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Total quality management

Part 2. Guide to quality improvement methods

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Foreword

This Part of BS 7850 has been prepared under the direction of the Quality, Management and Statistics Standards Policy Committee. BS 7850 is published in two Parts as follows.

Part 1 *Guide to management principles*

Part 2 *Guide to quality improvement methods*

Total quality management assures maximum effectiveness and efficiency within an organization by putting in place processes and systems which will ensure that every aspect of its activity is aligned to satisfy customer needs and all other objectives without waste of effort and using the full potential of every person in the organization.

This philosophy recognizes that customer satisfaction, health, safety, environmental considerations and business objectives are mutually dependent. It is applicable within any organization.

Investment in material things is an accepted and well developed management practice but the application of total quality management primarily involves investment in time and people: time to train people; time to implement new concepts; time for people to recognize the benefits; and time for people to move forward into new and different company cultures. Every organization has to give these commitments if total quality management is to succeed.

This Part of BS 7850 gives guidance on implementing continuous quality improvement within an organization.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Guide

0 Introduction

When implementing total quality (see BS 7850 : Part 1), the management of an organization should ensure that the system will facilitate and promote continuous quality improvement. The constant goal of management of all functions and at all levels of an organization is to strive for quality and its improvement in a balanced way.

The motivation for quality improvement comes from conscious awareness shared by all members of an organization that every process can be done more effectively, giving increased value and satisfaction to customers, and more efficiently, with less waste and resource consumption.

These increases in effectiveness and efficiency benefit customers, the organization and its members, and society in general. Continuous quality improvement fundamentally affects the ability of an organization to compete and the ability of its members to contribute, grow, and excel.

1 Scope

This Part of BS 7850 gives guidance on implementing continuous quality improvement within an organization. The methods of adopting and implementing these guidelines depend upon factors such as the culture, nature, and size of an organization, the types of products or services offered, and the markets and customer needs served.

2 References

2.1 Normative references

This Part of BS 7850 incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on the inside back cover. Subsequent amendments to, or revisions of, any of these publications apply to this Part of BS 7850 only when incorporated in it by updating or revision.

2.2 Informative references

This Part of BS 7850 refers to other publications that provide information or guidance. Editions of these publications correct at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Definitions

For the purposes of this Part of BS 7850 the definitions given in BS 4778 apply together with the following.

3.1 process

Any activity that accepts inputs, adds values to these inputs for customers, and produces outputs for these customers. The customers may be internal or external to the organization.

NOTE 1. Every activity within an organization comprises one or more processes.

NOTE 2. Inputs, controls and resources are all supplied to the process.

3.2 quality improvement

Actions taken throughout the organization to increase the effectiveness and efficiency of activities and processes to provide added benefits to both the organization and its customers.

3.3 quality losses

Losses caused by failure to utilize most effectively and efficiently the potential of human, financial, and material resources in a process.

NOTE. Some examples of quality losses are the loss of customer satisfaction, loss of opportunity to add more value to the customer, the organization, and society, as well as waste of resources, loss due to injury, occupational ill health, property damage or process interruption. Quality costs are a subset of quality losses (see 4.3).

3.4 corrective action

Action taken to eliminate the causes of an existing nonconformity, or other undesirable situation to prevent recurrence.

NOTE 1. The actions may involve changes such as in procedures and systems to achieve quality improvement at any stage of the quality loop.

NOTE 2. There is a distinction between correction and corrective action. Correction refers to repair rework or adjustment and relates to the disposition of an existing nonconformity. Corrective action refers to the elimination of the cause of a nonconformity.

NOTE 3. Sorting and reworking are examples of corrective action.

3.5 preventive action

Action taken to eliminate the causes of a potential nonconformity, or other undesirable situation, in order to prevent occurrence.

NOTE 1. The actions may involve changes such as in procedures and systems to achieve quality improvement at any stage of the quality loop.

NOTE 2. Quality improvement is achieved through preventive action.

4 Fundamental concepts

4.1 Principles of quality improvement

The quality of an organization's products, services, and other outputs is defined by the satisfaction of the customers who use them and is determined by the effectiveness and efficiency of the processes by which they are created and supported. Quality improvement is achieved by improving the processes of an organization; it should be a continuous activity, aiming for ever higher levels of process effectiveness and efficiency; efforts should be directed towards constantly seeking opportunities for improvements, rather than only waiting for a problem to reveal an opportunity.

Corrective action eliminates a problem which has occurred. Preventive action eliminates or minimizes the cause of the problem, and hence any future occurrence. Thus, preventive action improves the processes of an organization and is essential for quality improvement.

4.2 Environment for quality improvement

4.2.1 Management responsibility and leadership

The responsibility and leadership for creating the environment for continuous quality improvement belongs to the highest level of management. Only by their actions, constancy, and dedication of resources do managers convey the leadership and commitment necessary for creating the environment for quality improvement. Managers lead quality improvement by communicating purpose and goals, by continuously improving their own work processes, by fostering an environment of open communication, teamwork, and respect for the individual, and by enabling and empowering everyone in the organization to improve their work processes.

