

Performance Measurement

Introduction

Performance measurement is a fundamental building block of TQM and a total quality organisation. Historically, organisations have always measured performance in some way through the financial performance, be this success by profit or failure through liquidation.

However, traditional performance measures, based on cost accounting information, provide little to support organisations on their quality journey, because they do not map process performance and improvements seen by the customer. In a successful total quality organisation, performance will be measured by the improvements seen by the customer as well as by the results delivered to other stakeholders, such as the shareholders.

This section covers why measuring performance is important. This is followed by a description of cost of quality measurement, which has been used for many years to drive improvement activities and raise awareness of the effect of quality problems in an organisation.

A simple performance measurement framework is outlined, which includes more than just measuring, but also defining and understanding metrics, collecting and analysing data, then prioritising and taking improvement actions. A description of the balanced scorecard approach is also covered.

Why measure performance?

'When you can measure what you are speaking about and express it in numbers, you know something about it'.

Kelvin

'You cannot manage what you cannot measure'.

Anon

These are two often-quoted statements that demonstrate why measurement is important. Yet it is surprising that organisations find the area of measurement so difficult to manage.

In the cycle of never-ending improvement, performance measurement plays an important role in:

- Identifying and tracking progress against organisational goals
- Identifying opportunities for improvement
- Comparing performance against both internal and external standards

Reviewing the performance of an organisation is also an important step when formulating the direction of the strategic activities. It is important to know where the strengths and weaknesses of the organisation lie, and as part of the *'Plan – Do – Check – Act'* cycle, measurement plays a key role in quality and productivity improvement activities. The main reasons it is needed are:

- To ensure customer requirements **have** been met
- To be able to set sensible **objectives** and comply with them
- To provide **standards** for establishing comparisons
- To provide **visibility** and a "scoreboard" for people to **monitor** their own performance level
- To highlight **quality problems** and determine areas for **priority attention**
- To provide **feedback** for driving the improvement effort

It is also important to understand the impact of TQM on improvements in business performance, on sustaining current performance and reducing any possible decline in performance.

Cost of quality measurement

The cost of doing a quality job, conducting quality improvements and achieving goals must be carefully managed, so that the long-term effect of quality on the organisation is a desirable one. These costs must be a true measure of the quality effort, and are best determined from an analysis of the costs of quality. Such an analysis provides:

- A method of assessing the effectiveness of the management of quality
- A means of determining problem areas, opportunities, savings and action priorities

Cost of quality is also an important communication tool. Crosby demonstrated what a powerful tool it could be to raise awareness of the importance of quality. He referred to the measure as the "*Price of Non-conformance*", and argued that organisations chose to pay for poor quality.

Quality-related activities that will incur costs may be split into prevention costs, appraisal costs and failure costs.

Prevention costs are associated with the design, implementation and maintenance of the TQM system. They are planned and incurred before actual operation, and could include:

- Product or service requirements – setting specifications for incoming materials, processes, finished products/services
- Quality planning – creation of plans for quality, reliability, operational, production, inspection
- Quality assurance – creation and maintenance of the quality system
- Training – development, preparation and maintenance of programmes

Appraisal costs are associated with the suppliers' and customers' evaluation of purchased materials, processes, products and services to ensure they conform to specifications. They could include:

- Verification – checking of incoming material, process set-up, products against agreed specifications
- Quality audits – check that the quality system is functioning correctly
- Vendor rating – assessment and approval of suppliers, for products and services

Failure costs can be split into those resulting from internal and external failure.

