QUALITY MANAGEMENT

PROF P. C. JHA

DEPARTMENT OF OPERATIONAL RESEARCH

UNIVERSITY OF DELHI

KAIZEN- CONTINUOUS IMPROVEMENT

Concept of Kaizen

- Kaizen is a system of continuous improvement in quality, technology, processes, company culture, productivity, safety and leadership.

- The word Kaizan means “continuous improvement”. It comes from the Japanese words 改 ("kai") which means "change" or "to correct" and 善 ("zen") which means "good".

- A system that involves every employee - from upper management to the cleaning crew.

- Everyone is encouraged to come up with small improvement suggestions on a regular basis.

- This is not a once a month or once a year activity. It is continuous.

In Japanese companies, such as Toyota and Canon, a total of 60 to 70 suggestions per employee per year are written down, shared and implemented.

In most cases, these are not ideas for major changes.

Based on making small changes on a regular basis.

Focuses on making changes in any area where there is a scope for improvement.
Consists of collection of Japanese practices and includes:
Customer orientation, Total quality control, Robotics, QC circles, Suggestion systems, Automation, Discipline in workplace, Total productive maintenance, Kanban, Just in time, Zero defects, New product development, Small group activities, Statistical quality control and Cooperative labour-management relations.

The essence of all of the above practices can be reduced to one word- KAIZEN.
Involves setting standards and then continually improving those standards to support the higher standards.

Also involves providing the training, materials and supervision that is needed for employees to achieve the higher standards and maintain their ability to meet those standards on an on-going basis.

Kaizen (Continuous Improvement)

5 Principles

GETTING STARTED WITH KAIZEN

Some of the micro-level techniques for implementing Kaizen are:

- Involved and committed employees who use common sense and creativity.
- Various types of check sheets or checklists.
- Active use of the **seven quality control tools**- Pareto chart, cause-and-effect diagram, histograms, Control charts, Scatter diagram, Check sheets, Graphs, etc.
- Systematic questioning techniques like **5W1H** (What, When, Where, Why, Whom and How).
- Concept of the **Deming Wheel (PDCA)** and **poka-yoke** methods.
- Use of Simply, Combined, Add and Automate, Re-arrange, Eliminate **(SCARE)** principle.
- Elimination of **muda, mura and muri** along with **5S**.
- Group dynamics.
- Principles of **standardization** and **visual management**.

The 5 W and 1 H of Kaizen

Who?	What?	Where?
1. Who does it? 2. Who is doing it? 3. Who should be doing it? 4. Who else can do it? 5. Who else should do it? 6. Who is doing 3-Mus?	1. What to do? 2. What is being done? 3. What should be done? 4. What else can be done? 5. What else should be done? 6. What 3-Mus are being done?	1. Where to do it? 2. Where is it done? 3. Where should it be done? 4. Where else can it be done? 5. Where else should it be done? 6. Where are 3-Mus being done?
When?	**Why?**	**How?**
1. When to do it? 2. When is it done? 3. When should it be done? 4. What other time can it be done? 5. What other time should it be done? 6. Are there any time 3-Mus?	1. Why does he do it? 2. Why do it? 3. Why do it there? 4. Why do it then? 5. Why do it that way? 6. Are there 3-Mus in the way of thinking?	1. How to do it? 2. How is it done? 3. How should it be done? 4. Can this method be used in other areas? 5. Is there any other way to do it? 6. Are there any 3-Mus in the method?

Concept is proposed by Masaaki Imai, chairman of Kaizen institute.

Gemba in japanese means "real place", or place where real action occurs

Problem with most managers is that they prefer their desk to be their workplace, and wish to distance themselves from the events taking place in gemba.

The report from gemba is merely their secondary information.

The managers should go to the gemba and observe the situation.

FIVE GOLDEN RULES OF GEMBA KAIZEN

- **Go to the Gemba-** When there is a problem, it is the manager's responsibility to go to the gemba first.

- **Check Gembutsu - (item at Gemba)**- If a machine is down (the machine itself is the gembutsu), go to the gemba and have a look at the machine.

- **Take temporary measures on the spot**- To begin with, take temporary countermeasures on the spot to solve the problem.

- **Find root cause & kill**- If any problem occurs, go to the root cause by repeating the question "Why" several times.

- **Standardize to prevent recurrence**- once you identify the root cause and come up with appropriate measures, you should standardize such a measures so that the same problem will not recur.

MAJOR TOOLS OF GEMBA KAIZEN

One major tool of gemba Kaizen is **waste elimination**.

There are three types of wastes- ***muda, muri and mura***.

Gemba Kaizen is the process of identifying, reducing and eliminating ***muda, muri and mura*** from the gemba.

Muda :

In Japanese means work without a product or effort wasted.

Any wasteful activity or any obstraction to the smooth flow of an activity.

Activity = Work + Muda

Expenditure = Cost + Waste

Each activity is associated with a cost. Any expenditure on the ***muda*** is a waste. Therefore, less ***muda*** equals happier clients.

VARIOUS TYPES OF MUDA ARE AS FOLLOWS:

- **Muda of overproduction-** If you produce more than your customer needs, you have extra pieces that need to be taken care of and expenses for handling and keeping stock.
- **Muda of inventory-** Result of overproduction. If you process only those products that the next process needs, you can eliminate the muda of inventory altogether.
- **Muda of motion-** No value addition takes place when operators simply move around looking for tools or going to get the work pieces.
- **Muda of waiting-** No value is added when there is a long waiting period.
- **Muda of transportation-** No value addition is made when materials are moving on the trucks, forklifts or on the conveyor.
- **Muda of producing rejects-** Producing rejects leads to rework, or else rejects must be thrown away and this is indicative of a big muda.
- **Muda of processing-** By rearranging the working sequence, one can often eliminate a particular process.

Concept of *muda elimination* is central to Kaizen, since elimination does not cost any money.

Muri:

Refers to an overburdened system.

This leads to physical strain at the workplace such as bending to work, pushing hard, lifting weight, repeating tiring action and wasteful walk.

Mura:

Refers to the unevenness in the flow of work.

It relates the inconsistencies in the system.

LEAN

A business philosophy developed by Taiichi Ohno in 1990's with particular focus on manufacturing firm.

Applied in various organizations to improve their business and reduce waste (remove *muda*).

Seven types of waste - overproduction, wasting time, resources, transportation, processing, inventory and motion.

Elimination of waste improves quality while reducing costs and the time

required for production.

Fundamental Lean Management Principles

1. Specify what creates value from the customer's perspective.
2. Identify all the steps in the processes chain.
3. Make those processes flow.
4. Make only what is pulled by the customer.
5. Strive for perfection by continually removing wastes.

More on LEAN

- To apply concept of LEAN in any organization, it should be understood well by all personnel in the organization.
- Waste can be eliminated by standardizing work, workplace, quality, etc.
- Concept should be implemented from the top and then go on to employees at all levels.
- Ford, Toyota and Boeing are companies that have used Lean techniques and are known as best innovators in industry.
- Originally developed by Taiichi Ohno of Toyota Motor Company in Japan based on concepts pioneered by Henry Ford.

- Ford started using Lean manufacturing principles in all its operations in 1981.

- This requires significant human and financial resources.

- Apart from using advanced technologies, Ford was successful in making its employees work together in groups, take swift decisions while avoiding wastage of time.
- He was able to effectively increase operations, eliminate waste and improve financial position.
- Ford transforms itself from a mass production system to a Lean manufacturing system.
- Lean is result of involvement of all departments of organization.
- It is no longer exclusive to manufacturing firms.
- Same concepts can be applied to non manufacturing firms, healthcare, pharmaceuticals, banks, etc.

