Unit – 2
Total Quality philosophies and Principles

Contributions of Deming

W. Edwards Deming was a renowned American engineer, statistician, and management consultant who made significant contributions to the field of quality management. His work had a profound impact on the development of modern quality management practices. Here are some of his key contributions:

The Deming Philosophy

Deming's philosophy emphasized the importance of understanding and improving processes, rather than simply inspecting and correcting defects. He advocated for a holistic approach to quality management, involving all stakeholders and focusing on continuous improvement.

DEMING’s 14 Point Philosophy

Deming's 14 Points for Management are a set of guiding principles for organizations seeking to improve quality and productivity. These points emphasize the importance of:

1. Create and publish the aims and purposes of the organization

2. Adopting the new philosophy

3. Understand the purpose of inspection

4. Ending the practice of awarding business on the basis of price tag

5. Improving constantly

6. Instituting training

7. Instituting and teaching leadership

8. Driving out fear, create trust and create a climate for innovation

9. Breaking down barriers that rob people of workmanship

10. Optimize the efforts of teams, groups and staff areas

11. Eliminate exhortations for the work force

12. Eliminate MBO

13. Instituting a vigorous program of education and self-improvement

14. Putting everybody in the company to work to accomplish the transformation

THE DEMING'S PHILOSOPHY

Dr. W. Edward-Deming was a protege of Dr. Walter Shewhart, who pioneered statistical process control (SPC) at Bell Laboratories. He Spent one year studying under Sir Ronald Fisher, who pioneered design of experiments.

Dr. Deming is credited with providing the foundations of the Japanese quality miracle and resurgence as an economic power. He developed the following 14 points as a theory for management for improvement of quality, productivity and competitive position.

1. Create and publish the Aims and Purposes of the Organization

Management must demonstrate constantly their commitments to this statement. It must include investors, customers, suppliers, employees, the community and a quality philosophy. Organization must develop a long-term view of at least 10 years and plan to stay in business by setting long-range goals. Resources must be allocated for research, training and continuing education to achieve the goals. A family organizational philosophy is developed to send the message that every one is part of the organization.

2. Learn the New Philosophy

Top management and every one must learn the new philosophy. Organizations must seek never ending improvement and refuse to accept non conformance customer satisfaction is the number one priority, because dissatisfied customers will not continue to purchase non confirming products and service. Everyone in the organization, including the union, must be involved in the quality journey and change his or her attitude about quality.

3. Understand the Purpose of Inspection

Management must understand that the purpose of inspection is to improve the process and reduce it's cost. Statistical evidence is required of self and supplier every effort should be made to reduce and then eliminate acceptance sampling.

4. Stop Awarding Business based on Price Alone

The organization must stop awarding business based on the low bid, because price has no-meaning without quality. The goal is to have single suppliers for each item to develop a long-term relationship of loyalty and trust thereby providing improved products and service.

5. Improve Constantly and forever the System

Management must take more responsibility for problems by actively finding and correcting. Problems so that quality and productivity are continually and permanently improved and costs are reduced. The focus is on preventing problems before they happen variation is expected but these must be a continual striving for its reduction using control charts.

6. Institute Training

Each employee must be oriented to the organization philosophy of commitment to never-ending improvements management must allocate resources to train employees to perform their jobs in the best manner possible.

7. Teach and Institute Leadership

Improving supervision is management's responsibility. They must provide supervision with training in statistical methods and these 14 points so the new philosophy can be implemented, instead of focusing on a negative. Fault-finding atmosphere, supervisors should create a positive, supportive one where pride in workmanship can flourish.

8. Drive out fear, Create Trust, and Create a Climate for Innovation

Management must encourage open, effective communication and teamwork. Fear is caused by a general feeling of being powerless to control important aspects of one's life. It is caused by a lack of Job security, possible physical harm, performance appraisals, ignorance of organization goals, poor supervision and not knowing the job. Driving fear out of the work place involves managing for success. When people are treated with density, fear can be eliminated and people will work for the general good of the organization. In this climate, they will provide ideas for improvement.

9. Optimize the Efforts of Teams, Groups and Staff Areas

Management must optmize the efforts of teams, work groups and staff areas to achieve the aims and purposes of the organization. Barriers exist internally among levels of management, among departments, within departments and among shifts. To break down the barriers, management will need a long-term perspective. All the different areas must work together. Attitudes need to be changed ; communication channels opened project teams organized and training in team work implemented.