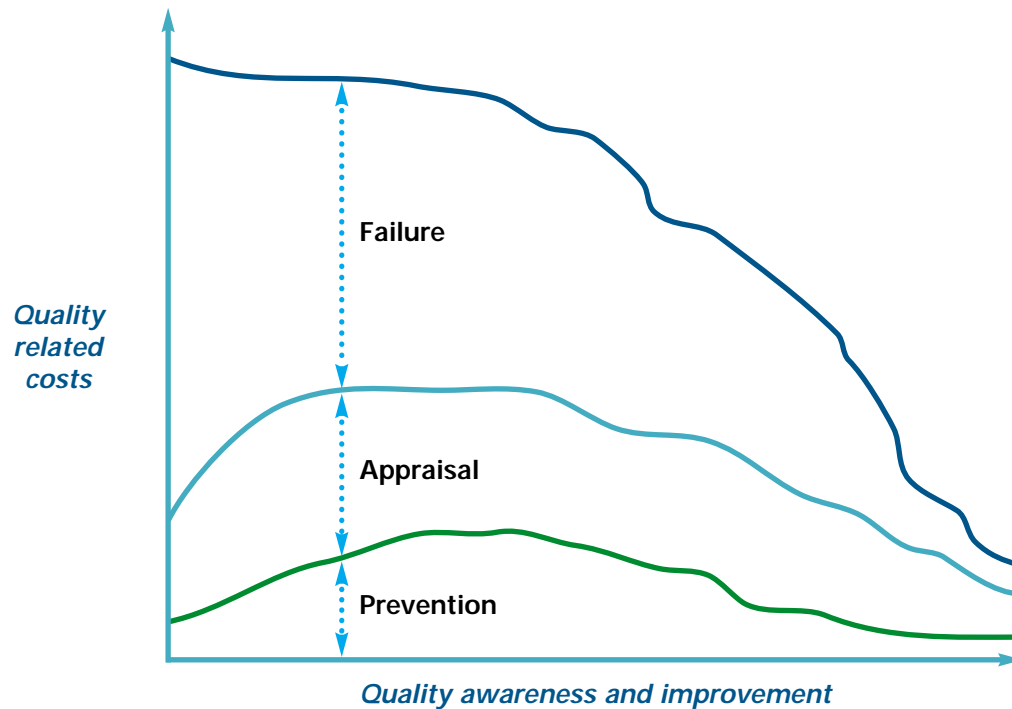
Internal failure costs occur when the results of work fail to reach designed quality standards and are detected before they are transferred to the customer. They could include:

- Waste – doing unnecessary work or holding stocks as a result of errors, poor organisation or communication
- Scrap – defective product or material that cannot be repaired, used or sold
- Rework or rectification – the correction of defective material or errors
- Failure analysis – activity required to establish the causes of internal product or service failure

External failure costs occur when the products or services fail to reach design quality standards, but are not detected until after transfer to the customer. They could include:

- Repairs and servicing – of returned products or those in the field
- Warranty claims – failed product that are replaced or services re-performed under a guarantee
- Complaints – all work and costs associated with handling and servicing customers' complaints
- Returns – handling and investigation of rejected or recalled products, including transport costs

The relationship between the quality-related costs of prevention, appraisal and failure (the P-A-F model) and increasing quality awareness and improvement in the organisation is shown graphically as:



Expenditure on prevention and improvement activities is an investment from which a return is expected. Effective quality improvements should result in a future stream of benefits, such as:

- Reduced failure costs
- Lower appraisal costs
- Increased market share
- Increased customer base
- More productive workforce

Many organisations will have true quality related costs as high as 15% of their sales revenue, and effective quality improvement programmes can reduce this substantially, thus making a direct contribution to profits.

An alternative to the P-A-F model is the Process Cost Model, which categorises the cost of quality (COQ) into the cost of conformance (COC) and the cost of non-conformance (CONC), where:

$$\text{COQ} = \text{COC} + \text{CONC}$$

COC is the process cost of providing products/services to the required standards, by a given specified process in the most effective manner.

CONC is the failure cost associated with a process not being operated to the requirements, or the cost due to the variability of the process.

To identify, understand and reap the cost benefits of quality improvement activities the following fundamental steps should be included in the approach:

- Management commitment to finding the true costs of quality
- A quality costing system to identify, report and analyse quality related cost
- A quality related cost management team responsible for direction and co-ordination of the quality costing system
- The inclusion of quality costing training to enable everyone to understand the financial implications of quality improvement
- The presentation of significant costs of quality to all personnel to promote the approach
- Introduction of schemes to achieve maximum participation of all employees

The system, once established, should become dynamic and have a positive impact on the achievement of the organisation's mission, goals and objectives.

