

Quality & Productivity Improvement in Manufacturing Industries by PDCA, RCA and Kaizen Techniques

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ABSTRACT

Productivity and quality are intimately linked. An effective way to improve productivity is through quality control which must be a comprehensive effort carefully linked to the strategic planning process. This study examine the factors responsible for providing a major enhancement to the organization by improving its quality and hence productivity. Here below we will study a production line which is a Wiper link line & then will determine the losses or problems which are creating hindrance in the way of Productivity & Quality then each of the Problems will be studied & killed out simultaneously.

I. INTRODUCTION

Worldwide competition and the pace of technological innovation simply will not permit distraction from industries' primary tasks of producing quality products at Competitive prices. The profitability, productivity and market share of Indian firms have been adversely affected by many factors, including increase in raw material price, a failure to understand customers and markets, incentives, quality procedure implementation and poor use of capital. In the present conditions of global business, most organizations have identified the competitive priorities, such as: cost, quality, dependability, flexibility and motivation. These priorities can be considered to embed in Quality Control and Total Productivity Management.

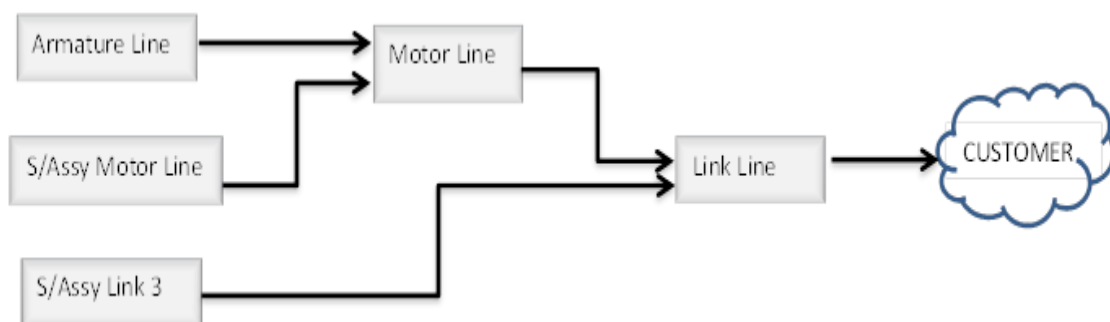


Fig. 1: Line Layout of Wiper Line

II. OBJECTIVE OF STUDY

The Wiper Link Line 3 is basically a Assembly line where the S/Assy comes from the other line for eg At link line the various S/Assy which are used are:

1. Motor Assy
2. Lever/Segment S/Assy
3. Holder S/Assy
4. Rod S/Assy

These all above mentioned S/Assy comes from other lines & assembles at Link Line & then a assembled part goes to the Customer Here below will represent the various S/Assy which are received from various lines & which are assembled at link line 3

Productivity is an average measure of the efficiency of production. It can be expressed as the ratio of output to inputs used in the production process, i.e. output per unit of input. When all outputs and inputs are included in the productivity measure it is called total productivity. Outputs and inputs are defined in the total productivity measure as their economic values. The value of outputs minus the value of inputs is a measure of the income generated in a production process. It is a measure of total efficiency of a production process and as such the objective to be maximized in production process.

III. PRODUCTIVITY MEASUREMENT

Productivity is an overall measure of the ability to produce a good or service. More specifically, productivity is the measure of how specified resources are managed to accomplish timely objectives as stated in terms of quantity and quality. Productivity may also be defined as an index that measures output (goods and services) relative to the input (labor, materials, energy, etc., used to produce the output).

Hence, there are two major ways to increase productivity: increase the numerator (output) or decrease the denominator (input). Of course, a similar effect would be seen if both input and output increased, but output increased faster than input; or if input and output decreased, but input decreased faster than output.

IV. METHODOLOGY FOR QUALITY PRODUCTIVITY IMPROVEMENT

Improvement in quality & productivity of wiper at Denso Haryana Pvt. Ltd. Through PDCA, Root cause analysis & kaizen technique

A. PDCA

PDCA: (plan–do–check–act or plan–do–check–adjust) is an iterative four-step management method used in business for the control and continuous improvement of processes and products. It is also known as the Deming circle/cycle/wheel

B. Rootcause Analysis

Root cause analysis (RCA) is a method of problem solving used for identifying the root causes of faults or problems. A factor is considered a root cause if removal thereof from the problem–fault–sequence prevents the final undesirable event from recurring; whereas a causal factor is one that affects an event's outcome, but is not a root cause. Though removing a causal factor can benefit an outcome, it does not prevent its recurrence with certainty.

C. Kaizen Techniques

Kaizen, Japanese for "improvement." When used in the business sense and applied to the workplace, kaizen refers to activities that continuously improve all functions and involve all employees from the CEO to the assembly line workers. It also applies to processes, such as purchasing and logistics, that cross organizational boundaries into the supply chain. It has been applied in healthcare, psychotherapy, life-coaching, government, banking, and other industries.

By improving standardized activities and processes, kaizen aims to eliminate waste (see lean manufacturing). Kaizen was first implemented in several Japanese businesses after the Second World War, influenced in part by American business and quality management teachers who visited the country. It has since spread throughout the world and is now being implemented in environments outside of business and productivity.

Kaizen is a daily process, the purpose of which goes beyond simple productivity improvement. It is also a process that, when done correctly, humanizes the workplace, eliminates overly hard work ("muri"), and teaches people how to perform experiments on their work using the scientific method and how to learn to spot and eliminate waste in business processes.

V. PROBLEM IDENTIFICATION

Table 1

S. No	PROBLEM	EXPECTED ROOTCAUSE
1.	Cap Cut	Not Clear

2.	Ring Snap P/F NG	Manual Press fitting Punches
3.	Uneven Load distribution at individual station of 800L model	-----
4.	High B.C.T of YE3RH model	Long Ergonomic work Area
5.	More Walk time of the operator	-----

VI. RESULT

Table 2

Parameters	Present Status	Target	Achievement	Improvement in Productivity
Manpower	21	15	14	31.4 %
Man-hour	7	7	7	
Production	2400	2100	2100	
Productivity (no. of pcs /man/hr.)	16.3	20	21.42	
From all of above Activities the Cycle time of line improved by 6.4 sec Before-26.8 sec After-20.4 sec				
Parameters	Present Status	Target	Achievement	Improvement in Quality
Manpower	1.5	0.33	0.15	90.0 %

CONCLUSION

Present work deals with improvement of **QUALITY & PRODUCTIVITY** of a Production line. The Productivity depends on the various factors i.e. man, machine, material & money in efficient way & the basic need of productivity improvement is to increase sales turn over & customer utmost satisfaction. Quality & Productivity improvement hence improve the efficiency of plant. Quality control leads to productivity improvement by using various Quality improvement techniques as shown in above case study. Such as various kaizen plans are employed to improve Quality & hence productivity. By using these plans productivity of **Wiper Link Line 3** improved by **25.15% & Quality by 90%**.

- Productivity and quality improvement does not mean that people should work harder, but smarter with better tools, techniques, processes, resources and implementation of new ideas.
- It concludes that everybody in the organization has to play a role in the quality and productivity improvement program.
- There will not be any rigid formula or practice strategy which can be universally applied to bring about quality and productivity improvement.
- Productivity & Quality can be improved by the Team effort, so there must be team sprit among employees.
- To overcome problems in an organization can be easily done with the help of productivity & quality.
- Productivity & Quality both are inter related to each other i.e. Productivity is directly proportional to Quality

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