10. Eliminate Exhortations for the Work Forces

Exhortations that ask for increased productivity without providing specific improvement methods can handicap an organizations. They do nothing but express managements desires. They do not produce a better product or service, because the workers are limited by the system.

11. (*a*) **Eliminate Numerical Quotas for the Work Force**

Instead of quotas, management must learn and Institute methods for improvement. Quotas and work standards focus on quantity rather than quality. They encourage poor workman ship in order to meet their Quotas. Quotas should be replaced with statistical methods of process control.

11. (*b*) **Eliminate Management by Objective**

Instead of management by objective, management must learn the capabilities of the process and how to improve them. Internal goals set by management, without a method are a burlesque.

12. Remove Barriers that Rob People of Pride of Workmanship

Loss of pride in workmanship exists throughout organizations because

(1) Workers do not know how to relate to the organizations mission.

(2) They are being blamed for system problems.

(3) Poor designing leads to the production of ''Junk''.

(4) Inadequate training is provided.

(5) Punitive supervision exists.

(6) Inadequate or ineffective equipment is provided for performing the required work.

Restoring pride will require a long term commitment by management. When workers are proud of their work, they will grow to the fullest of their job. By restoring pride, everyone
in the organization will be working for the common good. A barrier for people on salary is
the annual rating of performance.

13. Encourage Education and Self-improvement for Everyone

What an organization needs is people who are improving with education. A long-term commitment to continuously train and educate people must be made by management Deming's 14 points and the organization's mission should be the foundation of the education program.

14. Take Action to Accomplish the Transformation

Management has to accept the primary responsibility for the never-ending improvement of the process, it has to create a corporate structure to implement the philosophy. A cultural change is required from the previous ''business as usual'' attitude. Management must be committed, involved and accessible if the organization is to succeed in implementing the new philosophy.

The PDCA Cycle

Deming popularized the Plan-Do-Check-Act (PDCA) cycle, a methodology for continuous improvement. This cycle involves:

1. Planning: Identifying opportunities for improvement

2. Doing: Implementing changes

3. Checking: Evaluating results

4. Acting: Refining and standardizing improvements

Contributions of Juran

Joseph M. Juran was a Romanian-American engineer and management consultant who made significant contributions to the field of quality management. Here are some of his key contributions:

The Juran Trilogy

Juran's trilogy consists of three main components:

1. Quality planning: Identifying customers, determining their needs, and developing products to meet those needs.

2. Quality control: Monitoring and controlling processes to ensure conformance to requirements.

3. Quality improvement: Continuously improving processes and products to achieve higher levels of quality.

Quality by Design

Juran emphasized the importance of designing quality into products and processes from the outset, rather than relying on inspection and testing to detect defects.

The Pareto Principle

Juran popularized the Pareto principle, which states that a small proportion of causes (typically 20%) are responsible for a large proportion of effects (typically 80%). This principle is often used to identify and prioritize areas for improvement.

The Cost of Poor Quality

Juran highlighted the economic importance of quality, emphasizing that the cost of poor quality can be substantial. He encouraged organizations to measure and track the cost of poor quality to justify investments in quality improvement.

The Role of Leadership

Juran stressed the importance of leadership in driving quality improvement. He believed that leaders should set clear goals, provide resources, and encourage a culture of continuous improvement.

Contributions of Crosby

Philip B. Crosby was an American businessman and author who made significant contributions to the field of quality management. Here are some of his key contributions:

Zero Defects

Crosby popularized the concept of "Zero Defects," which emphasizes the importance of striving for perfection in all aspects of an organization's operations.

The Four Absolutes of Quality Management

Crosby identified four absolutes of quality management:

1. Quality is conformance to requirements: Quality is defined as meeting customer requirements and expectations.

2. The system for causing quality is prevention: Prevention is the best way to ensure quality, rather than inspection and detection.

3. The performance standard must be zero defects: Organizations should strive for zero defects, rather than accepting a certain level of defects as inevitable.

4. The measurement of quality is the price of nonconformance: The cost of nonconformance (e.g., rework, scrap, warranty claims) is a key measure of quality performance.

