HOW QUALITY AFFECTS PRODUCTIVITY AND PRICE IN MANUFACTURING INDUSTRIES

SUMAN KUMARI1, ANURADHA2, DR.S.K SHARMA3

1M.Tech. Scholar, Department of Mechanical Engineering, National Institute of Technology, Kurukshetra, Haryana, India
2M.Tech. Scholar, Department of Mechanical Engineering, National Institute of Technology, Kurukshetra, Haryana, India
3Professor, Department of Mechanical Engineering, National Institute of Technology, Kurukshetra, Haryana, India

ABSTRACT

In today’s competitive environment the mere success and survival of any enterprise whether it is a small scale unit or large scale enterprise depends upon the achievement and maintenance of a satisfactory level of quality, productivity, and at the same time at reasonable price with the optimum use of all the factors of production, not just one of them. An enterprise is productively efficient when it is producing its product or service at the lowest unit cost that it can. This paper describes how quality directly or indirectly affects the productivity and then cost of the product. In developing countries like in India there are so many difficulties to gain the high quality and high productivity due of many reasons.

KEYWORDS: cost of poor quality, improvement, price, productivity, quality

1. INTRODUCTION

The concept of quality existed much before the concept of productivity. There existed a belief till the first half of the twentieth century that productivity and quality are not related to each other, they can not progress together. Perhaps it was due to mindset of those people who were considered most advanced in the industrial world. But during and after the twentieth century, Japan automobile and entertainment goods overtook the American’s market. It was like a shock. People thought that they are making good quality product but after sometime it was revealed that they adopted quality as a management tool which improved the quality, productivity at the same time reducing cost by avoiding waste. Now almost all the enterprise in developed countries and also in developing countries are adopting that quality management tool and maintaining their position in the market and improving market share in this competitive era. Many Quality gurus gave their concepts and tool in the field of quality and productivity. Now it was clear that quality and productivity are related to each other. Quality directly or indirectly affects productivity and cost of the product.

2. RELATION BETWEEN QUALITY AND PRODUCTIVITY

Many researchers gave their definitions of the productivity and quality. According to a production system, it is the ratio of total output quantity to total input quantity.

\[
\text{Productivity} = \frac{\text{measure of output}}{\text{measure of input}} \quad \text{(Defines time and quality)}
\]

In short, it means the “Finished Goods” which is ready to be sold in the market. Productivity emphasis not only on the quality related issues but also the quantity. Here both the output and input should be quantified in tangible monetary terms for correct assessment. Productivity implies effectiveness in individual and efficiency in organizational performance.

Quality is also defined by so many researchers like; Juran (1974) gave the concept quality as “Fitness for use”. Crosby (1979) defined quality as “conformance to specification”. Quality is also defined as Customer satisfaction, Degree of excellence, ability of a product to perform its intended function in satisfactory manner or failure free.

2.1. Quantitative definition of quality:

\[
\text{Quality} = \frac{\text{Performance of a product}}{\text{Expectations of customer}}
\]

\[
Q = \frac{P}{E}
\]
Where Q is quality.
P is the performance of the product and E is the expectation of the customers.
   a) When P>E then the quality of product is very good.
   b) When P=E then quality of the product is satisfactory.
   c) When P<E then product is of poor quality.

Both quality and productivity are related with each other. In fact, both these concepts are concerned with the performance aspect of the system/product/service. So quality and productivity are nothing but the performance measure in different ways.

The relationship between quality and productivity may be explained with the help of following performance model:-

a) One for quality
   \[ Q = \frac{P}{E} \]

b) Another for productivity
   \[ \text{Productivity} = \frac{\text{Output}}{\text{Input}} \cdot \frac{\text{Number of finished products}}{\text{Raw product in term of money}} \]

Here number of goods and products are again an index of the performance of the production system.

Therefore both quality and productivity define or explain the performance level of a production system.

The correlation between quality and productivity may be further illustrated with the help of following block diagram:-

**FIG 1. CORRELATION BETWEEN QUALITY AND PRODUCTIVITY**

Better quality leads the lesser defects due to which the cost of poor quality will be minimum and if the poor quality is minimum, then the unproductive or unexpected (like scrap) will be minimum which further he minimum gives total cost of production. So we get the higher productivity in the production system.

Higher quality goods take more time and labor and higher quality raw material to produce, so a drive to greater productivity almost always means a diminution of quality. An exception is in cases where standardization and precision mean a significant increase of quality, as in machine parts, which can be more standard and more precise by machine, which is also more efficient. Example when you have a high quality raw material, you may have a low defect/reject. This may lead you to have high productivity. High quality of input (use small amount less defect or reject) may lead to have high output and result on high productivity.

3. PRODUCTIVITY IMPROVEMENT CHALLENGES IN BOTH PUBLIC SECTORS AND PRIVATE SECTORS:-

Productivity improvement has been a major issue for all industries and for nation also. But there are so many challenges come in achieving the higher productivity:

a) **Scarcity of resources**: It seriously affects the higher productivity. This is going to be major threat to the both developing and developed countries. The problem is uncontrolled consumption of natural resources like trees, coal, petroleum, fossil fuels etc. If nation will keep on using these resources without thinking of future, then this will be the biggest challenge to the counties than what is there today. Extractive resources are no longer declining in cost and price. It is predicted that in future, water is going to be major problem. Environmental consequences will be greater in
the upcoming days. Many of industries are not environment conscious. There is major slackness among industries. This will increase the price of the product for better quality.

b) **Lack of money and proper education:** Mostly developing countries are dependent on developed countries for borrowing money like World Bank. They are not having sufficient money for buying the new technology machinery and also they have to depend on developed countries for bringing modern technology and other resources. For getting better quality and high productivity, highly educated people are needed for this they have to pay high salary, consequently price of the product increases. Now a day, nation is facing a new problem that is corruption indirectly affects the productivity in public sectors. Although Government is open to import, the industry owners are not inclined to invest in private sectors.

c) Some of problems faced by many industries high technology machinery, non availability of electricity and water, transportation of goods, lack of training of labor, differential tax rates, irresponsibility of top management, population problems. these all lead to decrease the productivity and thus price of product will increase.

4. **CONCLUSION**

Every nation wants to increase productivity and quality of product at lower price. For this they should reduce wastage of resources and must find other substitutes that will be environment-friendly. Proper education and training of labor should be given for better quality. Government should arrange to import advanced technology and machinery on easy terms for industries. lastly, industries should understand their responsibilities if they want to improve profit and productivity and to stay in global market.

**References**