



Impact of TQM practice on performance measurement

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Abstract

Measuring performance of organization is to diagnose the organization to make the necessary and effective changes in all the functional departments. The major functional areas of organization which affect the quality are operational performance and financial performance. The aim of the paper is to have a depth look into the past research carried by researchers and industrial people. Measuring performance is dynamic so that remain relevant and continue to reflect the issues important to any business. There are a number of models of performance measurement which can be used by industrial management and engineers. The importance of performance measurement has increased with the realization that to be successful in the long-term requires meeting (and therefore measuring performance against) all stakeholders' needs including customers, consumers, employees, suppliers, local community stakeholders, and shareholders. While the importance of performance measurement is difficult to quantify it is evident that in virtually all texts, research, and case studies on organizational improvement, that performance measurement plays a central role.

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1. Introduction

Performance is the process whereby an organization establishes the parameters within which programs, investments and acquisitions are reaching the desired results.

The need to measure the performance cannot be overemphasized as it's the only way we can know how well we are achieving our set goals, knowing as well how much of deviations we have also taken.

It should be clear that the determination of good performance is dependent upon the perspective from which that performance is being considered and that what one stakeholder grouping might consider to be good may very well be considered by another grouping to be poor performance (Child, 1984). The evaluation of performance therefore for a business depends not just upon the identification of adequate means of measuring that performance but also upon the determination of what good performance actually consist of.

Just as the determination of standards of performance depends upon the perspective from which it is being evaluated, so too does the measurement of that performance, which needs suitably relevant measures to evaluate performance, not absolutely as this has no meaning, but within the context in which it is being evaluated. From an external perspective

therefore a very different evaluation of performance might arise, but moreover a very different measurement of performance, implying a very different use of accounting in that measurement process, might arise.

The measurement of stakeholder performance is perhaps even more problematic than the measurement of financial performance. Objective measures of stakeholder performance are not reported in the annual reports of companies so subjective measures are considered. These measures provide a reputation rating, as gathered from 'rivals' perceptions, in nine categories and these measures are also added to also provide a total score. The nine categories are

- Quality of management
- Quality of goods and services
- Capacity to innovate
- Quality of marketing
- Ability to retain top talent
- Community and environmental responsibility
- Financial Soundness
- Value as long-term investment
- Use of corporate assets

2. Aspect of Performance

One factor of importance to all organizations, which comes from its control system, is the factor of performance measurement and evaluation. To evaluate performance it is necessary to measure performance and Churchman (1967) states that measurement needs the following components:

- Language to express results;
- Specification of objects to which the results will apply;
- Standardization for transferability between organizations or over time;
- Accuracy and control to permit evaluation;

Kimberley, Norling and Weiss (1983) also make this point and argue that traditional measures do not necessarily even measure some aspects of performance and certainly lead to inadequate and misleading evaluations of performance.

3. Understanding and assessment of performance measurement within any organization

The main issues requiring consideration by management are:

- linking performance to strategy
- setting performance standards and targets
- linking rewards to performance
- Considering the potential benefits and problems of performance measures.

In attempting to establish a clear link between performance and strategy it is vital that management ensures that the performance measures target areas within the business where success is a critical factor. The performance measures chosen should:

- Measure the effectiveness of all processes including products and/or services that have reached the final customer
- Measure efficiency in terms of resource utilization within the organization
- Comprise an appropriate mix of both quantitative and qualitative methods
- Comprise an appropriate focus on both the long-term and short-term
- Be flexible and adaptable to an ever-changing business environment.

The last point stresses how important it is that performance measurement systems are dynamic so that they remain relevant and continue to reflect the issues important to any business. There are a number of models of performance measurement which can be used by management.

4. Literature Review

Numerous studies are reported in the literature on the link

between TQM practice and organizational performance. The most widely cited empirical study on quality practices to date is the International Quality Study conducted by Ernst & Young and discussed by Bemowski (1991).

The most profound impact of TQM on organizational performance has been in the Australian Automotive Industry. It is observed in the literature that quality practice has significant positive impacts on performance measures for process utilization, process output, production costs, work-in-process inventory levels, and on-time delivery. It is found in several studies claim that TQM does have a significantly positive effect on organizational performance. However, these studies were found to suffer from methodological shortcomings and small sample sizes.

