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TECHNIQUES FOR OPERATIONS EFFICIENCY

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Abstract

For Techniques for Operations efficiency, First step is the controlling process by implementation of standards because comparison of standards are the criteria against which actual performance would be measured. Operational controls may be Manual or automated – in both the cases involve people, processes and technology. Steps for strategic control must be known at various levels in Organization with SOP (Standard operating procedure). A set of written instructions / checklist that describes the step – by – step process that must be implemented effectively to perform a routine activity. Well proven Management methods of Systematic problem Solving, Quality Circles , 5 S System, JIT , SMED ,Poka-yoke, Kaizen, Total Productive Maintenance, Communication Skills , Attitude trainings etc. makes the full proof system with assured outputs.

Bench Marking, Continuous Analysis, Research and developments, Cost effective measures make an organization as World Class manufacturing.

Learning outcome from this study will improve abilities in strategic planning, managing projects, improving efficiency with quality, teaching Technical & Management subjects, motivating a team towards cost control through proper utilization of Man , Machine and Material. Ability to identify areas of strength, implement given policies and bringing about relevant changes in system to deliver optimum quality product.

Introduction

Indian Industry was passing through turbulence times since 1990 , the emphasis was on quantity with little concern for Quality , delivery and cost.

1. Economic Condition: In many parts of world , especially in the post world war era- there was a focus on rebuilding and rapid Industrialization , meeting the demand of growing population availability of material in considerable quantity was aim rather than cost and quality.
2. Consumer Demand: Consumers need affordable products and there was a perception that lower prices were achievable by sacrificing quality. Most of the people were looking for basic functional items rather than luxury or high quality goods.
3. Technological Limitations: Manufacturing technology and quality control methods with cost effective e analysis were not as advanced as they are today. It was a challenge to maintain consistency in high quality with low cost or minimum inputs with maximum outputs.

4. Global Competition: In some industries particularly in manufacturing competition was driven by the need to produce large quantities to remain competitive on global scale. Main focus was on quantity to capture market share.
5. Regulatory Environment : That time consumer protection and uniform quality was second priority rather than achieving more and more production. Machines were not equipped with process parameter control system and there were lake in R & D concepts.

1995 onwards the environment has changed drastically because of entry of global players and the increase of competition . The manufacturing needs more concentration towards lead time reduction , continuous improvements, excellence in quality, cost competitiveness . After 1995 O & M (Operations and Maintenance) had given analytical approach , a crucial role in industrial settings – it can increase productivity , reduce downtime and improve safety , also concept of supply chain had been implemented with control over process waste at various stages.

The Organization , in order to sustain and grow in competitive market must continuously improve quality and reduce cost by finding high cost , inefficient operations, non value added activities and rework and rejection.

Systematic Problem Solving:

A Problem implies a gap in the planned and actual performance. Complaints by the internal or external customer and activities that cause late working , excessive consumption of resources.

Problems can be grouped under following Headings.

Decrease Problems: Solution of problems solving on magnitude rather than to eliminate entirely.

Increase Problems: Increase problems are those where in the objective to in crease sales , production etc.

Problems of Maintenance: These problems appear in processes which have run smoothly prior to the occurrence of a discrepancy.

Problems of Improvement: There are problems where the status quo considered unsatisfactory and needs to be taken to an improved level.

Zero Problems: Problems where the objective is to completely eliminate the problem. In fact this ideal condition doesn’t maintain for longer time.

7 QC TOOLS

Now we can define the problems and its elements. Let us know about the methods to solve it. 7 QC tools are very effective in solving the various problems.

1.Check sheets / Checklists / Tally sheets: simple tool to record data or information systematically. Data Collection and analysis give guideline , trend analysis to improve process.

2.Graphical Presentation: A graph is a pictorial representation of data which is easy to understand at a glass.

3.Histogram: A Histogram is a graphical representation of the distribution of data. It consists a series of bars where each bar represents a range of data values and the height of bar corresponds to the frequency or count of data points within that range. It easier to understand patterns and trend.

4.Ishikawa diagram: Prof of Tokyo University has developed this as Fishbone diagram (due to its shape)or “Cause and effect” diagram. Systematically analyzing of root causes the diagram takes the head of fish Skelton represents problem or irregularities and the bones branching out to represent various potential causes or factors contributing to the problem.

5. Pareto’s Analysis : It is technique of identifying vital causes by arranging the data according to the descending order of their frequency of occurrence. Criteria is based upon 80/20 rule which suggests that roughly 80% of effects come from 20% of causes.

6. Stratification: This is the technique of segregating or rearranging the data on the basis of certain characteristics for example Machine wise, Opertorwise, Supplierwise etc. for identifying the influencing factor and making the best proposals.

7. Scatter diagram: These are useful for exploring data, identifying trends and understanding relationship between variables in various fields like statics, science and business analysis. It correlates two variables on X and Y axis.

QUALITY CIRCLE

The Quality Circle is a very powerful tool for quality improvements. One key benefit is that it increases the team spirit across the organization as well as makes the task simple to achieve.

Group of employees meet regularly or scheduled time to undertake work related projects – quality, productivity, safety, efficiency, cost , working conditions etc. in big organization 8 to 10 members of QC give feedback to Steering Committee.

5 - S FOR GOOD WORKPLACE ORGANIZATION

5-S is a commonsense approach towards housekeeping , timely segregation , habits etc.

