary and secondary data.

primary data → directly from benchmarked company.

Secondary data → gathered from press, publication or websites.

(iii) Analysis of data:- Compare the current performance and benchmarked data & analyse the difference.

(iv) Implementation:- It becomes mandatory to walk the talk and at the time we improve quality and fulfill the current & benchmarked data.

## \* ISO 9000 Series :-

- It is defined as a set of international standards on quality management and quality assurance developed to help companies effectively document the quality system elements needed to maintain an efficient quality system.
- It is a series, or family, of quality management standards.

\* ISO 9001:2015 : QMS - Requirements

ISO 9000:2015 : QMS - Fundamentals & Vocabulary

ISO 9004:2018 : Quality Management - Quality of an Organization

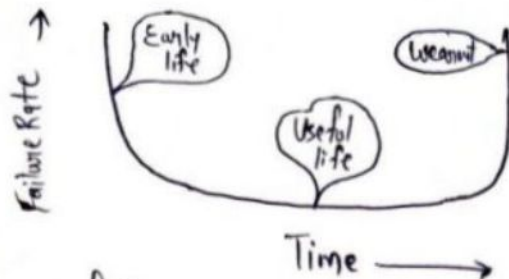
ISO 19011:2018 : Guidelines for Auditing Management Systems

→ ISO 9000:2015 and ISO 9001:2015 standards are based on 7 Quality Management Principles that senior management can apply to promote organizational improvement.

We can measure it or better it and predict it by the famous Bathtub Curve.

### Famous Bathtub Curve :-

Instantaneous failure rate vs time



(i) Early life :- If we follow the slope from the leftmost slot to where it begins to flatten out this can be considered the first period. The first period is characterised by a decreasing failure rate. It is what occurs during the "early life" of a population of units. The weaker units fail leaving a population that is more rigorous.

(ii) Useful life :- The next period is the flat bottom portion of the graph. It is called the "Useful life" period. Failures occur more in a random sequence during this time. It is difficult to predict which failure mode will occur but the rate of failure is predictable. Notice the constant slope.

(iii) Wearout :- The third period begins at the point where the slope begins to increase & extends to rightmost end of graph. This is what happens when units become old & begin to fail at an increasing rate. It is called "wearout" period.



## Quality Circles:-

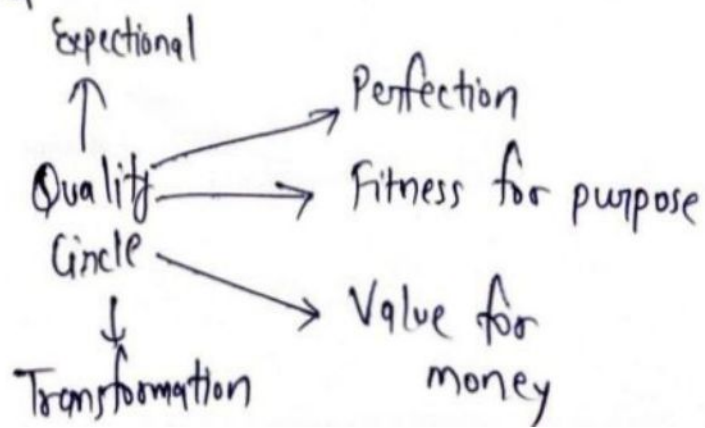
A quality circle or quality control circle is a group of workers who do the same similar work, who meet regularly to identify, analyze and solve work-related problems. It consists of minimum three and maximum 12 members in number.

### Objective of QC:-

- Improvement in quality of product, in methods of production
- Development of employee participating in QC.
- Promoting morale of employees.
- Respect humanity & Create a happy work place worthwhile to work.

### Main features of QC :-

- (i) Voluntary Groups
  - (ii) Small Size
  - (iii) Regular Meeting
  - (iv) Independent Agenda
  - (v) Quality focused
- } desc.



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