BUILDING BLOCKS OF LEAN

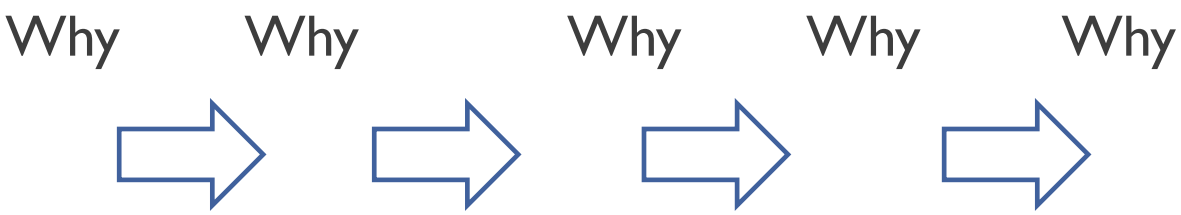
- **Visual controls:** Placement of plain view of all necessary information.
- **Streamlined layout:** A layout designed according to optimum operational sequence.
- **Standard work:** Consistence performance of task.
- **Batch-size reduction:** Reduce batch to smallest size possible.
- **Teams:** Emphasis is on working in team.
- **Quality at source:** Refers to inspection & process control by employees.
- **Point of use storage:** Raw materials, parts information, tooling work standards, suppliers, producers, etc are stored where needed.

- **Quick changeover: A**bility to change tooling and fixing rapidly
- **Pull/kanban**: System of cascading production and delivery instructions from downstream to upstream activities in which the upstream supplier does not produce until the downstream customer signals a need using Kanban system.
- **Kanban system** is designed to prevent overproduction by ensuring that each stage produces only as much as the next stage needs.
- **Cellular/flow**: Physically linking and arranging manual and machine process steps into the most efficient combination to maximize the value added while minimizing waste.
- **Total productive maintenance (TPM)**: A lean equipment maintenance strategy for maximizing overall equipment effectiveness.

It can be confirmed whether the expected improvement has taken place or not only if correct and appropriate tools of measurement are used.

- **Seven quality control tools**: Tools used for continuous improvement.

- **5 –Why Analysis**: The why concept



- **PDCA cycle (Plan-Do-Check-Act)**: Particularly focused on continuous improvement. After a process is successfully improved, only then it is time to move on to next process.

- **Customer surveys**: Suggestions for improvement of both internal and external customers must be recorded

- **Employee suggestions**: Be receptive to your employees suggestions. Empower your employees

- **Brainstorming**: Conduct brainstorming sessions. Make sure to involve all employees regardless of their positions

- **Benchmarking**: Identify the organizations you want to benchmark against

Benefits of Kaizen

Reduces Waste in areas such as inventory, waiting times, transportation, worker motion, employee skills, over production, excess quality and in processes.

Improves space utilization, product quality, use of capital, communications, production capacity and employee retention.

Provides immediate results.

Instead of focusing on large, capital intensive improvements, **Kaizen focuses** on creative investments that continually solve large numbers of small problems.

Large, capital projects and major changes will still be needed, and Kaizen will also improve the capital projects process, but the real power of Kaizen is in the on-going process of continually making small improvements that improve processes and reduce waste.

For example:

In 1999 at one US plant, 7000 Toyota employees submitted over 75,000 suggestions, of which 99 % were implemented.

These continual small improvements add up to major benefits.

Result in improved productivity, improved quality, better safety, faster delivery, lower costs and greater customer satisfaction.

On top of these, employees working in Kaizen based companies generally find work to be easier and more enjoyable, thus resulting in higher employee satisfaction and lower turnover.

What Is The 5S

Forms the foundation of kaizen.

A key component in establishing a visual workplace.

In a **visual workplace**, visual devices are positioned at the point of use, giving employees instant access to the critical information they need, right when they need it.

Visuals can easily be understood at a glance, eliminating the wasted downtime that had previously been spent searching, asking, or waiting for information.

This model can greatly improve your productivity, cost, quality, on-time delivery, inventory and equipment reliability.

Name stands for 5 Japanese words – Seiri, Seiton, Seiso, Seiketsu and Shitsuke

5-S CONTINUED…

Focuses on implementing visual order, organization, cleanliness and standardization.

A technique to establish and maintain total quality environment.

Not only improves the physical environment, but also improves thinking process.

Both a part of kaizen and lean manufacturing.

Results expected from a 5S program are improved profitability, efficiency, service and safety.

THE 5 S ARE LOOSELY TRANSLATED AS FOLLOWS:

Sort: Sort out & separate that which is needed & not needed in the area.

Straighten: Arrange items that are needed so that they are ready & easy to use. Clearly identify locations for all items so that anyone can find them & return them once the task is completed.

Shine: Clean the workplace & equipment on a regular basis in order to maintain standards & identify defects.

Standardise: Revisit the first three of the 5S on a frequent basis and confirm the condition of the Gemba using standard procedures.

Sustain: Keep to the rules to maintain the standard & continue to improve every day.

Logic behind 5 S practices is that organization, neatness, cleanliness, standardization and discipline at workplace are basic requirements for producing high quality products and services with little or no waste and with high productivity.

	Japanese	English	Meaning
1S	Seiri	Structurize/Sorting	•Organization •Distinguishes between necessary and unnecessary items •Putting things in order
2S	Seiton	Systemize/Systematic arrangement	•Keeping necessary things in designated place
3S	Seiso	Sanitize/Cleaning	•Making things clean •Keeping the workplace spic & span
4S	Seikestu	Standardization	•Standardization of 1S, 2S & 3S
5S	Shitsuke	Self-discipline	•To respect & cultivate standards

Implementation Strategy for 5-S

- Create awareness through workshops for all members.
- Form the team and assign ownership areas.
- Equip the team with tools and techniques.
- Implement the step-by-step manner.
- Carry out three level audits regularly.
- Proceed to the next step only after completing the previous step satisfactorily.
- Use a model area and implement all the 5S practices.

BENEFITS OF 5-S WORKPLACE ORGANIZATION

All types of business benefit from having a 5-S programme in place.

Manufacturing and industrial plants realize the greatest benefits.

Benefits of implementing a 5-S programme are:

1. Builds a culture for creating a neat, safe, healthy and clean workplace with a conducive environment.

2. Systemizes day to day working and improves work efficiency.

3. Inspires associates to maintain discipline in workplace and also motivates them to carry home good practices by which their family members are also benefited.

KAIZEN VERSUS INNOVATION

Innovation is seen as a major change in the wake of technological breakthroughs.

Innovation is dramatic and real attention getter.

Kaizen, on the other hand, is often undramatic and subtle, and its results are seldom immediately visible.

Innovation is generally a one shot phenomenon, whereas Kaizen is a continuous process that implies continuous improvement.

	KAIZEN	INNOVATION
1. Effect	Long-term and continuous, but undramatic	Short-term, but dramatic
2. Speed	Small steps	Big Steps
3. Timeframe	Continuous and rising	Interrupted and limited
4. Chances of success	Always on a high level	Abrupt and unsettled
5. Protagonists	Every single employee	The chosen few
6. Approach	Collective spirit, teamwork, system	Individual ideas and efforts, ruthless
7. Motto	Preservation and improvement	Demolition and reconstruction
8. Recipe for success	Conventional Know How and todays state of the art	Technological achievements, new inventions, new theories
9. Practical preconditions	Small investment, big effort to preserve the status quo	Big investment, small effort to preserve the status quo
10. Success orientation	Men	Technology
11. Criteria for evaluation	Performance and Processes for better results	Profit
12. Advantages	Best suited for slow growing economies	Best suited for fast growing economies

Company-Wide Quality Control (CWQC)

- The concept of TQC were introduced to Japan during 1960.
- JUSE synthesized the concepts, principles, and approaches of statistical process control and total quality control.
- During this period, Japanese industries realized the concepts of TQC. All the departments and employees, from the operators, first-line supervisors, engineers, managers, and top managements, participated in the quality programs and activities. Thus, we called this Japanese TQC as company-wide quality control (CWQC).
- The realization of CWQC led Japanese industries to possess core competitiveness and quickly move into western markets that were once dominated by western companies by providing the customers with high quality products at lower prices.
- This situation caused American and western industries to benchmark Japanese CWQC performance and learned the management of quality control from Japan. As a result, total quality management (TQM) was developed and widely adopted by the industries around the world.
- Company-Wide Quality Control is roughly equivalent to the Japanese Total Quality Control (TQC). In Japan, "control" has the same meaning as "management" in the US. Thus, CWQC roughly equals TQM.