Contributions of Masaaki Imai

Masaaki Imai is a Japanese management consultant and author who made significant contributions to the field of quality management and continuous improvement. Here are some of his key contributions:

Contributions

1. Kaizen Philosophy: Imai popularized the concept of Kaizen, a Japanese philosophy that emphasizes continuous improvement and incremental change.

2. Gemba Kaizen: Imai introduced the concept of Gemba Kaizen, which focuses on improving processes and workflows at the workplace (gemba) rather than in a conference room.

3. Total Productive Maintenance (TPM): Imai helped to develop and promote TPM, a holistic approach to maintenance that aims to maximize equipment effectiveness and reduce downtime.

4. Quality Circles: Imai supported the development and implementation of quality circles, small groups of employees who work together to identify and solve quality-related problems.

5. Continuous Improvement Culture: Imai emphasized the importance of creating a culture of continuous improvement within organizations, where employees are empowered to identify and solve problems.

Contributions of Feigenbaum

Armand V. Feigenbaum was an American quality control expert and management consultant who made significant contributions to the field of quality management. Here are some of his key contributions:

Key Contributions

1. Total Quality Control: Feigenbaum introduced the concept of Total Quality Control (TQC), which emphasizes the importance of integrating quality control into all aspects of an organization.

2. Quality as a Business Strategy: Feigenbaum advocated for quality as a key business strategy, rather than just a technical activity.

3. The Three Steps of Quality: Feigenbaum identified three steps to achieving quality: (1) quality awareness, (2) quality improvement, and (3) quality control.

4. The Hidden Factory: Feigenbaum coined the term "hidden factory" to describe the costs associated with rework, scrap, and other quality-related problems.

Contributions of Ishikawa

Kaoru Ishikawa was a Japanese organizational theorist and consultant who made significant contributions to the field of quality management. Here are some of his key contributions:

Key Contributions

1. Fishbone Diagram (Ishikawa Diagram): Ishikawa developed the fishbone diagram, a tool used to identify and organize the possible causes of a problem.

2. Total Quality Control (TQC): Ishikawa was a key proponent of TQC, which emphasizes the importance of integrating quality control into all aspects of an organization.

3. Quality Circles: Ishikawa supported the development and implementation of quality circles, small groups of employees who work together to identify and solve quality-related problems.

4. Seven Basic Tools of Quality: Ishikawa identified the seven basic tools of quality, which include:

1. Fishbone diagram 2. Histogram 3. Pareto chart 4. Check sheet 5. Control chart 6. Scatter diagram 7. Stratification.

Continuous improvement

Continuous improvement, also known as Kaizen, is a philosophy and methodology that aims to improve processes, products, and services continuously. Here are some key aspects of Kaizen:

Key Principles of Kaizen

1. Continuous improvement: Encourage ongoing improvement in all aspects of the organization.

2. Employee empowerment: Empower employees to identify and solve problems.

3. Collaboration: Foster a culture of collaboration and teamwork.

4. Scientific approach: Use data and scientific methods to analyze and improve processes.

5. Focus on process: Focus on improving processes, rather than just fixing problems.

Kaizen Methodology

1. Identify opportunities: Identify areas for improvement.

2. Analyze the problem: Analyze the problem using data and scientific methods.

3. Develop solutions: Develop potential solutions.

4. Implement solutions: Implement the chosen solution.

5. Evaluate results: Evaluate the results of the improvement.

6. Standardize: Standardize the improved process.

Kaizen Tools and Techniques

1. PDCA (Plan-Do-Check-Act) cycle: A framework for continuous improvement.

2. Root cause analysis: A method to identify the underlying cause of a problem.

3. Fishbone diagram: A tool to identify and organize the possible causes of a problem.

4. Pareto chart: A tool to identify the most common problems.

5. Kaizen events: Workshops or meetings focused on improving a specific process or problem.

Benefits of Kaizen

1. Improved quality: Continuous improvement leads to higher quality products and services.

2. Increased efficiency: Improved processes reduce waste and increase productivity.

3. Cost savings: Reduced waste and improved efficiency lead to cost savings.

4. Employee engagement: Empowered employees are more engaged and motivated.

5. Competitive advantage: Organizations that adopt Kaizen are more competitive and adaptable.

Concepts of Quality Circle

Quality Circles (QCs) are a popular approach to quality management that originated in Japan in the 1960s. Here are the key concepts of Quality Circles:

Definition and Purpose

1. Definition: A Quality Circle is a small group of employees who meet regularly to identify, analyze, and solve quality-related problems.

