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QUALITY COSTS - Compendium

Cost of Quality: $COQ = COPQ + COAQ$

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All key indicators in an organisation are measured in very specific terms, usually in Rand and Cents. Unless the COST of QUALITY is also measured in the same terms as expenditure and utilisation - it is unlikely to be taken seriously. This is the fundamental reason for having a Cost of Quality (COQ) system.

Product quality is traditionally described as being good or bad, awful or excellent. These measures however fail to provide a clear picture of whether product or process quality levels are improving or not. Process quality can only

be managed and improved once it is measured in a manner that is clearly understood.

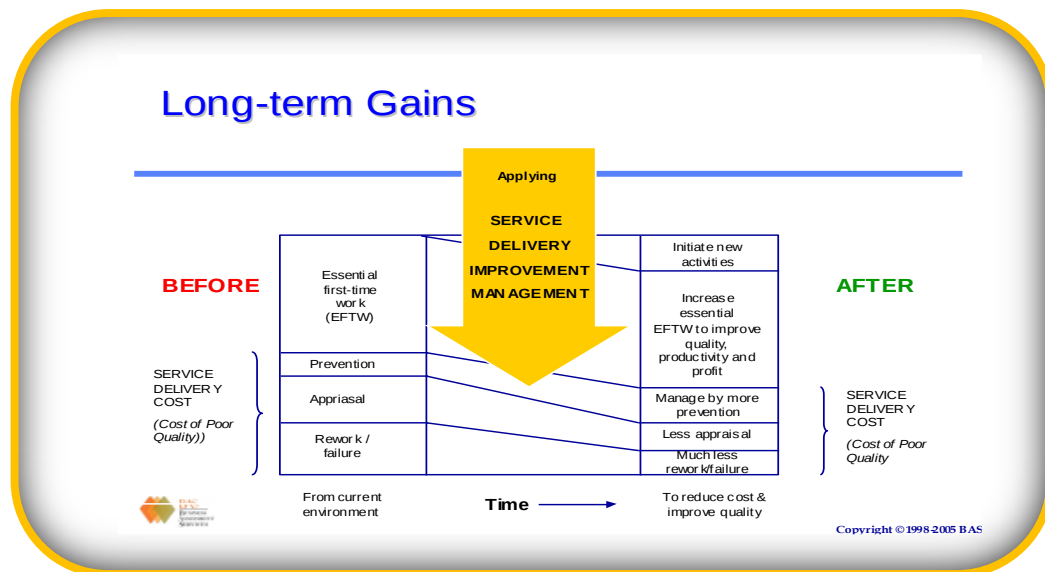
Why Cost of Poor-Quality Measurement?

Today more so than ever before Cost of Quality or Cost of Poor Quality (COPQ) as it is sometimes called - especially in the manufacturing environment - is recognised and appreciated as the outcome or consequence of good or poor process management.

For many organisations, COQ accounts for more than 20% - 40% of sales or operating budget. Studies have shown that product/service quality is the most important determinant of market share and profitability. Delighted customers are satisfied with the features provided,

“Stop worrying about quality, productivity, cost, and cycle time. Focus your energies on organisational and process performance improvement and all the rest will follow”

Dr H James Harrington



attracted by the innovative approaches to their needs, and not dissatisfied with deficiencies.

Process and product quality can have different meanings to different people. Dr Joseph Juran supports a holistic approach to quality and defines quality as both "**product features**" and "**freedom from deficiencies**". Both definitions relate to the effect of process and management quality on the economics of the organisation.

One definition of product quality relates to "**product features**". The Rolls Royce is a classic example of providing many (and sumptuous) product features and a tradition of service that treats the owners like royalty. Product features can have a major effect on revenue because higher quality can result in the ability to charge premium pricing.

The second definition of quality is "**freedom from deficiencies**", i.e., fewer things go wrong. Freedom from deficiencies has a major impact on reducing costs because the higher quality, in this case, means no scrap or rework,

fewer claims, and fewer customer complaints.

"**Product features**" as well as "**freedom from deficiencies**" are essential in delighting customers.

Together, improved quality and lower costs can have a positive impact on financial performance.

Process Output Improvement

While the quality level of a process will vary from day to day, the average performance and the range of variation are constant over time. The level of performance is inherent in the process and is often referred to as chronic waste, it was planned that way. The Process Control zone depicts the accepted average and range of variation in process quality. This zone is often adopted as the standard of performance. In the Dr Juran Quality Control zone, process quality will sometimes fall outside the accepted or standard range of variation. This calls for firefighting to re-establish quality levels within the standard.

Firefighting or problem-solving in the Quality Control Zone is important, but problem-solving in the Quality Improvement zone has an even greater impact. The goal of quality improvement is to reach a new level of performance, never achieved before.

All work is a Process

A process can be considered a series of productive actions resulting in a product/ service that satisfies the needs and desires of customers. It can therefore be said that every job or activity is a process, or part thereof.

Organisations, therefore, need a “quality” approach to managing for quality that focuses on the processes used, inclusive of the standards, procedures, equipment and facilities, training and knowledge, to continually improve and fine-tune those processes. To meet customer expectations, process owners need to identify and understand customer requirements and prevent problems or dissatisfaction. This is the basis of continuous improvement in all areas and activities.