4.2.2 Values, attitudes, and behaviours

The environment for quality improvement often requires the development of a new set of shared values, attitudes, behaviours and setting ever more challenging goals for doing this as efficiently as possible. Values, attitudes, and behaviours that are essential for continuous quality improvement include the following.

- a) Attention should be focused on satisfying the needs of both internal and external customers.
- b) The entire supply chain from suppliers to customers should be included in quality improvement.
- c) Management commitment, leadership, and involvement are critical to continuously improve processes.
- d) Continuous quality improvement is a part of everyone's job.
- e) All processes can be continuously improved.
- f) Failures and defects are addressed by improving the process and the systems within which it operates.
- g) An environment of open communication, teamwork, and respect for the individual should be created and maintained.
- h) Ongoing education and training are essential for everyone.

4.2.3 Quality improvement goals

Quality improvement goals should be established and defined with care. They should be closely integrated with the overall business goals and provide focus for increasing customer satisfaction and process efficiency. They should be clearly understandable, challenging, pertinent, and agreed to by all who work together to achieve them.

4.2.4 Communication and teamwork

Open communication and teamwork remove organizational and personal barriers that interfere with effectiveness, efficiency, and continuous improvement of work processes; they should be extended throughout the whole supply chain including suppliers and customers. Communication and teamwork require trust. This is essential if everyone is to be involved in identifying and following up opportunities for improvement.

4.2.5 Recognition

The recognition process should be consistent with the values, attitudes, and behaviours necessary for quality improvement (see 4.2.2).

Successful recognition processes allow the development and growth of individuals, including the factors which influence the individual's work performance (e.g. opportunity, organization, environment). Successful recognition processes also allow group performance and group recognition, and give rise to frequent and informal feedback.

NOTE. Reward systems should be consistent with the recognition process. In particular, it is essential that reward systems do not encourage destructive internal competition.

4.2.6 Education and training

Education and training programmes are important in creating and maintaining an environment for quality improvement. All members of an organization, including the highest levels of management, should be educated and trained in quality principles and practices and in the application of appropriate methods for quality improvement. This includes the use of quality improvement tools and techniques (see annex A). All education and training programmes should be reviewed for consistency with the quality principles and practices of the organization.

4.3 Quality losses

Opportunities to reduce quality losses, guide quality improvement efforts. Quality losses should be linked to the processes causing them. Some important quality losses such as the loss of customer goodwill and the failure to fully utilize human potential are difficult to measure. It may be necessary to recognize the existence of these intangible quality losses without quantifying them.

5 Managing for quality improvement

5.1 General

Although the application of any of the techniques described in annex A will give some incremental improvement, their full potential can only be realized if they are applied and coordinated within a structured framework. This requires organizing, planning, and measuring for quality improvement.

5.2 Organizing for quality improvement

5.2.1 An effective organization for quality improvement identifies opportunities for quality improvement both vertically within the organizational hierarchy and horizontally in the processes that flow across organizational boundaries.

5.2.2 Within the organizational hierarchy responsibilities for quality improvement include the following:

- a) management processes of the organization such as defining the mission of the organization, clarifying roles and responsibilities, acquiring and assigning resources, providing education and training, strategic planning, and recognition;
- b) work processes of the organization;
- c) measurement and tracking of the reduction of quality losses;
- d) administrative support processes such as secretarial, budgeting and purchasing;
- e) building and maintenance of an environment that empowers, enables, and charges all members of the organization to continuously improve quality.

5.2.3 Within the processes that flow across organizational boundaries, responsibilities for quality improvement include the following:

- a) defining and agreeing the purpose of each process and its relationship with the objectives of the organization;
- b) establishing and maintaining communication among departments;
- c) identifying both internal and external customers of the process and determining their needs and expectations;
- d) identifying suppliers to the process and communicating to them their customer needs and expectations;
- e) searching for process improvement opportunities, allocating resources for improvement and overseeing implementation of these improvements.

5.2.4 An organization for quality improvement should address the following methods:

- a) providing policy, strategy, major quality improvement goals, overall guidance, support, and broad coordination of the organization's quality improvement activities;
- b) identifying cross-functional quality improvement needs and goals and assigning resources to pursue them;
- c) pursuit of quality improvement goals by team projects within their areas of direct responsibilities and authorities;
- d) encouraging every member of the organization to pursue quality improvement activities related to their work and for coordinating these activities.

5.3 Planning for quality improvement

5.3.1 Management should set quality improvement goals for reducing quality losses. Plans should be developed within the business planning cycle to provide strategic guidance and direction for meeting these quality improvement goals and for implementing quality policy. These plans should address the most important quality losses and should be deployed throughout all functions and all levels of the organization.

5.3.2 The development of quality improvement plans should involve everyone in the organization along with the supplier(s) and customer(s) of the organization.

