

TECHNICAL REPORT

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Guidelines for managing the economics of quality

*Lignes directrices pour le management des effets économiques
de la qualité*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The main task of technical committees is to prepare International Standards, but in exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard (“state of the art”, for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/TR 10014, which is a Technical Report of type 2, was prepared by Technical Committee ISO/TC 176, *Quality management and quality assurance*, Subcommittee SC 3, *Supporting technologies*.

This document is being issued in the Technical Report (type 2) series of publications (according to subclause G.3.2.2 of part 1 of the ISO/IEC Directives, 1995) as a “prospective standard for provisional application” in the field of the economics of quality because there is an urgent need for guidance on how standards in this field should be used to meet an identified need.

This document is not to be regarded as an “International Standard”. It is proposed for provisional application so that information and experience of its use in practice may be gathered. Comments on the content of this document should be sent to the ISO Central Secretariat.

A review of this Technical Report (type 2) will be carried out not later than three years after its publication with the options of: extension for another three years; conversion into an International Standard; or withdrawal.

Annex A of this Technical Report is for information only.

Introduction

This Technical Report presents concepts and a methodology which give organizations the opportunity to increase customer satisfaction and, at the same time, reduce costs. It also assists the organization in determining which of the techniques for the classification of costs and monitoring of customer satisfaction best meet their needs.

Quality management influences the economic performance of an organization both in the short and long term. The organization should not view these effects only in the form of cost reductions in the short term. What appears to be an improvement in the short term may have negative long-term effects on customer loyalty, product reputation or user confidence.

The short- and long-term economic goals should be formulated and regularly reviewed in quality planning.

Guidelines for managing the economics of quality

1 Scope

This Technical Report provides guidance on how to achieve economic benefits from the application of quality management.

It should be applied broadly to all organizations and at all levels within an organization. It is not intended to be used in contractual situations nor as a subject for third-party audits.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this Technical Report. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this Technical Report are encouraged to investigate the possibility of applying the most recent edition of the standard listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8402:1994, *Quality management and quality assurance — Vocabulary*.

3 Definitions

For the purposes of this Technical Report, the definitions given in ISO 8402 and the following definitions apply.

3.1

cost of conformity

cost to fulfil all of the stated and implied needs of customers in the absence of failure of the existing process

3.2

cost of nonconformity

cost incurred due to failure of the existing process

4 Primary purpose of an organization

The organization's management should define and document its primary purpose, its quality policy and quality objectives. It is then possible to plan value-adding and cost-reducing activities to maximize the economic effect.

EXAMPLES

A fire department would have the protection of the public from loss due to fire as its primary purpose.

A retailer may have the generation of profits as its primary purpose.

