



Managing Profits through Quality Management and Engineering

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BEING the backbone of the economy of most countries, manufacturing has been badly affected by the recent drastic increase in petroleum prices worldwide and many companies are feeling the heat in terms of their financial performance. Operational costs have increased in view of the high overhead costs in the running of factories. In addition, there is a tremendous pressure being exerted on the product pricing; the need to produce the product at a lower cost due to the ever growing market competitiveness.

This is further exacerbated by the fact that the product lifecycle is getting shorter and shorter, and this contributes to an increase in production costs of the final product. One way for factories to improve their financial performance and to survive is to focus on the management of improving the quality of products produced, which normally accounts for a substantial portion of the total costs in the manufacturing and delivery of these products.

COST OF PRODUCTION OF POOR QUALITY PRODUCTS

The cost of production of poor quality products is an important subject in the field of quality management and engineering. Management staffs are always very interested in the language of money. They are being appraised and measured by how much they have contributed to the company's bottom line either directly or indirectly.

By translating and quantifying quality parameters into monetary terms, engineers can stimulate management into supporting them to tackle quality engineering issues. Without management support, engineering improvement activities are very diffi-



cult to implement because of resource allocation issues. This way, engineers can work on quality engineering issues with the aim of helping management realise the factory's financial goals.

Cost of production of poor quality products can be averted if the following four components are given due consideration:

1. Prevention costs are costs associated with long-term initiatives that are implemented to forestall quality issues. These include quality planning and engineering, reliability planning and engineering, new product review, product and process design and specification, process control, manpower training and development, and quality data acquisition and analysis which have been preset.
2. Appraisal costs are costs associated with key systems, processes control that prevent defective products or services from reaching the customers. These include inspection and test of incoming materials, product inspection and testing, quality audits, materials and services consumed, and maintaining accuracy and calibration of test equipment.

3. External failure costs are costs generated within the factory as a result of unsatisfactory performance of products or services in the field. These include liability costs, warranty charges, product service, returned product and material, and complaint and policy adjustment.

4. Internal failure costs are costs generated within the factory as a result of unsatisfactory performance of products or services in the factory. These include scrap, rework, retest, failure analysis and correction, downtime and delays, product and process redesign, scrap and rework related to vendor, excess labour and materials, yield losses, and downgrading of products or services.

MANAGING THE COST OF POOR QUALITY

For a start, usually manufacturing engineers and quality engineers are assigned to manage the cost of poor quality products of a factory. Accuracy in determining the cost is important in order to assess its significance as well as to precisely state its actual magnitude. In this respect, the

engineers need to make sure that the measurement methods for this cost are valid and correct. If need be, engineers, working together with the finance personnel, need to develop better measurement methods to ensure that accurate data are captured and analysed in order to increase the capability and accuracy of the whole system.

Ideally, out of the four components of the cost of poor quality products, it is most logical to tackle the internal failure costs first. The reason is that since this cost is incurred within the factory, it is easier to identify and control. Also, there is a tendency that if the internal cost is reduced, then the prevention cost and appraisal cost should also reduce accordingly. This is illustrated as follows.

For example, let us assume that a certain factory is facing a high scrap problem in one of the products. High scrap also translates into more testing, inspection, expediting of lots, planning, data analysis and rework of the product and its component parts. If somehow the engineer managed to reduce the scrap rate, then prevention and appraisal activities would be reduced as well. And if the improvement is such that there is almost none or very minimum quantity of scrap present, then rather than conducting a full test or inspection, the factory can opt for periodical sampling testing and inspection of the finished product, which drastically reduces the appraisal cost.

Based on the cost of quality tabulated, engineers can use Pareto analysis to help them prioritise the quality issues identified. This will ensure that high profile and critical quality issues are tackled and resolved first. Also, issues related to capacity and bottleneck can be identified and solved expediently.

VENDOR ENGAGEMENT

Vendor engagement serves two purposes. Firstly, by actively working and negotiating with the vendor, the factory can achieve raw material cost down. Working closely with the vendor is usually the task of the

supplier/product quality engineers. To realise this, supplier/product quality engineers need to build a close rapport and mutual trust with the vendors. Through trust, vendors will share with the supplier/product quality engineers its product and process details. This will open up possibilities for further in-depth study and analysis of the vendor processes on both sides. The improvement and cost savings realised by this cooperation can be shared by the factory and the vendor.

Secondly, the factory can form a long-term partnership with the vendors to develop new products and processes. The benefits of this kind of partnership are the sharing of developmental expenses as well as the reduction on developing time. By participating in the product developmental process, the vendor is assured of some business if the product is successfully launched into the market.

FINAL REMARKS

By measuring and managing the cost of poor quality, manufacturing and quality engineers should be able to identify opportunities for further improvement and hence reduce the operational costs of the factory. Similarly, supplier/product quality engineers working with vendors can also bring about the substantial raw material cost down and the sharing of product developmental costs. All these effort will undoubtedly bring profits to the factory. In the final analysis, it is definitely worthwhile for engineers to look at the quality aspects of an organisation in a more focused and enlightened way as it opens up more possibilities for the organisation to perform at a higher and competitive level. ■

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