SALIENT FEATURES OF CWQC

It signifies a statistical and systematic approach for Kaizen and problem solving.

Company-wide quality control with the participation of all employees.

Emphasis on education and training

Quality control circle activities

CWQC audits as exemplified by the Deming prize audit

Application of statistical methods

Nationwide CWQC promotion

CHARACTERISTICS OF CWQC

Quality before profit

Consumer-oriented quality control, not producer-oriented quality control

The next process is the customer

Application of statistical methods

Cross-functional management

CWQC starts with training and end with training (Aim of various training programmes is to instill CWQC thinking in all employees)

KAIZEN- THE PRACTICE

It can be broken in three segments:

Management-oriented kaizen- The management should direct its effort to systems improvement as one of the most important tasks.

Group-oriented kaizen- It is represented by small group activities such as quality control circles that use various tools to solve problem.

Individual-oriented kaizen- The suggestion system is an integral part of individual-oriented kaizen.

MANAGEMENT ORIENTED KAIZEN

- Considered as first pillar of Kaizen.
- Concentrates on most important logistic and strategic issues and provides momentum to keep up progress and morale.
- As per Japanese management, a manager should spend at least 50 % of his time on system improvement.
- Systems improvement concerns crucial areas of management as planning and control, decision making processes, organization and information systems.
- Where the management has failed to establish such a system, and has instead directed its efforts randomly in bits and pieces, success has been short lived.

GROUP ORIENTED KAIZEN

- Small group activities may be defined as informal voluntary small groups organized within the company to carry out specific tasks in the workshop.
- Examples are: QC circles, mini think tanks, suggestion groups , safety groups, etc.
- Small groups are formed for the purpose of stimulating cross development among its members.
- Advantages are:
  - Strengthens sense of teamwork
  - Communication between labour and management is improved
  - Morale is improved
  - Workers acquire new skills and knowledge
  - Group solves problems that would otherwise be left to management.

INDIVIDUAL ORIENTED KAIZEN

- Suggestion system is an integral part of this.
- Management attention is essential if workers are to become 'thinking workers', always looking for better ways to carry out their work.
- Management should assure that suggestion system is dynamic.
- Some examples of suggestions are:
  - Improvement in one's own work
  - Savings in energy, materials and other resources
  - Improvement in working environment
  - Ideas for new product
  - Customer service and customer relation

QUALITY FUNCTION DEPLOYMENT (QFD)

- A useful tool for translating the voice of the customer into specific technical requirements
- Initiated by Dr. Mizuno, Professor Emeritus, Tokyo Institute of Technology
- Employed to translate customer expectations, in terms of specific requirements, into engineering characteristics that can be deployed through product planning, process planning and service planning.
- Consists of series of interlocking matrices that translate customer needs into product and process characteristics.

BENEFITS OF QFD :

- It facilitates identification of the causes of customer complains and makes it easier to take prompt remedial action.
- It is a useful tool for improving product quality.
- It stabilizes product quality.
- It cuts down on rejects and rework at the production centre.
- It decreases claims substantially.

HOUSE OF QUALITY

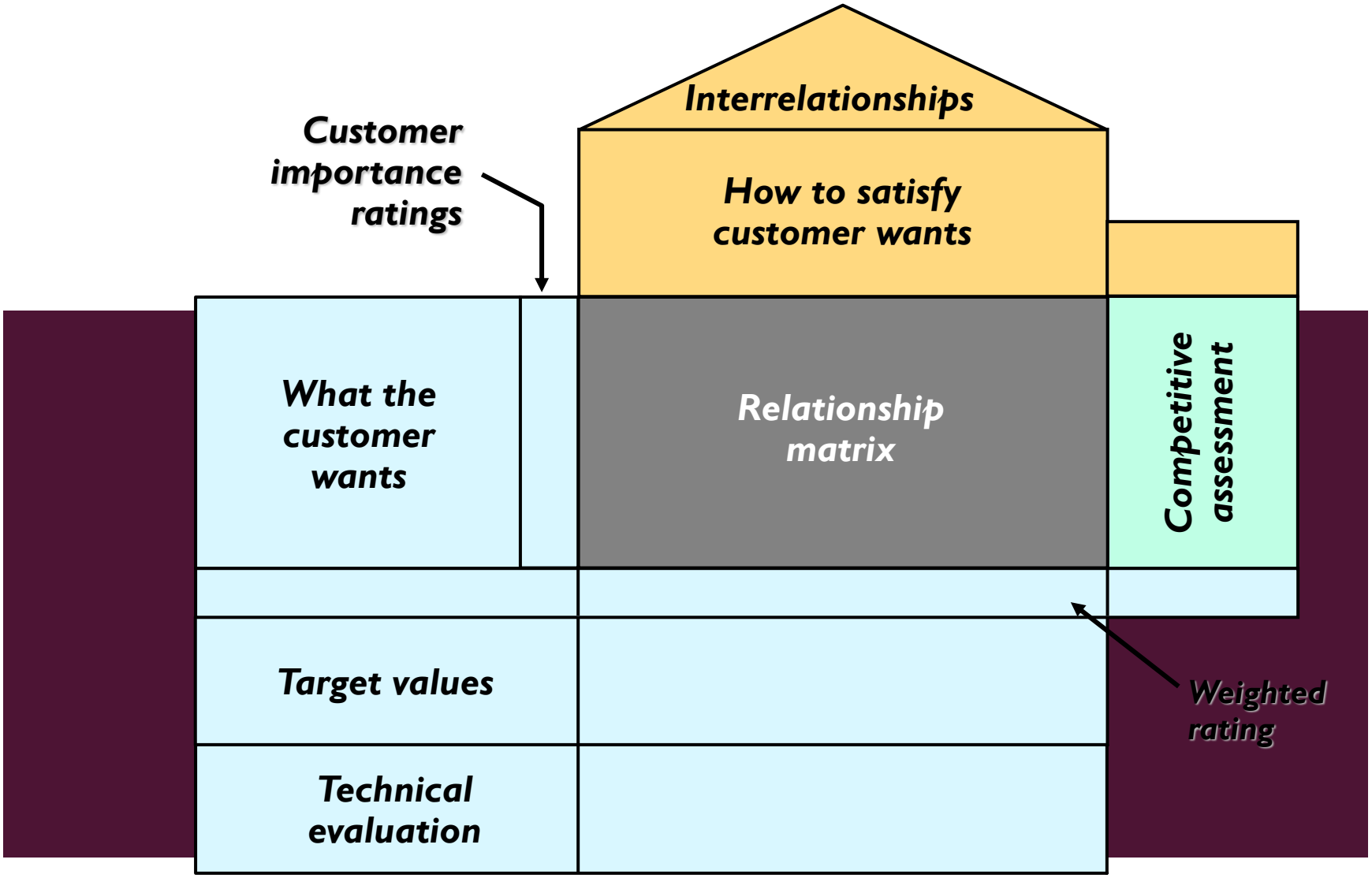
- QFD begins by identifying important customer requirements, which typically come from marketing department.

- These requirements are numerically scored based on their importance, and scores are translated into specific product characteristics.

- Evaluations are then made of how the product compares with its main competitors relative to the identified characteristics.