A simple performance measurement framework

A good performance measurement framework will focus on the customer and measure the right things. Performance measures must be:

- Meaningful, unambiguous and widely understood
- Owned and managed by the teams within the organisation
- Based on a high level of data integrity
- Such that data collection is embedded within the normal procedures
- Able to drive improvement
- Linked to critical goals and key drivers of the organisation

There are four key steps in a performance measurement framework - the strategic objectives of the organisation are converted into desired standards of performance, metrics are developed to compare the desired performance with the actual achieved standards, gaps are identified, and improvement actions initiated. These steps are continuously implemented and reviewed:



Initially, focus on a few key goals that are critical to the success of the organisation or business, and ensure they are SMART, i.e:

Specific

Measurable

Achievable

Relevant

Timely

To assist in the development of these goals, consider the use of a balanced scorecard, as discussed in the following section.

Once the goals have been defined, the next step in developing a performance measurement framework is to define the **outcome metrics** - what has to be measured to determine if these goals are being achieved. If it is difficult to define outcome metrics for a particular goal, it is possible that the goal is either not "SMART" or critical to the success of the business.

For each outcome metric, brainstorm candidate **drivers** by answering the question, "*What measurable factors influence this outcome?*" Once the list is complete, select those with greatest impact, and these, the most important drivers, should have **driver metrics**, and be put in place first. Driver metrics at one level will be outcome metrics at the next level down.

An organisation needs to evolve its own set of metrics, using any existing metrics as a starting point in understanding current performance. To ensure they trigger the improvement cycle, they should be in three main areas:

$$\text{Effectiveness} = \frac{\text{Actual output} \times 100\%}{\text{Expected output}}$$

This is about the process output, and doing what you said you would do. The effectiveness metrics should reflect whether the desired results are being achieved, the right things being accomplished. Metrics could include quality, e.g., grade of product or level of service, quantity, e.g., tonnes, timeliness, e.g., speed of response, and cost/price, e.g., unit cost.

$$\text{Efficiency} = \frac{\text{Resource actually used} \times 100\%}{\text{Resources planned to be used}}$$

This is about the process input, e.g., labour, staff, equipment, materials, and measures the performance of the process system management. It is possible to use resources efficiently, but ineffectively.

$$\text{Productivity} = \frac{\text{Outputs}}{\text{Inputs}} \quad \text{which can be quoted as:}$$

$$\text{Expected productivity} = \frac{\text{Expected output}}{\text{Resources expected to be consumed}} \quad \text{or}$$

$$\text{Actual productivity} = \frac{\text{Actual output}}{\text{Resources actually consumed}}$$

Simple ratios, e.g., tonnes per person-hour, computer output per operator day, are used.

Next, design a data collection/reporting process using the following steps:

- Set up a system for collecting and reporting data
- Write clear definitions
- Agree method for establishing current performance (if not already determined)
- List resources required to support the design
- Agree data formats and classifications for aggregation and consolidation
- Identify possible sources of benchmark data
- Set reporting calendar
- Establish roles and responsibilities
- Detail training requirements
- Validate with process stakeholders

The gap between current and desired performance now has to be measured. Some of the metrics already exist and their current performance data must be collected, as well as data for new metrics.

Once all the data has been collected to identify the current performance, the target level of performance for the medium- and long-term must be decided. These performance levels must be achievable, and should be broken down into targets for discrete short-term intervals, *e.g.* the next three quarters.

To implement the performance measurement framework, a plan with timescales and designated responsibilities is needed. Once the plan has been implemented and data collected, new baselines can be set, comparisons made and new standards/targets set.

The metrics, targets and improvement activities must be cascaded down through the organisation, involving people and teamwork in the development of new metrics, data collection and improvement activities.