Manufacturing organization is more likely to achieve better performance in employee relations, customer satisfaction, operational performance and business performance, with TQM than without TQM.

Flynn et al. (1994) argued that the cornerstone for theory building is enunciation of the distinction between quality management practices (inputs) and quality performance (outputs), which, until then, had been lumped together under the broad heading of quality. Madhu et al. (1996) reasoned that, although many conceptual models do claim the utility of certain quality dimensions (such as customer satisfaction, employee satisfaction and employee service quality) in improving organizational performance, no empirical study till that time had verified such claims. In their empirical work, Madhu et al. (1996) investigated the effect of the quality dimensions on nine component items that would make up organizational performance for both manufacturing and service firms. The measures used for the three quality dimensions and organizational performance were shown to be reliable and valid. However, information derived from the study indicated that, when compared to manufacturing, practicing managers in the service sector seem not to have understood some of the relevance and values of quality management activities.

Predicting bottom-line results from TQM is difficult because one of the central messages of TQM is that it is a long-term process; 5-10 years is the period often mentioned in the literature as needed to achieve a quality organization, (search). We found several studies that claim TQM does have a significantly positive effect on organizational performance. Increased competition has motivated many senior managers in manufacturing organizations to evaluate their competitive strategies and management practices with the aim of improving organizational performance, MileÅ Terziovski et al (1999) Summary of the previous studies that examined the model to measure performance.

Authors	Proposed TQM model to measure Performance	Parameter taken	Remarks
Sluti (1992)	Structural equation modeling	To tests the relationship between quality practice and organizational performance.	Quality was found to have mixed results when related to organizational performance.
Powell (1995)		Studies on the relationship between TQM practice and firm performance. The study examines TQM as a potential source of sustainable competitive advantage.	The findings suggest that most features generally associated with TQM, such as quality training, process improvement, and benchmarking, do not generally produce advantage, but that certain tacit, behavioral, imperfectly imitable features can produce advantage.
Choi & Eboch (1998)		Investigated the impact of TQM on plant performance	
Lee (2002)	Developed a generic model for assessing, implementing and sustaining business excellence through structured approach in implementing best practices in TQM (such as in operations, quality, customer satisfaction, and, etc.) found in the Singapore Quality Award.	The model consists of four major elements. They are core values, goals, approaches and deployment and business excellence.	It starts by identifying a set of core values and its goals, and followed by a systematic implementation of initiatives based on the PDCA cycle. The model provides a guiding Structure for organizations to systematically implement an effective TQM program that targets a specific purpose.
Arawati Agus (2001)	In this study, a linear structural model was developed to investigate the relationships between TQM, competitive advantage (CA), customer satisfaction (CS) and financial performance (FP).	Competitive advantage (CA), customer satisfaction (CS) and financial performance (FP).	The findings indicate that training and top management commitment play very important roles in TQM implementations.
Daniel I. Prajogo, (2005)	Structural equation modelling (SEM) technique	Leadership, strategy and planning, customer focus, information and analysis, people management, and process management.	This study has shown that TQM construct based on the Malcolm Baldrige National Quality Award (MBNQA) criteria is valid across both manufacturing and service sectors, and its relationship with quality performance also indicates insignificant difference between the two sectors.
Arawati Agus & Za'faran Hassan (2011)	Pearson's correlation and structural equation modeling (SEM)	Supplier Relations, Benchmarking, Quality Measurement, and continuous Process Improvement	The findings suggest that TQM and its adoptions have significant correlations with production performance and customer-related performance.

One of the most complete empirical studies that tests the relationship between quality practice and organizational performance is that by Sluti (1992). The author applied structural equation modeling to study 184 manufacturing firms in New Zealand. Quality was found to have mixed results when related to organizational performance. Another most rigorous studies on the relationship between TQM practice and firm performance is by Powell (1995). The study examines TQM as a potential source of sustainable competitive advantage. The findings suggest that most features generally associated with

TQM, such as quality training, process improvement, and benchmarking, do not generally produce advantage, but that certain tacit, behavioral, imperfectly imitable features can produce advantage. The author concludes that these tacit resources, and not TQM tools and techniques, drive TQM success, and that organizations that acquire them can outperform competitors with or without TQM. Samson and Terziovski (1999) attempted to find the relationships between the various TQM practices, individually and collectively, and company performance. The results

showed that the intensity of TQM practice does contribute significantly to the performance. In another investigation, Terziovski and Samson (1999) tested the relationship between TQM practice and organizational performance with and without the covariates, company size, industry type and ISO 9000 certification status. The authors concluded that there were significant differences in the relationship between TQM and organizational performance across industry type and size, especially on the effect of defect rates, warranty costs and innovation of new products.