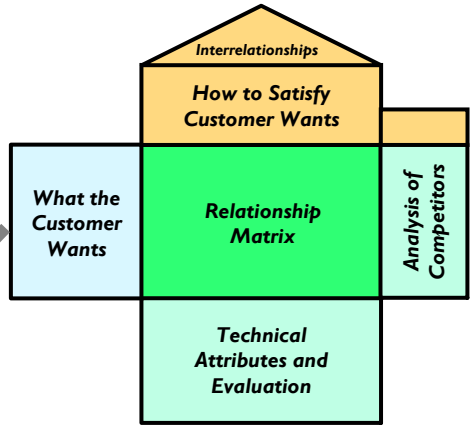
- Resulting matrix looks like a picture of a house and is often called the ***house of quality***.

House of Quality



BUILDING HOUSE OF QUALITY

- List customers requirement
- List technical descriptors
- Compare the relationship between customers requirements and technical descriptors
- Develop an interrelationship between each of the technical descriptors
- Implement competitive assessment
- Develop prioritized customer requirement
- Develop prioritized technical descriptors

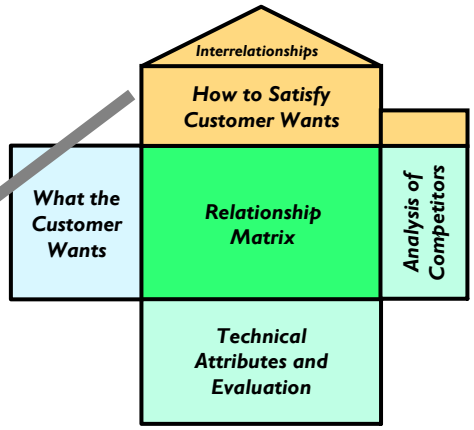


What the customer wants

Customer importance rating (5 = highest)

Lightweight	3
Easy to use	4
Reliable	5
Easy to hold steady	2
Color correction	1

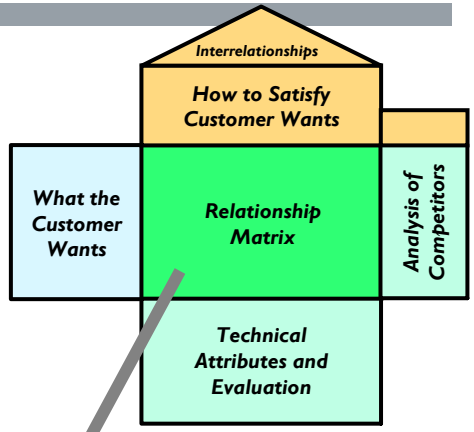
HOUSE OF QUALITY EXAMPLE



Low electricity requirements
Aluminum components
Auto focus
Auto exposure
Paint pallet
Ergonomic design

How to Satisfy Customer Wants

HOUSE OF QUALITY EXAMPLE

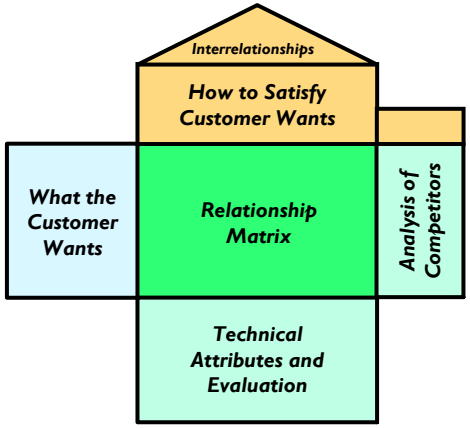


- ◉ *High relationship*
- ◯ *Medium relationship*
- • *Low relationship*

Lightweight	*3*	•	◯				•
Easy to use	*4*	•		◯	◯	◯	◯
Reliable	*5*	◯		◯	◯	◯	
Easy to hold steady	*2*						◉
Color corrections	*1*					◉	

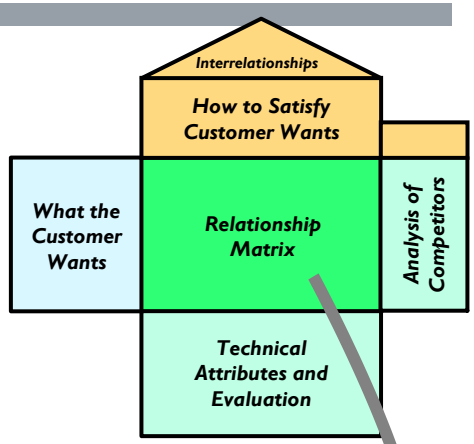
Relationship matrix

HOUSE OF QUALITY



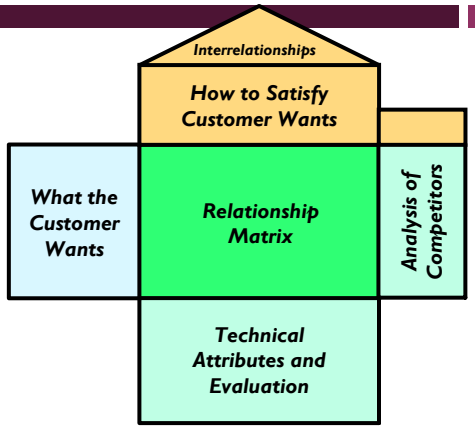
- *Low electricity requirements*
- *Aluminum components*
- *Auto focus*
- *Auto exposure*
- *Paint pallet*
- *Ergonomic design*

Relationships between the things we can do



Lightweight	3	•	○				•
Easy to use	4	•		○	○	○	○
Reliable	5	○		○	○	○	
Easy to hold steady	2						◎
Color corrections	1					◎	
Our importance ratings		22	9	27	27	32	25

Weighted rating



How well do competing products meet customer wants

				Company A	Company B
Lightweight	3	•	•	G	P
Easy to use	4	•		G	P
Reliable	5			F	G
Easy to hold steady	2			G	P
Color corrections	1			P	P
Our importance ratings		22	5		

QUALİTY CONTROL CİRCLES

- Quality circle is a small team of people ususally from same work area who meet on regular basis to identify, investigate, analyze and solve work related problems.
- Concept of Quality Circles originated in Japan.

Idea was presented by Dr. K Ishikawa in April 1962.

- First circle was registered with the Nippon Telegraph and Telephone Public Corporation.
- However, the quality culture concept is well established mostly in ASEAN countries such as Japan, South Korea, China and Taiwan, etc.
- The circle members put their minds together to solve work related problems, and share their ideas with the management.

Concept of Quality Circle

- Based on the concept that suggestions affecting the workplace should come from those who perform the work and who have the greatest knowledge about the job.

- It assumes that a group of individuals working together will come up with a better solution as compared to one individual working alone.

- The quality circle concept consist of three major attributes:
  - QC is a form of participative management
  - QC is human resource development technique
  - QC is a problem solving technique

PHILOSOPHICAL FOUNDATION OF QUALİTY CİRCLES

- Belief that people will take pride and interest in their work if they have autonomy and control over decisions that affect them.
- It helps to develop a sense of belongingness in employs towards the organisation.
- Belief that each employee desires to participate in making the organisation a better place to work.
- Development of their skills, capabilities and creativity through process of education, training and participation.
- A willingness to allow people to volunteer their time and effort for any improvement in the performance of the organization.
- Importance of each member's role in meeting organizational goals.
- An involved and respected employee is a productive employee.

Characteristics of Quality Circles:

- It is group activity.
- It makes work place meaningful.
- It shows concern for the total person.
- It harmonises the work.
- It removes barrier of mistrust.
- It is voluntary.
- It has management's support.
- It is participative.
- It involves task performance.
- It is not a substitute for joint plant councils or work committees.
- It is not a forum to discuss demand or grievances.
- It is not a forum for management to unload all their problems.
- It is not a panacea for all ills.

Objectives of Quality Circles:

- Create problem solving capability
- Build an attitude of problem prevention.
- Reduce errors and enhance quality and productivity
- Improve communication in the organization
- Inspire more effective team work.
- Promote job involvement and participation
- Increase employees' motivation.
- Develop harmonious manager workers' relationship
- Develop greater safety awareness
- Promote cost reduction
- Promote personnel and leadership development
- Catalyse attitudinal changes for greater cohesiveness and teamwork.