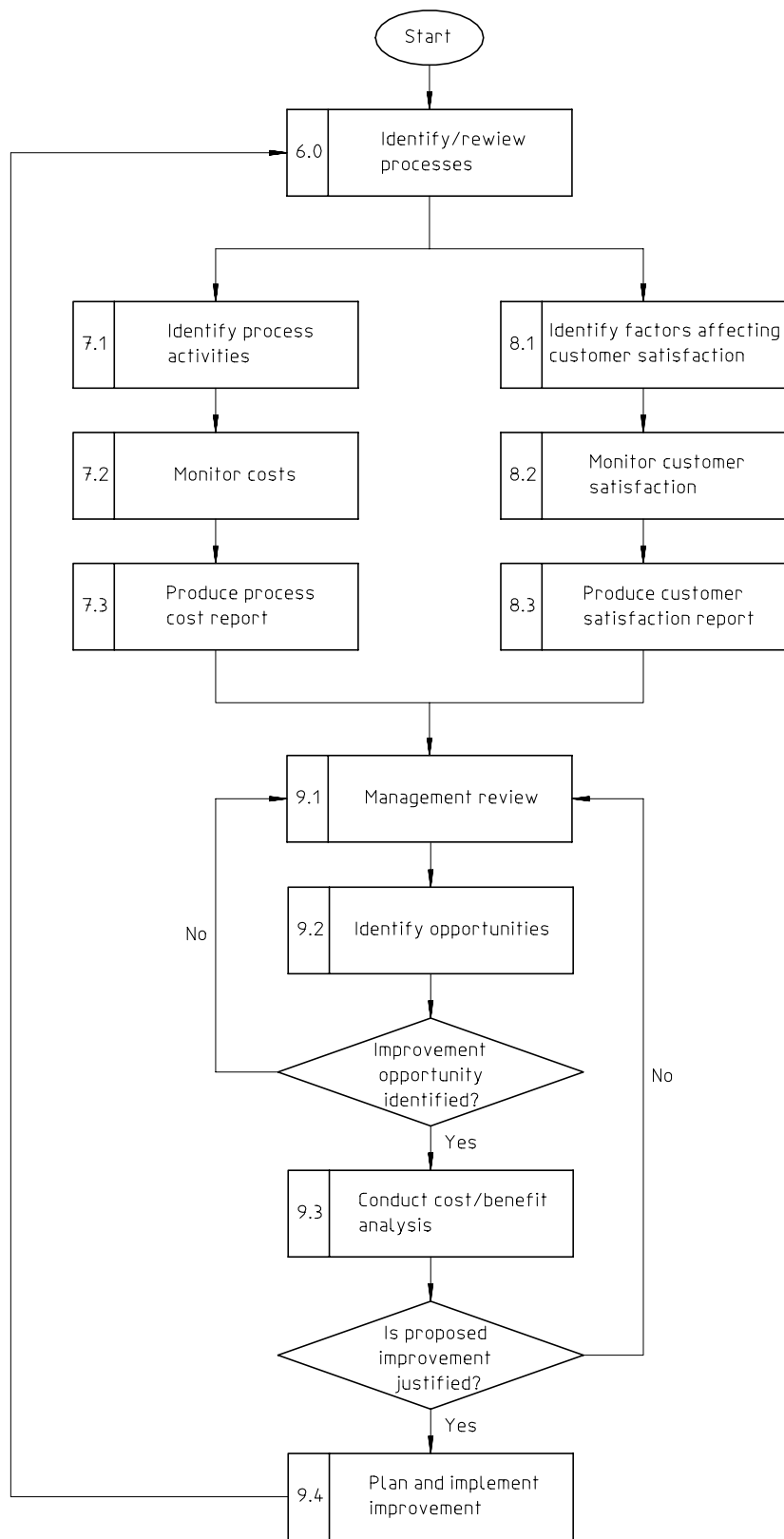


Figure 1 — Methodology for managing the economics of quality

5 Managing the economics of quality

The organization should achieve its primary purpose while continually improving its performance by using a methodology for managing the economics of quality as shown in figure 1.

NOTE The numbers in figure 1 correlate to the clause numbers of this Technical Report.

The methodology starts with the identification or the review of the organization's processes. This enables the activities and associated costs to be identified, monitored and reported. It also enables the organization to identify, monitor and report the level of customer satisfaction. These two reports can then be used in the management review to identify opportunities to improve processes and customer satisfaction.

Management should perform cost benefit analysis to determine if action is required and if the proposed improvement action is justified, taking into account the short- and long-term benefits.

If the action is approved, the organization should plan and implement the improvement and monitor the results to give feedback to the process.

The organization should repeat this methodology for continuous improvement.

6 Identify/review processes

Management should apply the concepts in this Technical Report to the organization as a whole. In this case the customers will be external to the organization. Management should also apply the concepts to selected processes within the organization. In these cases the customers may be both internal and external to the organization.

The organization should ensure that processes are directed towards the fulfilment of customer needs. Processes comprise a set of interrelated resources and activities which transform inputs into outputs. The economic performance of a process should be measured using indicators of costs and customer satisfaction.

The organization should identify the key processes in terms of their impact on cost and customer satisfaction. An organization should specify the roles and responsibilities of those who manage these processes.