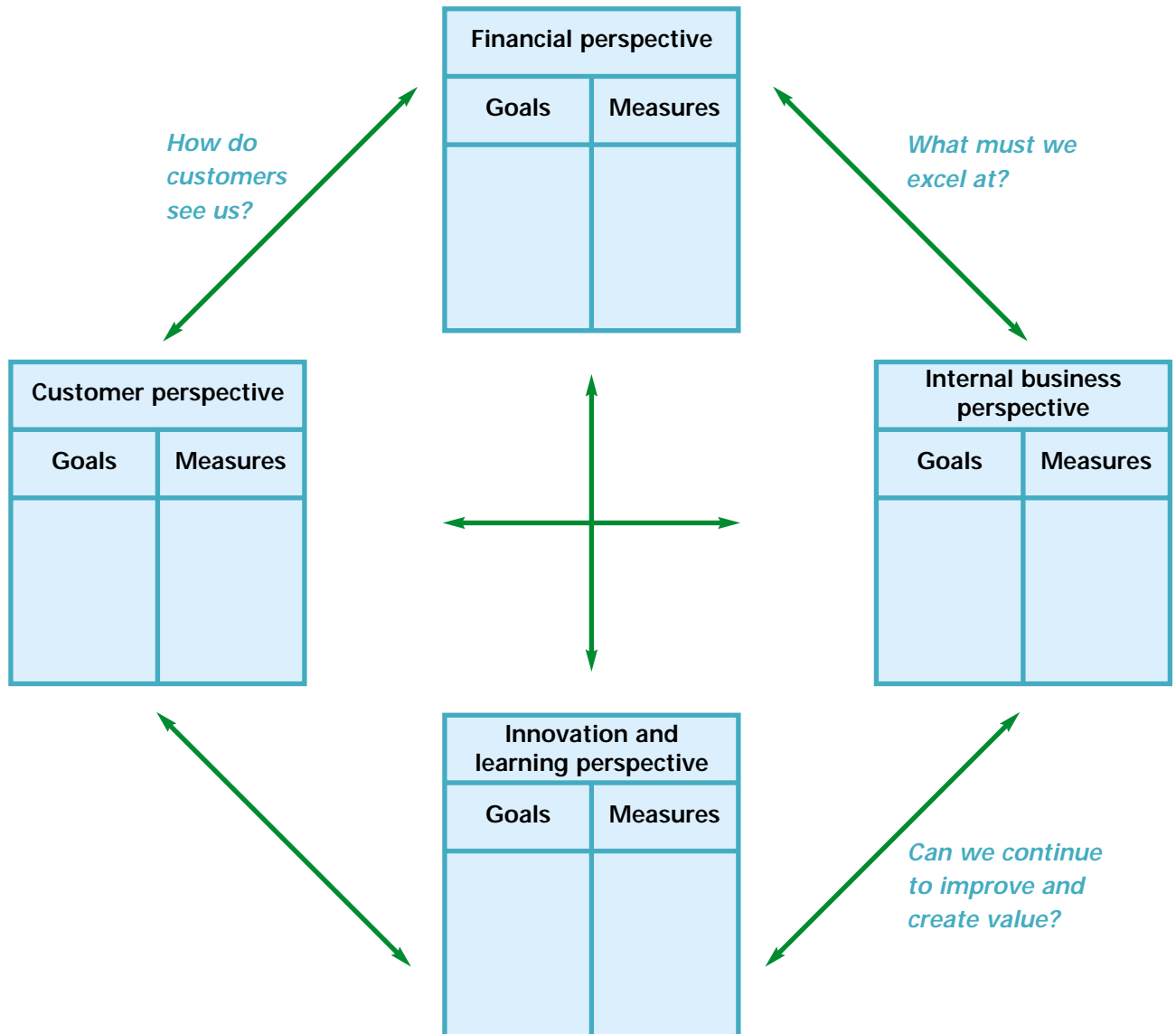
Improvement can be initiated by examining the gaps between current and target performance of the driver metrics at each level. A minimum, achievable set of actions is determined, with plans, assigned responsibilities and owners.

The critical elements of a good performance measurement activity are very similar to those required for a total quality improvement activity:

- Leadership and commitment
- Good planning and a sound implementation strategy
- Appropriate employee involvement
- Simple measurement and evaluation
- Control and improvement

The balanced scorecard approach

First developed by Kaplan and Norton, a balanced scorecard recognises the limitations of purely financial measurement of an organisation, which is normally short-term measurement.



A scorecard has several measurement perspectives, with the original scorecard having financial, customer, internal business and innovation and learning perspectives. Balanced scorecards are normally a key output from the strategy formulation process.

The key goals that are identified as being critical to the success of the business, as part of a performance measurement framework, can also be considered in the context of a balanced scorecard.

A balanced scorecard derived from the EFQM Excellence Model® (discussed in the Excellence section) would include financial and non-financial results, customer results, employee results and societal results.