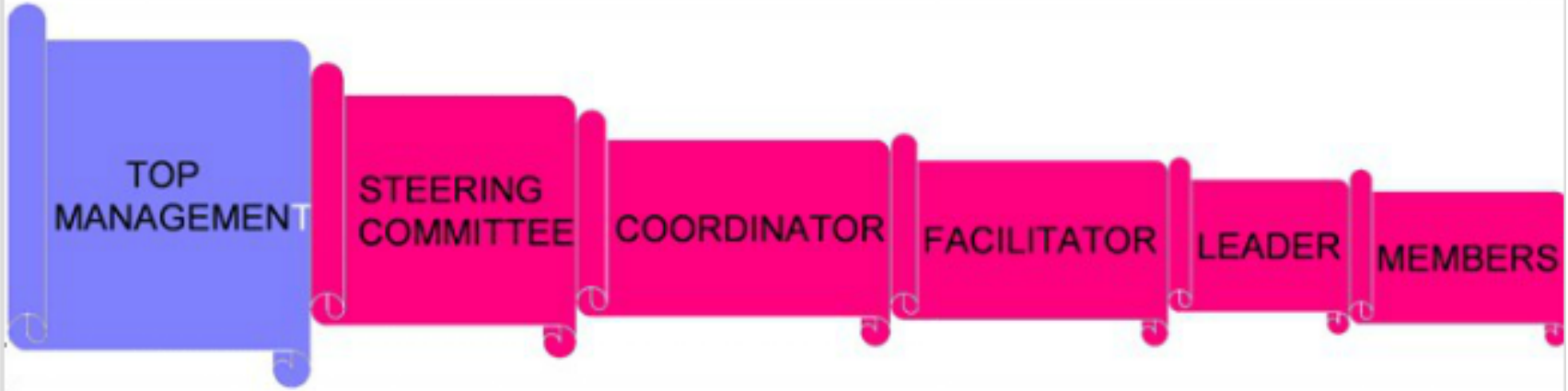
ROLE OF QCC IN MEETING INDIVIDUAL NEEDS

S. NO.	TYPE OF NEED	WAYS IN WHICH THE NEED CAN BE MET THROUGH QC ACTIVITY
1	STIMULATION	QCs provide important ways to stimulate thought and reduce boredom at the workplace
2	SECURITY	Through QCs, employees can demonstrate their value to the organization and improve productivity by making important and necessary contributions to their job.
3	SOCIAL BELONGING	QCs provide an accepted social structure. Team building and acceptance are part of QC training.
4	ESTEEM	Successful QC projects receive recognition and generate respect for the talent and expertise of the individual member and the team as well.
5	SELF ACTUALIZATION	QCs combine opportunities to use knowledge, judgement and creativity with the freedom to decide how to contribute.

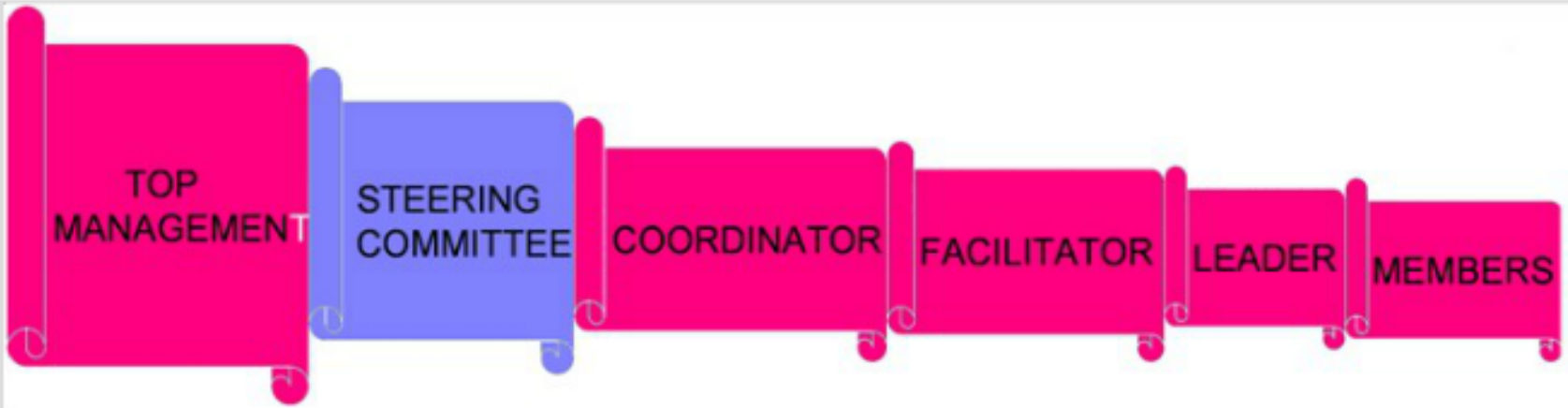
BASIC ORGANIZATIONAL STRUCTURE OF QCC

- A QC should have an appropriate organizational structure for its effective and efficient performance.
- The organizational structure of QC may vary from industry to industry, but it is useful to have basic framework as a model.
- In a typical organization the structure of QC may consist of following elements:
  - A Steering committee
  - Coordinators
  - Facilitator
  - Circle Leader/ Deputy Leader
  - Circle members