Arawati Agus (2001) In his study has described an empirical examination of the relations among customer satisfaction manifest indicators. The study proposes and elaborates a model that examines TQM practices in relation to three other constructs, namely competitive advantage, customer satisfaction and financial performance.

In the another study by Arawati Agus et al (2011) suggest that TQM would be able to support and accentuate production performance as well as increase the level of customer-related performance. TQM would no doubt enhance the processes of producing value added products. The results of the study validate the key linkages regarding the relationships between TQM, production performance and customer-related performance. Common challenges associated with the Performance Measurement approach.

The performance measurement revolution has seen a move away from the problems of past measurement systems. Five common features of outdated performance measurements systems were:

- Dominant financial or other backward-looking indicators
- Failure to measure all the factors that create value
- Little account taken of asset creation and growth
- Poor measurement of innovation, learning and change
- A concentration on immediate rather than long-term goals

The focus in performance measurement is now on achieving a balanced framework that addresses the issues described above. Examples of these new frameworks are Kaplan and Norton's Balanced Scorecard, Skandia's navigator model and the Performance Prism. Others recommend that the results sections of business excellence models should be used to generate a balanced set of performance measures.

There are a number of challenges that are faced when designing an effective Performance Measurement System, these include the following

- How to measure non-financial performance
- What measures to choose and why
- How to use them - what to do with the results
- Who should be responsible for using the results
- How and to whom, to communicate the results

The resources needed to consider the above and design and deploy the measurement system.

There are other major requirements that an organization needs to consider before an effective performance measurement system can be designed or installed. Apart from lower level measures that may be vital for the operation of processes, all measures need to be chosen to support the attainment of specific performance or behaviour identified by the organisation's leaders as important or necessary to work

towards the organizational goals. This being the case, there must be clearly defined goals/objectives and strategies chosen to reach them before measures can be chosen to support their attainment. Similarly the key processes, drivers of performance, and the core competencies required by employees need to be identified before effective performance measurement can be achieved.

5. Measuring Performance for Quality Improvement

Traditionally quality has been defined in terms of conformance to specification and hence quality-based measures of performance have focused on issues such as the number of defects produced and the cost of quality. Feigenbaum (1961) was the first to suggest that the true cost of quality is a function of the prevention, appraisal and failure costs. Campanella and Corcoran (1983) offer the following as definitions of these three types of cost:

Prevention costs are those costs expended in an effort to prevent discrepancies, such as the costs of quality planning, supplier quality surveys, and training programs.

Appraisal costs are those costs expended in the evaluation of product quality and in the detection of discrepancies, such as the costs of inspection, test, and calibration control;

Failure costs are those costs expended as a result of discrepancies, and are usually divided into two types:

- Internal failure costs are costs resulting from discrepancies found prior to delivery of the product to the customer, such as the costs of rework, scrap, and material review;
- External failure costs are costs resulting from discrepancies found after delivery of the product to the customer, such as the costs associated with the processing of customer complaints, customer returns, field services, and warranties.

Crosby's assertion (1923) that "quality is free" is based on the assumption that, for most firms, an increase in prevention costs will be more than offset by a decrease in failure costs. Basically, the logic underlying the cost of quality

6. Frame Work for Performance measurement

Steps in development of an effective performance measurement system

1. The performance measurement system must be integrated with the overall strategy of the business.
2. There must be a system of regular feedback and review of actual results against the original plan and the performance measures themselves.
3. The performance measurement system must be comprehensive. It needs to include the range of factors that contribute to the organization's success such as competitive performance, quality of service and innovation. This requires a range of financial and non-financial indicators.
4. The system must be owned and supported throughout the organization. The implementation must be top-down so that individuals setting strategy can determine the objectives and develop appropriate top-level measures.

These should filter down to the rest of the organization. Other levels throughout the organization should set their own measures in consultation with the level above and these must be consistent with the top-level measures.