Quality Improvement System

Deming claims that 85% of our “quality”

The Cost of Quality (COQ) can be defined as the cost of trying to achieve quality with an imperfect process and is the total expense of:

$$\text{COQ} = \text{POAQ} + \text{COPQ}$$

**POAQ (prevention + appraisal) plus
COPQ (cost of rework + waste)**

problems, in general, are directly

attributable to the processes we use to get things done. To deliver acceptable quality, policies and systems are required to ensure that all (internal and external) customer requirements are met on time and within budget. Therefore, the most effective way to improve both process quality and productivity is to improve the processes and procedures that are used to manage and develop products or services. Employees must therefore be provided with the policies, tools and skills to operate (manage) their work processes in a manner that prevents non-conformance.

A quality improvement system should accordingly be based on the principle of prevention of non-conformance to customer requirements. Prevention involves communicating, planning, proofing and working in a way that eliminates opportunities for any non-conformances.

Cost of Quality Measurement

Financially oriented executives who are driven by budgets and targets often run organisations. Often the quality of products and services are regarded as a negotiable item and given attention when the time can be found. On the other hand, all key indicators in an organisation are measured in very specific terms, usually in Rand and cents. Unless the quality of goods and services are also measured in the same terms as expenditure and utilisation - it is unlikely to be taken seriously. This is the fundamental reason for having a Cost of Quality (COQ) system.

Product and service quality is traditionally described as being good or bad, awful or excellent. These measures however fail to provide a clear picture of whether quality levels are improving or

not. Output quality can only be managed and improved once it is measured in a manner that is clearly understood.

Organisations, therefore, need to measure quality output to:

- *Focus on areas needing improvement*
- *Prioritise opportunities so that time is spent on the important issues*
- *The Previous measurement is used as the baseline for future improvement*

Total Operating Cost vis-à-vis Cost of Quality (COQ)

The total operating cost (TOC) consists of the total Essential First Time Work (EFTW) expenditure and the Cost of Quality (COQ).

In an ideal world, work done to satisfy customer requirements would be complete and done "right the first time". However, in the real world, product and service requirements do change, schedules may slip or changes may be required before delivery to the customer. After delivery, customers may find the product or service may not work as expected or is unsuitable for their purpose. The resultant remedial process activities are normally designed to identify, prevent and correct potential problems. The expenses and costs associated with these additional work activities are generally referred to as Costs of Quality.

- *Price of Attaining Quality (POAQ) = Prevention and appraisal expenses referred to as "Conformance Costs".*
- *Cost of Poor Quality (COPQ) = Rework and waste (failure) costs referred to as "Non-conformance Costs".*

Price of Attaining Quality (POAQ)

When we calculate COQ, we discover how much it costs us not to meet the requirements the first time, every time. The Price of Attaining Quality (POAQ) is the **"PRICE"** associated with appraisal and prevention. This is called the controllable process expenses.

Prevention is defined as the investment (controllable price) to prevent non-conformance with customer requirements. An appraisal is aimed at measuring the degree of conformance.

Cost of Poor Quality (COPQ)

Cost of Poor Quality is defined as the cost of doing things wrong, (poor process management) and is the total cost of failure/rework. COPQ is sometimes also referred to as either the Cost of Non-Conformance (CONC) or Price of Non-conformance, wasted time, money and effort and is a "price" that need not be paid.

Benefits of COQ measurement

Quantifying the size of the process problem in a language that will have an impact on upper management, i.e.:

- *Rands and cents*
- *Getting management attention*
- *Understanding work activities and the cost of errors made*
- *Directing and justifying corrective action*
- *Identify major opportunities for cost reduction*
- *Estimating the financial potential for process improvement & set of goals/targets*
- *Sustaining management commitment & motivating management to commit full support to reduce COQ.*

Showing Management, the benefits of COQ

In the long term as COQ is reduced, additional resources are made available for essential, first-time work and new opportunities. Ongoing application of the COQ methodology in process management helps to reduce the need for activities that are directed at discovering and correcting failures and defects.

The COQ results can have a remarkable impact on management. The typical relationships with big impact are:

- *Total COQ*
- *COQ as a percentage budget or operating expense*
- *COQ compared to doing it the first time right*
- *Effect of COQ on the break-even point*

Other critical success factors also help top management to understand and influence COQ:

- *COQ system must be part of a long-range strategy initiated and supported by top management.*
- *Co-operation and commitment to improvement, cost reduction is a by-product of quality improvement*
- *Process quality should be focused on customer satisfaction and process improvement*
- *Do not focus on operational areas only. Many of the biggest COPQ items may lurk in marketing, finance, and human resources.*
- *Use the Pareto principle and track the 20% items that cause 80% of COQ.*
- *Beware of planning and analysis paralysis, settle for a simple, if incomplete system, and start working on quality improvement.*

Management Actions

More than most management for quality initiatives, COQ measurement requires management to understand the significance of the concept and the value it can add. Specific focus areas should include:

- *Explain the concept of measuring process quality in terms of the cost of poor quality*
- *Identify activities/elements that result in poor quality*
- *Teach employees to keep a record of the cost of poor quality in their area of influence*
- *Facilitate COQ data collection*
- *Analyse COQ data*
- *Use the results of the COQ measurement to set priorities; justify corrective actions that need to be taken, track improvement, and show the impact of corrective action*
- *Recognise participation and improvement in process quality.*