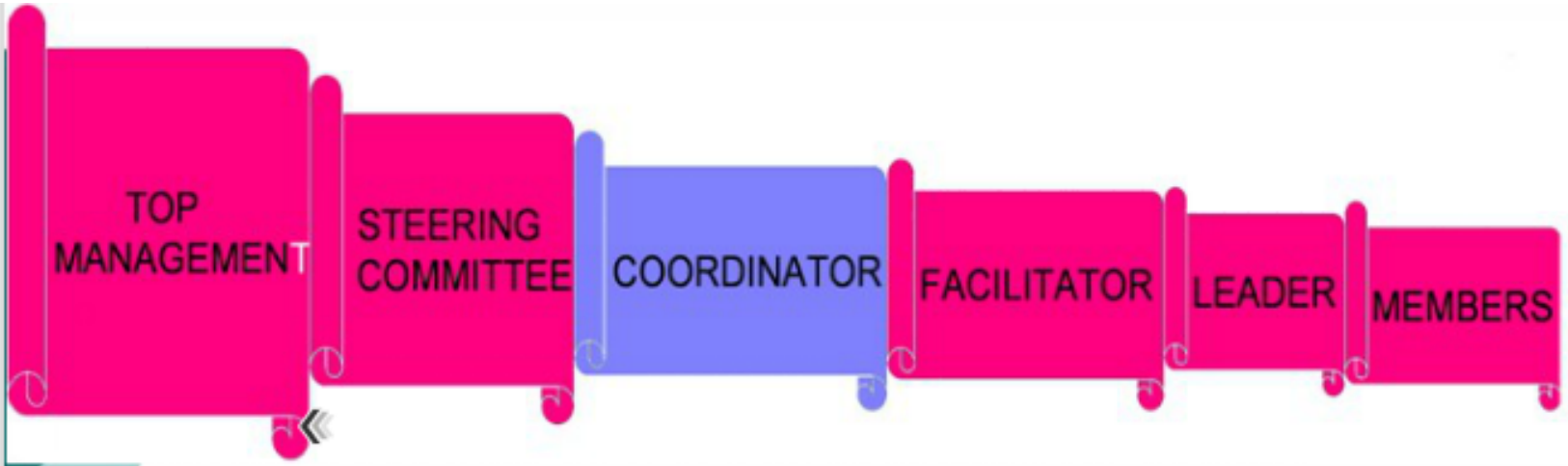
ROLES & RESPONSIBILITIES



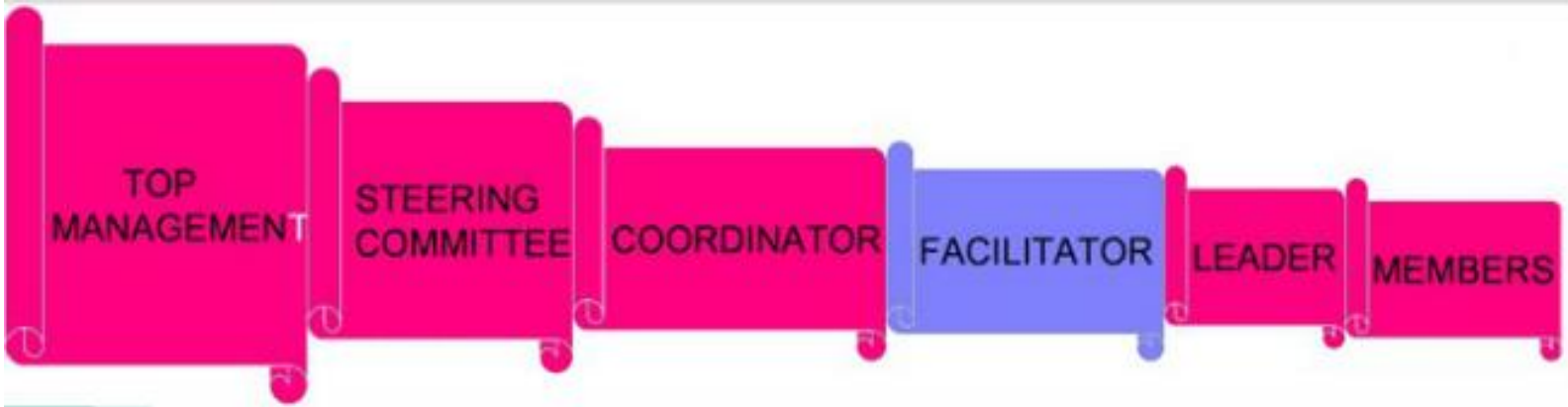
- **The Success of the quality circle depends solely on the attitude of the top management and plays an important role to ensure the success of implementation of quality circles in the organization.**



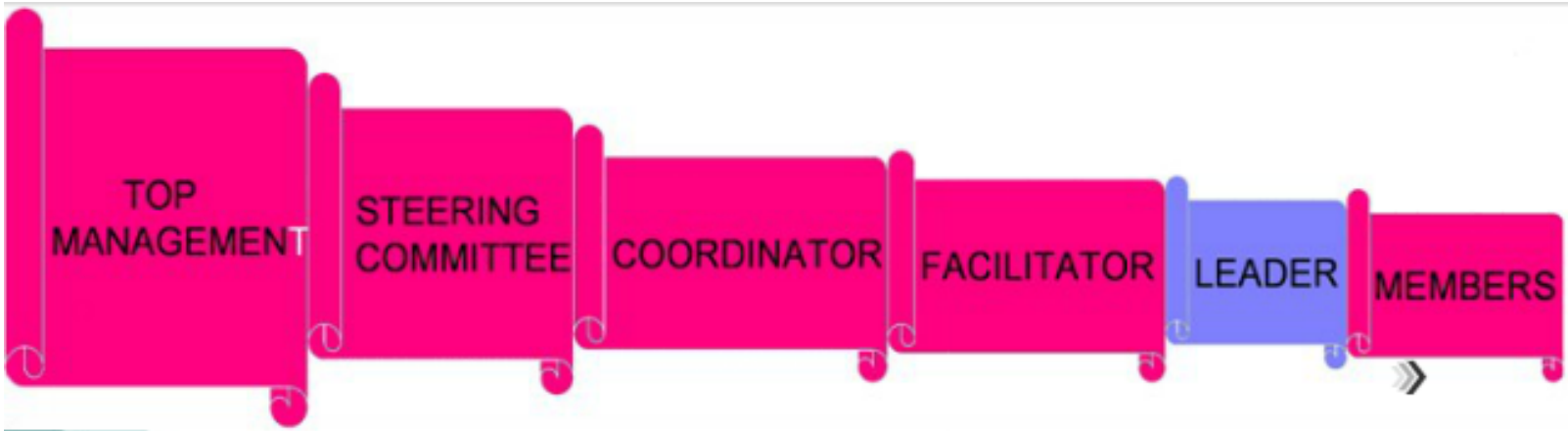
- **Steering committee called middle management consists of chief executive heads of different divisions or a coordinator plays a positive role in quality circle's activities for the success of the efforts.**
- **The meetings are conveyed at least once in one or two months interval.**



- **Coordinator, who also acts as a facilitator, is an individual responsible for coordinating and directing the quality circles activities within an organization and carries out such functions as would make the operations of quality circles smooth, effective and self-sustainable.**



- **Facilitator acts as a catalyst, innovator, promoter and teacher and is nominated by the management.**
- **Communicating with all levels of management and obtaining their support.**
- **Facilitating the training of leaders and members.**
- **Ensure objectivity in the activities.**
- **As a mediator in problem solving.**
- **Evaluating the cost and benefits.**



- **The leader is chosen by the members.**
- **Training members on problem solving techniques.**
- **Fostering the spirit of cooperation amongst the members.**
- **Assisting in recordkeeping.**
- **Conducting meeting in an orderly and effective manner.**
- **Enforcing team discipline.**
- **Channelizing the efforts effectively.**

- **Members provide suggestions.**

- **Members are expected to:**

  -Attend meetings regularly.
  -Direct their efforts towards solving work-related problems.
  -Identifying problems, contributing ideas, undertaking research and investigating.
  -Participating in management presentations.

Role of Quality Circle Member

1. Keep focus at all the times on organizational problems/objectives related to the work.
2. Not press for inclusion of personal problems.
3. Demonstrate mutual respect.
4. Offer views, opinions and ideas freely and voluntarily in problem solving.
5. Attempt all meeting except when unavoidable.
6. Contribute to finding solutions to problems.
7. Contribute to implementing solutions.
8. Attend training seriously with a receptive attitude.
9. Acquire skills to contribute to the problem solving activities of the circle.

Role of Quality Circle Leader

1. Conduct meeting and ensure participation by all members.
2. Help in collecting data related to problems.
3. Transmit QC suggestions to facilitator.
4. Interact among themselves and facilitator beside their own group members.
5. Present solutions/suggestions to management.
6. Maintain relevant records of meetings.
7. Ensure implementation of solutions by the group.
8. Keeping the circles informed about status of previously submitted suggestions.
9. Keeping the meeting positive and on track.
10. Training circle members in group process and in the use of tools and techniques for generating ideas and problem solutions.

Role of Facilitator

1. Co-ordinate the work of several QC's through leaders.
2. Serve as a resource to the group/circle.
3. Arrange for expertise from other groups/agencies.
4. Keep the circles on track and enthusiastic.
5. Acquire skills through training programmes.
6. Transfer skills to members of QC's.
7. Transmit proposals/solutions to management.
8. Arrange for training of QC members.
9. Provide feed back to members.
10. Provide feedback to management.
11. Maintain budgets and keep cost records.
12. Help circles to provide presentation to management.