2. Purpose: The primary purpose of a Quality Circle is to improve quality, productivity, and employee engagement by empowering employees to take ownership of quality-related issues.

Key Elements

1. Voluntary Participation: Employees participate voluntarily in Quality Circles.

2. Small Group Size: Typically 5-15 members.

3. Regular Meetings: Meetings are held regularly, usually once a week.

4. Trained Facilitator: A trained facilitator leads the Quality Circle.

5. Problem-Solving Methodology: A structured problem-solving approach is used.

Quality Circle Process

1. Identify Problems: Identify quality-related problems or opportunities for improvement.

2. Analyze Problems: Analyze the problems using tools like fishbone diagrams, Pareto charts, and histograms.

3. Develop Solutions: Develop potential solutions to the problems.

4. Implement Solutions: Implement the chosen solutions.

5. Evaluate Results: Evaluate the results of the implemented solutions.

Benefits

1. Improved Quality: Quality Circles help improve product or service quality.

2. Increased Employee Engagement: Employees are empowered to take ownership of quality-related issues.

3. Improved Productivity: Quality Circles help reduce waste, defects, and rework.

4. Cost Savings: Quality Circles help reduce costs associated with quality-related problems.

Challenges and Limitations

1. Management Support: Quality Circles require management support and commitment.

2. Training and Development: Employees require training and development to participate effectively in Quality Circles.

3. Sustaining Momentum: Quality Circles can lose momentum over time if not sustained.

4. Measuring Success: Measuring the success of Quality Circles can be challenging.

Japanese 5S principles

The Japanese 5S principles are a methodology for organizing, standardizing, and sustaining a productive and efficient work environment. Here are the 5S principles:

The 5S Principles

1. Seiri (Sort): Separate essential items from non-essential items and remove unnecessary items from the workplace.

2. Seiton (Set in Order): Organize essential items in a logical and efficient manner, making it easy to access and use them.

3. Seiso (Shine): Clean and sanitize the workplace to create a safe and healthy environment.

4. Seiketsu (Standardize): Establish standards and procedures for maintaining the workplace and ensuring that everything is in its proper place.

5. Shitsuke (Sustain): Make 5S a habit by incorporating it into daily routines and continually evaluating and improving the workplace.

Benefits of 5S

1. Improved Efficiency: 5S helps to reduce waste, improve workflow, and increase productivity.

2. Enhanced Safety: 5S promotes a clean and organized workplace, reducing the risk of accidents and injuries.

3. Better Quality: 5S helps to reduce defects and errors by ensuring that everything is in its proper place.

4. Increased Morale: 5S promotes a sense of pride and ownership among employees, leading to increased morale and motivation.

Implementation of 5S

1. Training and Awareness: Provide training and awareness programs to educate employees about the 5S principles.

2. 5S Teams: Establish 5S teams to lead the implementation and sustainment of 5S.

3. 5S Audits: Conduct regular 5S audits to evaluate the effectiveness of 5S and identify areas for improvement.

4. Continuous Improvement: Encourage continuous improvement by empowering employees to identify and solve problems.

8D Methodology

The 8D methodology is a problem-solving approach used to identify and resolve problems. The 8D methodology consists of the following steps:

Step 1: D0 - Prepare

Prepare for the problem-solving process by gathering data and information.

Step 2: D1 - Define

Define the problem and identify the key issues.

Step 3: D2 - Describe

Describe the problem in detail, including its impact and consequences.

Step 4: D3 - Develop

Develop a plan to address the problem and identify potential solutions.

Step 5: D4 - Discover

Discover the root cause of the problem using tools

Step 6: D5 - Design

Design a solution to address the root cause of the problem.

Step 7: D6 - Develop and Implement

Develop and implement the solution, and verify its effectiveness.

Step 8: D7 - Evaluate and Refine

Evaluate the effectiveness of the solution and refine it as necessary.

Step 8D: D8 - Implement and Review

Implement the solution and review its effectiveness to ensure that the problem is fully resolved.

The 8D methodology is a structured approach to problem-solving that can be used in conjunction with the 5S principles to improve efficiency and effectiveness.