Sr. No.	Japanese	English	Meaning	How to Implement at Workplace ?
1	SEIRI	Structurise	Sorting	Classify items into the necessary and unnecessary – keep required and dispose others which are not needed.
2	SEITON	Systematize	Re - Organize	Store the things systematically to ensure safety , quality and condition. Storage method must permit an efficient use of space , long shelf life and easy retrivability of items with in targeted period.
3	SEISO	Sanitise	Clean Up	Maintain workplace free from dirt , dust

				and garbage.
4	SEIKETSU	Standardise	Standardisation	Maintain cleanliness and techniques as above.
5	SHITSUKE	Self - discipline	Sustain	Make a habit of doing things

SET UP TIME REDUCTION

Single Minute Exchange of Dies - SMED

It suggests that all die changes should be completed in a single digit number of minutes (such as 9 minutes , 5 minutes , 2 minutes).

Set up time is the time required to prepare a machine or a group of machines to change over from one job to another.

MUDA (WASTE) ELIMINATION

Muda is a Japanese term that means WASTE or FUTILITY.

There is seven types of Muda as follows:

S. No.	Type of MUDA	Description
1	Overproduction	Production more than what is needed.
2	Waiting	Wasted time when employees or equipment are idle.
3	Transportation	Unnecessary movement of materials or products.
4	Inappropriate Processing	Using more resources than necessary for a task.
5	Excess Inventory	Holding excessive inventory levels.
6	Unnecessary Motion	Unneeded Physical moment by employees
7	Defects	Producing products that require rework or correction .

POKA-YOKE (MISTAKE / ERROR PROOFING)

Poka – yoke is a Japanese term that means “Mistake proofing” or “Error prevention” .

Poka yoke methods involve creating safeguards, Checks or visual follow up to to make process nearly impossible for a mistake. This concept is often used in Quality control and process efficiency under Lean Manufacturing.

Poka-yoke may be designed either to help the operator to recognize the defect, before it occurs called “Prevention type poka – yoke ” or to help the operator to know immediately on occurrence of defect. This type of poka-yoke called as “Detection type of Poka-Yoke”.

STATISTICAL PROCESS CONTROL (SPC)

I. SPC helps Organizations to achieve Consistent product quality, reduce defects, minimize waste and increase efficiency. It is a crucial tool in Quality Management by implementing Control Charts , Central tendency, Variation, Control limits, Out of Control Signals, etc.

KAIZEN (FOR CONTINUOUS IMPROVEMENT)

Kaizen means making a great number of continuous improvements by discovering small problems and eliminating them permanently . Kaizen helps to organization in setting and reaching higher standard of performance.

Kaizen aims to create a c culture of learning and improving with in an organization. It can be implemented as three ways:

1. Management Kaizen
2. Group Kiazen
3. Individual Kaizen

TOTAL PRODUCTIVE MAINTENACE (TPM)

TPM IS KEEPING M ACHINES IN GOOD WORKING CONDITION.

The Systematic maintenance of equipments so that they fail less frequently and support targets in productivity.

JUST IN TIME (JIT)

This is the Management philosophy only what is needed , when it is needed. JIT focuses on producing goods only as they are required minimizing waste and inventory. JIT is key component of Lean Manufacturing.

PLAN-DO-CHECK-ACT (PDCA) / REARCH & DEVELOPMENT (R&D)

PDCA cycle is an endless improvement strategy for c correct operations at various stages.

It involves reviewing the daily performance of routine day to day activities in order to identify the gaps between planned and actual performance. Taking counter measures to reduce variations. To get more output by investing less inputs an analytical approach with research and Development.

BENCHMARKING

Benchmarking is the process of comparing the performance of a system, process , product against a set of standards or competitors. It help organizations identify area of improvements .

Benchmarking can be applied in various fields including technology , business and manufacturing.

- Understanding about Improved productivity , cost reduction , Quality Enhancement , Resource Optimization, Risk Management , Data analysis, Process Mapping, Supply Chain Management, Project Management, Adaptability.
- Gain conceptual knowledge on World Class Manufacturing by Systematic Problem Solving, 7 QC Tools, Quality Circle, 5-S for good workplace Organization, Set up time reduction (SMED), Muda (Waste) Elimination, Poka Yoke (Error Proofing), Statistical Process control, Kizen, TPM, JIT, PDCA, Bench Marking.
- Lean Management focus on targets, digital communication, Effective Communication and Tips for Interview.

Organizational hierarchy

Organizational hierarchy refers to the structure of authority and responsibility within an organization. It typically includes various levels of management and staff, with each level having a specific role and responsibilities. The hierarchy often looks like this:

1. Top – Level Management : This includes the President , Chief Operating Officer (CEO) or other high-ranking executives. They make strategic decisions to set overall direction of the organization.
2. Middle – Level Management : This layer includes various Managers in Marketing , Production , Finance, Human-resources etc. with specific responsibility.
3. Lower – Level Management : Supervisors and team leaders fall into this category with day to day responsibility. They have to report Middle level management.
4. Non-Management Staff : This is the bulk of workforce working on the directions of their Superiors. This category performs core function of the organization as per instructions of Supervisors.

The exact hierarchy can very depending on the Size of Organization. Small industry have fewer Management layers while others, especially large Corporations have more complex hierarchy.

Business Communication

Management work is a set of composite functions that includes communication, this is the basic skill for effective business.
This process is becoming more complex with business becoming global. Communication is a skill that everyone has but not everyone can use it skillfully.

Communication cannot be taught but it can be learnt.

To build effectiveness of communication care should be taken in developing the message, using appropriate medium, giving consideration to receiver and environment in which the delivery of message takes place.