The Facilitator should have the following qualities

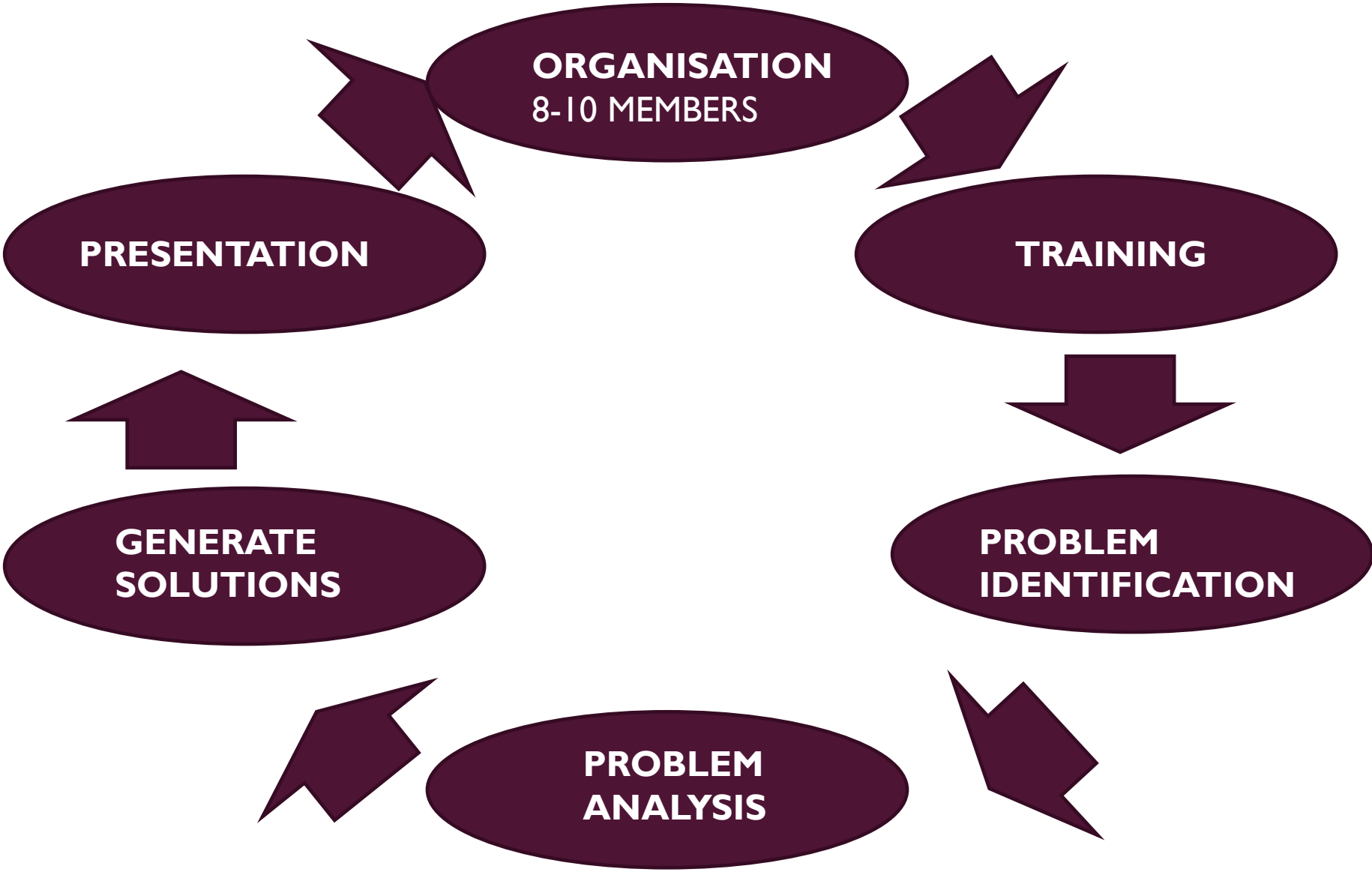
1. He must be able to train QC leaders and members in QC techniques.
2. He must have leadership qualities and organizational abilities in participative management.
3. He must have skills to motivate people maintain enthusiasm and keep QC's on track.
4. He must be able to express his ideas and QC philosophy both written and verbal.
5. He must be able to plan, organise and conduct meeting and make presentation to management.
6. He must have ability to contact and gain support from all levels of management.

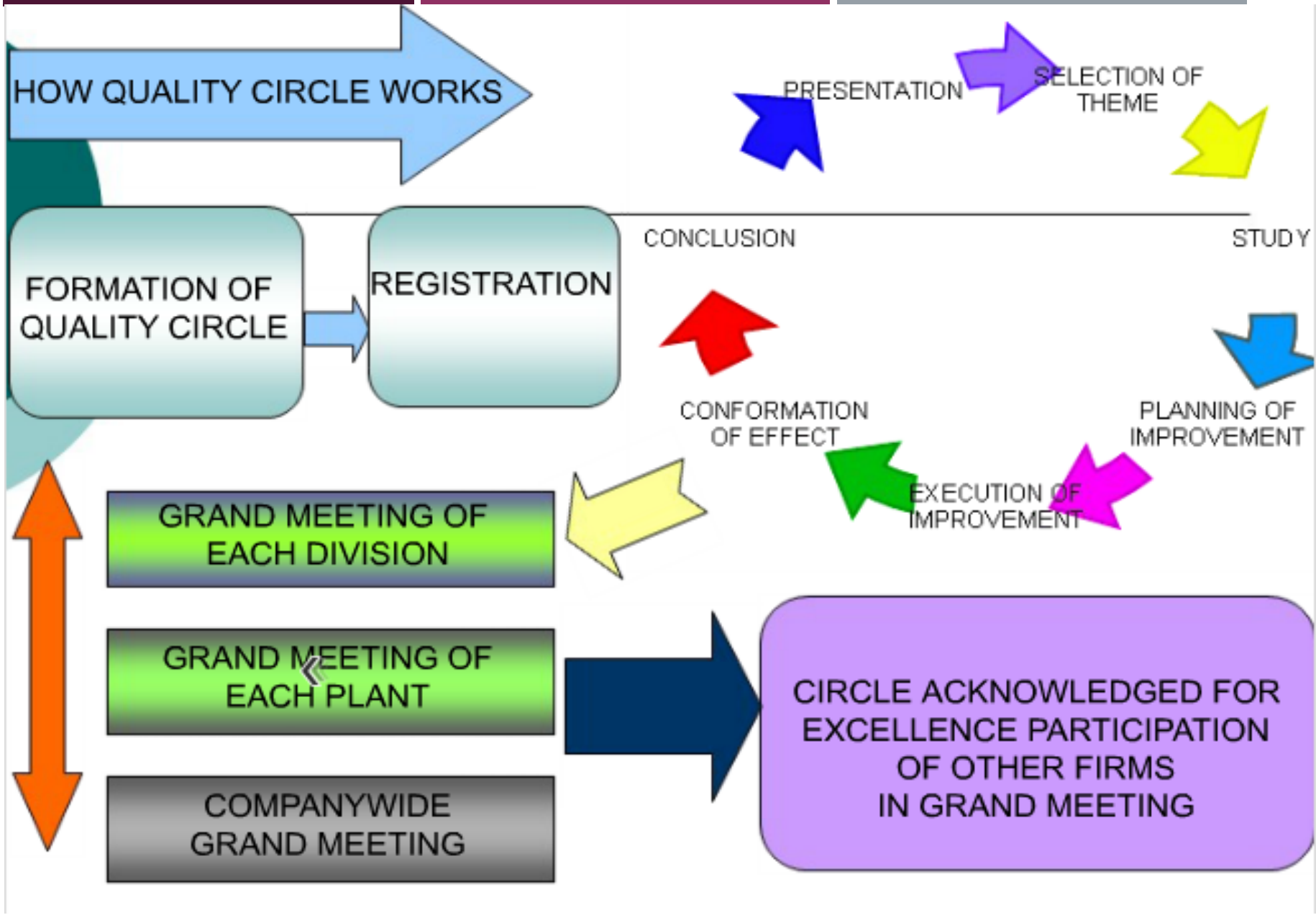
- The basic purpose of QC is to identify and solve work related problems .The circle members meet once a week.

- In early meetings , time is devoted mainly to train the circle members.

- Once they have acquired the fundamental skills for problem solving and mastered the quality analysis techniques they start working on problems.

- During the quality control circle process, each problem passes through various stages of operational cycle.