7 Organization's view

7.1 Identify process activities

The organization should identify the activities within a process to enable costs to be allocated. This can be accomplished by developing a flowchart that shows all the process activities in their logical order. The inputs to process activities (such as materials, equipment and data) should be identified. The outputs from process activities should be identified and each output should be recognized as going to one or more customer.

The controls and resources of all processes should also be identified.

7.2 Monitor costs

The organization should identify and monitor the costs associated with each activity of the selected processes. Costs could include direct and indirect labour, materials, equipment, overheads, etc. Cost data can be actual, allocated or estimated.

Cost data can be extracted from the existing financial control system, complemented by operational data collection. Data extracted from other sources can be quantified and maintained by the organization. Costs that cannot be readily associated with specific cost elements should be estimated. If such costs are significant, appropriate records should be established. The objective is to allocate costs and not to absorb such costs into overheads. Costs should not be restricted to operational activities only but should encompass all activities of the organization.

There are currently in use several approaches to the classification of costs which include:

- a model where costs are grouped under the headings "Prevention, Appraisal and Failure" (known as the PAF model);
- a model where the costs are grouped under the headings of costs of conformity and costs of nonconformity (known as the process model);
- a model where the costs are grouped under the different phases of the life cycle of the product (known as the Life-Cycle Model);
- a model that focuses on identifying and measuring added-value defects in the trading account resulting from badly designed or badly performed activities.

The choice of model will depend on the organization's own requirements.

7.3 Produce process cost report

The organization should summarize the costs and compare them with an appropriate measurement base, such as net sales, cost input or direct labour. This comparison will relate the economics of quality to the amount of activity performed. Costs may be reported by company, division, facility or department, based on the individual needs of the organization. The amount of detail in the report should depend on the level of management for which the report is intended. Top management may require an abbreviated report whilst line managers would require detailed cost information. Charts may be used to present data and trends in the system.

8 Customers' views

8.1 Identify factors affecting customer satisfaction

Customer satisfaction can be monitored on a scale from complete dissatisfaction to delight. Customers will experience a certain level of satisfaction for a given set of circumstances. This will be influenced by three sets of factors: those which cause dissatisfaction, satisfaction and delight.

Customer satisfaction cannot be predicted with precision but should be monitored to detect opportunities for improvement. During quality planning, the organization should give consideration to these factors.

While customer satisfaction is a good thing, the decisive factor in the economics of quality is "customer loyalty". Customers may be satisfied and still not re-purchase. Ongoing economic benefit is achieved through customer satisfaction, demonstrated by customer loyalty.

8.1.1 Factors causing dissatisfaction

Factors causing dissatisfaction may be ineffective processes or undesirable product features. When they are present, customer satisfaction decreases significantly. If no such factors are present, customer satisfaction is not improved; it simply does not deteriorate. These factors are considered much more significant by the customer than the organization may realise.

EXAMPLES

Defective products or services, delivery problems, problems in obtaining service, uncooperative staff, or indifference to complaints or customer questions.

8.1.2 Factors causing satisfaction

Factors causing satisfaction are expected processes or product features. As more of these factors are provided, customer satisfaction increases.

EXAMPLES

If the price of a product is reduced, it is better value and the customer is more satisfied.

The offer of a wider range of product styles, models, i.e. choices, are factors causing satisfaction.

Factors causing satisfaction do not necessarily compensate for factors causing dissatisfaction.

EXAMPLE

The low price paid for an item or fast delivery is quickly forgotten by the customer if the product was defective upon receipt.

8.1.3 Factors causing delight

Factors causing delight are processes or product features which were neither expected nor specified and are positively viewed by the customer when experienced.

EXAMPLES

Examples of hotels will illustrate these factors.

If travellers were to check-in to a hotel and find that the reservation had been lost, the room was dirty, and the air-conditioning was inoperative, they would be very dissatisfied.