5.3.3 Quality improvement plans are often implemented through a set of specific quality improvement projects or activities. Management should take care to monitor and control such implementation activities to ensure their integration into the overall goals and business plans of the organization.

5.3.4 Plans for quality improvement focus on newly identified opportunities and on areas where insufficient progress has been made. The planning process has inputs from all levels of the organization, from reviews of achieved results, and from customers and suppliers.

5.4 Measuring quality improvement

5.4.1 An organization should develop a measurement system that fits the nature of its operations. A system of objective, data-based measurements should be established for monitoring the results of quality improvement activities. A well developed system includes measurements at unit, department, and cross-functional levels. The measurements should relate to quality losses associated with customer satisfaction, process efficiencies, and losses sustained by society as follows.

- a) Measures of quality losses associated with customer satisfaction may be based on information from surveys of current and potential customers, surveys of competing products and services, changes in revenues, routine inspections by service personnel, information from sales and service staff, and customer complaints and claims.
- b) Measures of quality losses associated with process efficiency may be based on labour, capital, and material utilization, producing, sorting, correcting, or scrapping unsatisfactory process output, process readjustments, waiting times, cycle times, delivery performance, unnecessarily redundant designs, size of inventories, and statistical measures of process capability and process stability.
- c) Measures of quality losses sustained by society may be based on failure to realize human potential (e.g. as indicated by employee satisfaction surveys), damage caused by pollution and disposal of waste, and depletion of scarce resources.

5.4.2 The phenomenon of variability is common to all measurements. Trends displayed by measurements should be interpreted statistically.

5.4.3 Measuring and tracking trends from a base line of past performance are important, in addition to establishing and meeting numerically given targets.

5.4.4 The measurements should be reported and reviewed as an integral part of the management accounting and control practices of the organization.

NOTE. The cost of measurement, if significant, may become a feature in the ultimate effectiveness of the improvement.

6 A methodology for quality improvement

6.1 Involving the whole organization

When an organization is well motivated and managed for quality improvement, a number of quality improvement projects or activities of varied complexity will be continuously undertaken and implemented by all members and levels of the organization. Quality improvement projects and activities will vary from those necessitating cross-functional or management teams to those which will be selected and implemented by either individual members or teams.

Quality improvement benefits will accumulate steadily when an organization pursues quality improvement projects and activities in a consistent, disciplined series of steps based on data collection and analysis. A quality improvement project or activity usually starts with the recognition of an improvement opportunity. This recognition can be based on measures of quality losses and/or on competitive comparisons (benchmarks) against organizations recognized as leaders in a particular field. Once defined, the quality improvement project or activity progresses through a series of steps and is completed with the implementation of actions taken on the process to reach and maintain the new, improved level of performance. As quality improvement projects or activities are completed, new quality improvement projects or activities are selected and implemented.

6.2 Initiating quality improvement projects or activities

The need, scope and importance of a quality improvement project or activity should be clearly defined and demonstrated. The definition should include the relevant background and history, the associated quality losses, and the current status, if possible, expressed in specific, numerical terms. A person or a team, including the team leader, should be assigned to the work. It is necessary to establish a schedule and allocate adequate resources. Provision should be made for periodic reviews of scope, schedule, and resource allocation.

6.3 Investigating possible areas for improvement

The purpose of this step is to increase the understanding of the nature of the process to be improved by collection and validation of data. It is important to carry out this step with the utmost objectivity, without any preconceptions of what the causes or preventive measures might be.

6.4 Establishing cause and effect relationships

The data are analysed to gain insight into the nature of the process to be improved and to formulate possible cause and effect relationships. The relationships that appear to have a high degree of consistency with the data need to be tested, based on further data collection. New data have to be collected according to a carefully constructed plan to confirm these relationships.

6.5 Taking improvement action

After cause and effect relationships are established, alternative proposals for improvement action to address the causes should be developed and evaluated. Advantages and disadvantages of each proposal should be examined by the members of the organization who will be involved in implementing the improvement action. Successful implementation depends on the cooperation of all those involved.

NOTE. Quality improvements are secured by improvement actions on the process so that more satisfactory outcomes occur and/or unsatisfactory outcomes no longer occur or their frequency is substantially reduced. Relying solely on corrective actions on process outcomes such as repairing, reworking, or sorting perpetuates quality losses.

6.6 Confirming the improvement

After implementing improvement action, appropriate data should be collected and analysed to confirm that an improvement has been made. The data should be collected on the same basis as that prior to implementation. Investigations also need to be made for side effects, either desirable or undesirable, that may have been introduced.

If after taking action undesirable results continue to occur, it will be necessary to redefine the quality improvement project or activity by returning to the initiation step.

6.7 Sustaining the gains

After the quality improvement has been confirmed, it needs to be sustained. This usually involves a change of specifications and/or operating or administrative procedures and practices, necessary education and training, and making sure that these changes become an integral part of the job content of everyone concerned. The improved process then needs to be controlled at the new level of performance.