ORGANISATION
8-10 MEMBERS
TRAINING
PROBLEM IDENTIFICATION
PROBLEM ANALYSIS
GENERATE SOLUTIONS
PRESENTATION


HOW QUALITY CIRCLE WORKS
PRESENTATION
SELECTION OF THEME
CONCLUSION
STUDY
FORMATION OF QUALITY CIRCLE
REGISTRATION
CONFORMATION OF EFFECT
PLANNING OF IMPROVEMENT
EXECUTION OF IMPROVEMENT
GRAND MEETING OF EACH DIVISION
GRAND MEETING OF EACH PLANT
COMPANYWIDE GRAND MEETING
CIRCLE ACKNOWLEDGED FOR EXCELLENCE PARTICIPATION OF OTHER FIRMS IN GRAND MEETING

STEPS FOR ESTABLISHINGS QCC

- The management is made aware of the QCC process through briefing.
- The feasibility of QCCs is analysed.
- A steering committee is formed.
- A coordinator and in-house instructor are selected.
- QCC presentations are made first to line supervisors in identified areas, divisions or departments.
- Coordinators and middle management receive extensive training on the process and their roles.
- Supervisors who are interested volunteer and receive training.
- Following training, QCC presentations are made to the employees who report to the newly trained supervisor.
- A circle is formed and begins work.
- Circle usually consists of 6-8 members.

- Circle members should meet, ideally, once a week on a regular basis.
- In the first meeting the members select a name for their circle and elect a leader to conduct deliberations of their meetings.
- The members of the circle fix a day, time and venue for their weekly meeting.
- Circles work systematically in solving problems and not just discussing them.
- Management must ensure that solutions are implemented quickly once they have been accepted.
- Management recognizes appropriate and proper recognition for the solutions.

BENEFITS

- Raises Organizational morale
- Inspires more effective team work
- Promotes Job involvement
- Creates problem solving capabilities
- Promotes personal and leadership development
- Improves communication within the organization
- Promotes cost function
- Increases employee motivation

LIMITATIONS

1) Unrealistic expectations
2) Lack of Management- commitment &support.
3) Resistance by middle management.
4) Resistance by Non- participants.
5) Lack of clear objectives.
6) Failure to implement the remedial measures.
7) Lack of Desired co-ordination.
8) Lack of financial Assistance.
9) Different activities of members of quality circle

SUGGESTION SYSTEM

- Employee suggestion system are designed to encourage active cooperation of employees in the activities of business and industry through seeking ideas of **cost reduction** or **cost prevention** or **increasing productivity**

- It facilitates upward flow of communication.

- QCCs that have completed their project submits their suggestions to a committee, which reviews and grade them and at time reward good suggestions with cash payment.

- Each suggestion, once implemented, leads to revised standards.

BENEFITS OF SUGGESTION SYSTEM

- Improves employer-employee relationships
- Is an employee benefit scheme.
- Tends to increase the moral of the workforce.
- Acts as a good means of communication.
- Commits the workforce to take active interest in their work and company.
- Provides management with an organized way of handling their ideas.
- Constitutes an important tool of management “to feel the pulse” of the rank file.

STANDARDS FOR SUGGESTION SCHEME

- The suggestion scheme should have the wholehearted support of the top management.
- The rules and the processing operation of suggestions must be clearly explained to the employees. Sometimes the employees are informed about the kind of problems faced by the company so that the suggestions are given keeping these issues in mind.
- All suggestions should be promptly acknowledged and evaluated. If a suggestion is rejected, a proper explanation must be given for the act.
- Awards for acceptable suggestions should be monetary and on the liberal side, usually 15-30% of the first year's net savings.
- The award winners must be given widespread publicity through in house journals.

PROCEDURE FOR INTRODUCING SUGGESTION

Introduction: It is necessary for management to formulate the following principal:

- The employees are intelligent enough to think constructively about their job
- There is always a room for improvement in the company operations
- The management can gain from the ideas of employee
- The employees can contribute more than just a day's work

Processing suggestions: The suggestions are processed either by management alone or by a suggestion committee.

Receiving suggestions: The suggestions are received through

- Suggestion box
- Attitude survey
- Exit interviews
- Quality circles
- Others

Implementing suggestions: The most important thing that the management looks for in a suggestion is whether it will improve the operations of the firm in any sphere.

POKA-YOKE

- It is a famous production philosophy.
- **'Poka'** means mistake or inadvertent errors, while **'Yoke'** meaning proofing. So 'Poka-Yoke' means 'Mistake-proofing'.
- It was designed as a tool to achieve and sustain 'Zero-defect'.
- It is simple way to prevent occurrence of defects, injuries or losses of any kind at the workplace.
- It makes use sensors and instruments and devices that can identify disorders and abnormalities.
- Poka-yoke helps people and processes work right the first time.
- Poka-yoke does not need to be costly. For instance, Toyota has an average of 12 mistake proofing devices at each work station and a goal of implementing each device for under USD 150.

POKA-YOKE WORKS ON FIVE PILLARS (SUGGESTED BY SHINGO) :

- Use source inspection. The application of control function at the stages where errors, mistakes may get converted in defects or accidents. That is, use control/warning function at the origin of the defect.
- Always use 100% source inspection. It is better than sampling inspection.
- Minimize the time to carryout corrective actions.
- Set-up mistake proofing devices (called poka-yokes), i.e., sensors and transducers according to products and process requirements.
- Respect workers and operators.

STEP BY STEP PROCESS IN APPLYING POKA-YOKE

- Identify the operation or process - based on a Pareto analysis.
- Analyze the 5-whys and understand the ways a process can fail.
- Decide the right poka-yoke approach, such as using a shut out type (preventing an error being made), or an attention type (highlighting that an error has been made) .
- A poka-yoke can be electrical, mechanical, procedural, visual, human or any other form that prevents incorrect execution of a process step.
- Use of a checklist to ensure that all process steps have been completed appropriately.
- Try the method and see if it works.
- Train the operator, review performance and measure success.

Poka-Yoke device

- Poka-Yoke is a simple device or method to prevent mistake at their source.
- Some of the examples of Poka-Yoke devices are:

  - A large steel press is automatically monitored for wear. If the thickness becomes less than a specified amount, an alarm sounds and action has to be taken.
  - Packaging screws in groups of three to ensure that the assembler uses three screws.
  - A simple electrical check is made to verify that nuts are properly welded.
  - An airplane pilot may use a simple checklist to make sure everything is ready before flying his airplane.

Quality of Work Life:

- Defined as "Quality of relationship between employees and the total working environment"
- A process by which an organization responds to employee needs.
- QWL approach considers people as an "asset" to the organization rather than "costs"
- This approach motivates people by satisfying not only their economic needs but also their social and psychological needs.
- Today's workforce is realizing the importance of relationships and is trying to strike a balance between career and personal lives.
- Various programmes such as flexi time, alternative work schedules, compressed work weeks, telecommuting are being adopted by these organization.

Factors Influencing and Deciding the QWL

- **Attitude:** The person who is entrusted with a particular job needs to have sufficient knowledge, required skill and expertise, enough experience, enthusiasm, energy level, willingness to learn new things.

- **Environment:** The job may involve dealing with customers who have varied tolerance level, preferences, behavioral pattern, level of understanding.

- **Opportunities:** Some jobs offer opportunities for learning, research, discovery, self-development, enhancement of skills, room for innovation, public recognition, exploration, celebrity-status and loads and loads of fame.

- **Nature of Job**: For example, a driller in the oil drilling unit, a diver, a fire-fighter, traffic policeman, train engine driver, construction laborers, welder, miner, lathe mechanic have to do dangerous jobs and have to be more alert.

- **People:** Some professions need interaction with people like patients, media persons, public, customers, politicians, public figures and celebrities. These situations demand high level of prudence, cool temper, tactfulness, humor, kindness, diplomacy and sensitiveness.

- **Challenges:** The job should offer some challenges at least to make it interesting; That enables an employee to upgrade his knowledge and skill and capabilities.

- **Growth and Development**: If an organization does not give chance for growth and personal development it is very difficult to retain the talented personnel and also to find new talent with experience and skill.

- **Stress Level**: All these above mentioned factors are inter-related and inter-dependant.

- **Career Prospects**: Every job should offer career development. That is an important factor which decides the quality of work life.