

Chapter 7: Continuous improvement

- Continuous improvement is an inherent part of the TQM process.
- Continuous improvement consists of measuring key quality and other process indices in all areas and taking actions to improve them.
- These indices could include the output of a manufacturing process, customer satisfaction, the errors in engineering drawings, warranty returns, or any of number of other measures to characterize a process.
- The continuous improvement concept focuses on:
 1. Finding shortfalls and sources of variability in administrative processes, manufacturing processes, and service processes, that can detract from a quality output
 2. And improving the process to eliminate undesirable outputs.
- “Continuous” refers to actions, which are uninterrupted, whereas “continual” actions need not be uninterrupted.
- Total Quality Management is insisting on this continual improvement again and again and so it is necessary to explain this way of working.
- Reasons for Continual Improvement: External:
 1. Continuously increasing customer expectations
 2. Increased demands on reducing costs
 3. Increased competition to products in domestic and international market
 4. Customer satisfaction is must in any case
- Reasons for Continual Improvement: internal:
 1. Attitudinal change required
 2. Removal of mental blocks
 3. Understanding that “ Nobody is perfect”
 4. Involving all employees is a must
 5. There is nothing that cannot be improved further
 6. Improvements in small steps
- One of the approaches to achieve continual improvement is to reduce **waste**.

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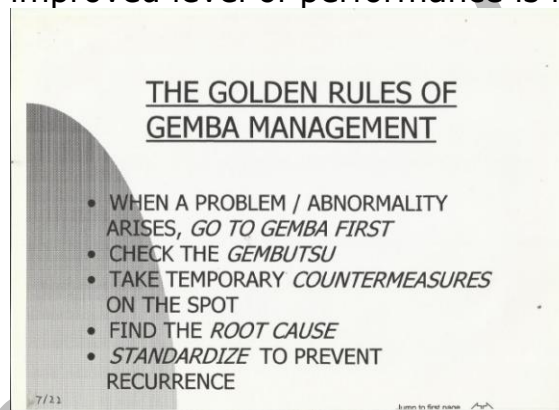
1. Waste is anything, which does not add value to a product or service.
2. Customer is not ready to pay for waste.
3. Value adding is that part of the work for which the customer is ready to pay.
4. Total wastes (MUDA) in an Organization:
 - Intermediate storage
 - Idle machine
 - Too much of paperwork
 - Scrap and repair
 - Search tools and gauges
 - Lengthy procedures
 - Transport over long distance
 - Zigzag production layout: too much back tracking
 - Excess manpower
 - Too much inventory
- **Ten rules** for continuous improvement:
 1. Take a new standpoint for hitherto procedure
 2. Think how something can be made
 3. Do not ask why something cannot be made
 4. Question everything
 5. A 50% solution is better than 100% solution that can hardly be achieved
 6. Correct mistakes immediately
 7. Spend less money for improvements
 8. The capability to solve problems is developed through problems themselves
 9. Ask “why” 5 times and find the true reasons
 10. Ten people solve a problem better than an individual specialistContinuous improvement has no end.
- **Twenty keys to workplace improvement**
 1. Cleaning and Organizing: Five “S”:
 2. Rationalizing the system / Management of objectives
 3. Small group activities

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4. Reduce work in process WIP:
 5. Quick changeover technology:
 6. Value analysis (Kaizen in operations):
 7. Zero Monitor Manufacturing
 8. Lean manufacturing
 9. Maintaining machines and equipments
 10. Work floor time policies
 11. Quality Assurance System
 12. Developing your suppliers
 13. Eliminating waste
 14. Empowering workers to make improvements
 15. Training and retraining, Skill versatility and cross training:
Multi-skilled workforce
 16. Production scheduling and process control
 17. Efficiency control
 18. Using microprocessors
 19. Conserving energy and materials
 20. Leading technology
- **Gemba Kaizen**
 - Gemba means workplace, MUDA means waste and Kaizen means continuous improvement.
 - If we have to solve any problem and do any improvement, we have to go to Gemba first, that means, we have to leave our office and go to the workshop, to the machine, to the worker, and spend value time in that environment.
 - The first and foremost activity is look for all the MUDA i.e. wastes on the workplace Then we have to improve the housekeeping.
 - MUDA elimination in totality and quantum improvement in housekeeping as per 5S methodology is a must.
 - **PDCA Cycle:**
 - The essence of the reactive approach is standardization of the problem solving process using Deming's PDCA cycle and the seven QC steps under the PDCA cycle.
 - **SDCA Cycle:**

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- A refinement of the PDCA cycle aimed at stabilization of production processes prior to making attempts to improve.
- Plan Stage:
 - Select the theme or project
 - Collect and analyze data: Understand and highlight the problem.
 - Analyze causes: Find out the root cause of the problem.
- Do Stage:
 - Plan and implement solution: eliminate the root causes of the problem.
- Check Stage / Study stage:
 - Evaluate effects
 - Summarize what was learned
- Act stage:
 - Standardize solution: The objective of this step is that the improved level of performance is maintained



- Gembutsu means the three real things which are:
 - The actual place of work, shop floor or gemba (pronounced gem-baah)
 - The actual product or gembutsu (pronounced gem-boot-sue)
 - The real facts and data or jujitsu (pronounced jew-jeet-sue)
- **Quality Function Deployment**, or QFD, is a basic TQM tool, which is a graphical methodology that systematically develops and unearths customer's stated and unstated needs and expectations. It is also called as House of Quality. Once these needs and expectations are

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known, we can drive them into product development and manufacturing process development.

- QFD has several advantages. These include identifying customer needs and expectations, determining how to meet them, defining quantified goals, importance of each process in meeting customer requirements, and amount of attention to be given to each requirement. The benchmarking of our product or service with respect to those of competitors, as well as customer's perception of our product/service is also known. It is an amazing exercise which must be done by every entrepreneur.
- **Poka-yoke** is a Japanese term that means "mistake-proofing". A poka-yoke is any mechanism in a lean manufacturing process that helps an equipment operator avoid (yokeru) mistakes (poka). Its purpose is to eliminate product defects by preventing, correcting, or drawing attention to human errors as they occur.
 - The aim of poka-yoke is to design the process so that mistakes can be detected and corrected immediately, eliminating defects at the source. i.e.
 - To eliminate the possibility or opportunity for passing on errors or making mistakes in a process.

Remember 3 rules....

An error proofing system should take into consideration these 3 simple rules :



Ideally, design the product so that it *can't* be assembled incorrectly!!!

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- **Quality circles:** A quality circle is a volunteer group composed of workers (or even students), usually under the leadership of their supervisor (or an elected team leader), who are trained to identify, analyze and solve work-related problems and present their solutions to management in order to improve the performance of the organization, and motivate and enrich the work of employees. After getting matured, true quality circles become self-managing, having gained the confidence of management.
 - Quality circles were first established in Japan in 1962.
 - Kaoru Ishikawa has been credited with their creation.