

Quality and Its Costs

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For many years, Americans and American industry have found themselves in a position of great privilege within the world economy. Spectacular amounts of untapped resources and vast amounts of land in which to work them enabled our country's economy, unchallenged, to build itself into a colossus. Unlike industrial development in European society, where centuries of political divisiveness or territorial constraints imposed substantial social costs on unbridled economic growth, American industry did not pay the full costs of its expansion. Conservation and efficient use of resources were virtually unheard-of. Environmental concerns and external costs were never a point of contention. America not only produced more, it consumed more during production—much more. Until recently, few restraints had been placed on these industrial advantages, but now, as global competition grows and restrictions on American industry abound, the concept of quality has come to the forefront of corporate culture.

Why has quality control been implemented?

Previous to the mid-1960s, American entrepreneurial spirit was the main impetus behind the perception of quality associated with American-produced goods and services, especially on the domestic front. It was not necessary to produce products efficiently from raw materials or tightly control production processes and the amount or cost of labor because a significant value-to-price ratio could be maintained without such considerations. Only after substantial increases in energy and environmental costs were U.S. corporations forced to contend with the quality control aspect of production. The first manifestations of this new concern were brought about by the influx of inexpensive, well-made foreign goods to the U.S., particularly Japanese automobiles and consumer electronics. American management, in order to compete in a changing market, was now faced with the problem of implementing quality control procedures and reconciling their costs.

How did quality control originate?

W. Edwards Deming is considered by most persons involved in industry to be the father of quality control. His statistical models and general overview of the quality concept have been examined and adopted worldwide. In an attempt to define the quality concept, Deming advocates a philosophy consisting of six basic principles:

Quality is defined by the customer.

Understanding and reducing variation in every process is a must.

All significant, long-lasting quality improvements must emanate from top management's commitment to improvement, as well as its understanding of the means by which systematic change is to be achieved.

Change and improvement must be continuous and all-encompassing. It must involve every member in an organization, including outside suppliers.

The ongoing education and training of all the employees in a company is a prerequisite for

achieving the sort of analysis that is needed for constant improvement.

Performance ratings that seek to measure the contributions of individual employees are usually destructive (Riha-Belkaoui 3).

In addition, Deming also provides fourteen steps that would implement this philosophy and help the management of companies attain a goal of quality. He believes firmly that participation in a quality control program must occur at all levels of an organization (Dumas, Cushing, and Laughlin 30).

Joseph Juran, another advocate of quality control, and Deming, both Americans, lectured widely overseas on their theories after World War II and were instrumental in influencing the adoption of quality control procedures by Japanese industry. The Japanese, with limited access to costly resources, found it imperative to exclude waste and inefficiency from industrial operations in order to enter world markets and took these theories to heart. As a means for gaining market share, concern for customer satisfaction and long-run planning became paramount. It would only be a matter of time until this new industrial policy, originally formulated by Americans, would return to American shores in the form of well-crafted, price competitive products.

How can quality be quantified?

Almost all experts now agree that quality can be examined only through the eyes of the customers of a particular good or service. Previous to instituting formal programs of quality control, companies routinely depended on the evaluation of criteria developed in-house when determining how their products or services “stacked-up” against those of their competitors. Frequently, these measures were concerned only with what management considered to be the primary purpose of the product or service and not with peripheral issues regarding its acquisition or use that may have been equally or more important to the customer. Customers’ true quality considerations, however, can be ascertained through polling or other marketing devices, and the appropriate data can then be collected and analyzed.

Benchmark comparison or the development of standards is necessary to give meaning to any data assembled to measure particular aspects of quality performance. Information used to set standards can be separated into the categories of *hard* data, quantitative numerical data, and *soft* data, qualitative data not associated with numbers. A point to note regarding the setting of standards is that single measures and historical values are rarely appropriate. “Benchmarking” is similar to the use of standards in that it compares the performance data for a particular activity to a desired goal. In this case, though, the measuring standard is a well established one that has already been attained and surpassed in the industry. Striving for performance in this manner focuses efforts to increase customer satisfaction and subsequently, market share.

Improvement in quality does not have to be of a breakthrough nature. It can be accomplished gradually if each member of the organization is given a “customer” to satisfy (even if internal) and is also encouraged to

measure his or her own progress. If there is to be one overall measure of company conformance to quality, it is one determined solely by its customers, that is, company growth (Smith 86-88).