5. Measures need to be fair and achievable. Where performance measures are used to reward managers' performance, the evaluation should include only the elements they have direct control over.
6. The system and results reporting need to be simple, clear and understandable, particularly to non-finance professionals. There is a need to priorities and focus so that only the key performance indicators for the business in strategic terms are measured.

Measuring performance comprises measuring the actual performance outcomes or results of an organization against its intended goals. This requires a top-down approach to setting performance criteria rather than a bottom-up approach that often occurring in many organizations. The strategic plan provides performance targets for the organization; it sets the corporate direction. Yet how often does the strategic plan set performance measurement target for all levels of the organization? The answer is, not often. As a result, performance improvement opportunities to support delivery of the organization's strategy get overlooked and the organization's progress is stymied.

Here are four opportunities for top leaders of the organization to identify and increase their organization's effectiveness when measuring organizational performance.

6.1 Identify the Strategic Measurements Right Down to Departmental Level

It is always a challenge to determine what to measure and of course how to measure it. In many organizations it is found that one department will determine what they should measure (For example, average hours an employee works each week) and another department will determine that these are not important areas to measure; they may determine that measuring an employee's output or extent to which their work performance is met, to be of greater importance. As a result, the organization misses out on getting an overall performance measurement with performance improvement opportunities. The senior leadership team creates the strategic plan. The departmental heads cascade this plan to their employees. This communication may include how the strategy's success will be measured, but usually, this is at too high a level, resulting in each department interpreting this information and creating their own systems of measurement. As a result of creating department level performance measurements to achieve the overall strategic plan the organization was able to realize its overall measurements for success.

6.2 Simplify Performance Measures

Organizations that successfully measure their performance achieve superior results. Conversely, organizations that over complicate their performance measures find it more difficult to measurably know the extent to which they've realized their goals. Keep to the essentials and keep in mind that

performance measures must be defined for each level of performance accountability.

6.3 Measure the Right Things

Performance outcomes are more important measures of work than output. They are the measurements of work performed that makes a difference to the organization and is in keeping with achieving the strategic organizational and departmental objectives. This work performed will be the key business processes. Establish criteria to determine the *key business processes*.

6.4 Eliminate "Silo" Thinking

While dividing organizations into departments may have some advantages, it can also be highly divisive and can prevent organizations from realizing performance synergies and collaboration. This is evident when directors, departments, managers, teams or staff may be high performers individually, but fail to choreograph their activities to create peak performance for the organization. Some pervasive drivers of "silo" thinking are competition among functional and structural groups over resources such as: money, budget, credit, equipment and workforce.

To reduce the impact of "silo" thinking it is important to allow data and information to flow across the organization and reduce competition for resources through prioritization of initiatives in accordance with the organization's strategic direction and planning. But when cross-functional problems occur, it is important to make efforts to successfully tackle them through collaborative problem solving. Put simply, nothing drives people back into their silos more quickly and effectively than unresolved problems, and conversely, nothing brings people out of their silos more quickly and effectively than tackling problems together as a collaborative group.

6.5 Measuring Organization's Performance

Create strategic performance measures, communicate these through all departments, identify the key business processes, eliminate a "silo" approach to measurement and measure the right things. There are certainly other opportunities for leaders but we wanted to present with some clear, concise, high impact opportunities that one can implement immediately.

6. Conclusions & Recommendations

It is best to acknowledge that performance measures should not be relied on exclusively for control. A performance measure may give a short-term measure which does not relate directly to actions which are taking place in order to lead to an improved longer-term level of performance. To some extent it should be acknowledged that improved performance may be achieved through the informal interaction of individuals and groups. One should acknowledge that imperfections will exist in any performance measurement scheme. George Brown (1998) has outlined a number of actions that may be taken in order to minimize the impact of imperfections which may

exist. People are involved in the achievement of the performance measures at all levels, and in all aspects, of an organization. It is important that all staff are willing to accept and work towards any performance measures which are developed to monitor their part in the operation of the organization and in the achievement of its objectives. Management will encourage employees to achieve organizational goals by having rewards linked to their success or failure in achieving desired levels of performance. It is critical that management establish an appropriate performance-rewards linkage. It is worth noting that performance measurement is a requirement for benchmarking and business excellence.

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