How are quality control costs incurred and classified?

Contemporary cost of quality (COQ) programs, as advocated by the American Society for Quality Control (ASQC) and other agencies, frequently divide costs into four categories: the two conformance costs of prevention and appraisal and the two nonconformance costs of internal and external failure (Carr 73). Conformance costs are the costs of meeting customer requirements and are associated with the production process in a manufacturing environment. Prevention costs are incurred before production by attempting to prevent the manufacture of products that deviate from their specifications. Prevention costs can include expenditures for maintenance, inspection, and engineering. Appraisal costs develop once production has begun from attempts to isolate products that do not meet specifications. These costs include testing and evaluation of the first units produced, both in-house and in the field. Isolating anomalies in product quality at the conformance stage is the most cost effective option, and control and accounting systems that facilitate this possibility are preferred.

Nonconformance costs, in contrast, rise from the failure to meet the requirements of customers and are incurred after substantial production has taken place. Internal failure costs occur before a product is delivered when it is determined that it fails to meet the needs of customers. External failure, the most costly type of product failure, is discovered by the customer after taking possession of the product. Both types of nonconformance costs include reworking and waste costs, while external failure can incur the added detriment of customer alienation and reduction in sales. Nonconformance costs arise not only from product specifications below customer requirements but also from those exceeding customer requirements (Shaw 52).

Individual companies can identify other categories of quality costs. Xerox USMG, the U.S. marketing group for Xerox Corporation and a service-based division, has successfully adopted the COQ program of its parent manufacturing company and considers "lost opportunities" to be a major quality cost classification. Lost opportunity costs are defined as the impact on profit of lost revenues and include such situations as a customer's choice of a competitive product, an order canceled because of inadequate service, or an inappropriate equipment purchase that results in the loss of the customer (Carr 73).

How can quality costs be recorded and presented?

Recent developments in cost accounting techniques and manufacturing technologies have enabled a more accurate identification of the components of quality costs. The just-in-time (JIT) production philosophy and flexible manufacturing systems (FMS) are designed to significantly reduce non-value added activities and their associated costs (Riahi-Belkaoui 65). Activity based costing identifies specific activities that drive the costs of products. Together with computer-integrated manufacturing (CIM), which allows all facets of

manufacturing to be scheduled and coordinated by computer, these developments provide for unprecedented collection, organization, processing, and presentation of data, both financial and otherwise, for control and reporting purposes. Individual cost drivers can then be measured, placed in the appropriate quality cost category, and the corresponding costs calculated (Riahi-Belkaoui 72-73). Cost reports can be in any form deemed relevant by management and will usually contain absolute amounts and percentages. Deviations from target amounts and data from past periods can also be included for comparison.

What will make quality control successful?

“Instrumental...to the success of any quality approach are the skills of human interaction, leadership, and initiative abilities” (Dumas, Cushing, and Laughlin 33). No program of quality control can succeed without the enthusiastic participation of the employees in all levels of an organization. Senior management must support mid-level managers, who in turn must provide inspiration and recourse to subordinates and be willing to carefully evaluate their input. Employees should be encouraged to become involved early in the process. Preconceptions of a person’s lack of knowledge or ability to contribute constructively must be cast aside, and managers should make a point to rightfully give credit where it is due (Lansing 42). In this way, the human resources of an organization can be synergistically integrated into the mechanics of the quality control process, providing maximum efficacy with minimum effort.

Works Cited

Riahi-Belkaoui, Ahmed. *Quality and Control: An Accounting Perspective*. Westport, CT: Quorum, 1993.

Smith, Steve. "How to Quantify Quality." *Management Today* Oct. 1987: 86-88.

Dumas, Roland A., Nancy Cushing, and Carol Laughlin.
"Making Quality Control Theories Workable."
Training & Development Journal 43.6
(February 1987): 30-33.

Shaw, Donald. "Internal Audit and Quality Improvement."
The Internal Auditor Dec. 1986: 50-53.

Lansing, Rick L. "Cost cutting/profit making ideas."
Management Solutions Oct. 1988: 39-42.

Carr, Lawrence P. "Applying Cost of Quality to a Service Business."
Sloan Management Review Summer 1992: 72-77.