If another hotel offers a reduced room rate and free transportation to the airport, these would increase satisfaction.

If the hotel staff knows the customer's name when checking in, the television has programmes in the customer's native language, and the customer finds a bowl of fruit in the room, these may be factors causing delight.

8.2 Monitor customer satisfaction

As customers' and organizations' needs are constantly changing, the organization should continuously monitor customer satisfaction to facilitate trend analysis.

Organizations exist to meet customer needs. In order to maintain customer loyalty, the organization needs to satisfy all customers' stated and implied needs.

In order to define the real customer satisfaction level, the organization should consider various data collection methods. An organization can identify customer satisfaction through quantitative or qualitative surveys. In quantitative surveys, data may be collected through interviews, questionnaires to be filled out by the customers, or through observation of customer behaviour. In qualitative surveys, the organization may go into more detail on the surveyed questions, extract customer perceptions, and become familiar with customer feelings. The organization should define the best data collection methods in accordance with the nature of the study, deadlines and available funds.

8.3 Produce customer satisfaction report

The organization should convert the results of the customer satisfaction monitoring effort to a format which can be evaluated for decision making. This customer satisfaction report should contain the results of the monitoring activities, the sources and methods used to collect the information, and an appraisal of the factors which are thought to have influenced the current level of customer satisfaction.

Comparisons to previous results, trends, industry norms or competitive information should be included, if available. Investigation of customer satisfaction levels with other industries may provide useful information for comparison with the organization's own results.

9 Manage the improvements

9.1 Management review

The organization should review the costs and customer satisfaction reports so that the reports are:

- reviewed at appropriate intervals by management;
- compared to the plans using the relevant data;
- analysed, taking into account the changing business environment.

The review should bring trends to the attention of management for action, after considering the effects on both long- and short-term plans.

9.2 Identify opportunities

The organization should analyse the information from the cost and customer satisfaction report to determine if there are opportunities for improvement in the areas of:

- correction of nonconformities;
- prevention of nonconformities;
- continuous improvement;
- totally new products or processes.

The objective and scope of the opportunities should be documented, and improvement actions should be implemented. The long-term plan should provide goals for improved value and should take into account the necessary resources.

The short-term plan for improvement should translate the long-term plan into measurable actions leading to an improved value. A tree diagram (see figure 2) can help in defining priorities.

9.3 Conduct cost/benefit analysis

The organization should consider the economic effects of all possible quality improvement actions. The benefit can then be compared to the proposed cost to assist prioritization and decision making. The improvement matrix in table 1 shows examples of possible effects of a range of quality improvement actions. The actual effects will depend on the unique circumstances of the organization.

In a 'for profit' situation, it may be possible to predict the increased revenue generated by customer loyalty as a result of a quality improvement action. It is difficult, if not impossible, to predict the extra revenue from new customers as a result of the recommendations of existing satisfied or delighted customers. However, this effect can have a major impact on the organization's financial performance.

In a 'not for profit' situation increasing customer satisfaction may or may not bring a direct financial benefit. This depends on the funding mechanisms for the organization. There will be an increase in the value to the customers, and other stakeholders, which is difficult to quantify in financial terms but is just as real.

EXAMPLE

A school implementing quality improvement actions will improve its reputation. As a result, more and more parents will wish to send their children. If the school's funding is calculated per child then its budget will increase as a result of the improvements. This assumes spare capacity within the school. If the funds are calculated by a different formula there may be no immediate financial benefit to the school even though the real benefit to society could be very large but impossible to quantify.

To conduct the cost/benefit analysis, the organization may go through the following steps:

- a) ensure that the proposed improvement action is clearly defined, planned and costed in line with the organization's primary purpose;
- b) predict the impact on customer satisfaction by increasing the factors causing delight and satisfaction, and reducing the factors causing dissatisfaction;
- c) estimate the increase in revenue due to repeat orders and new business as a result of improved customer satisfaction;
- d) identify the less tangible benefits to the customers and other stakeholders;
- e) estimate the changes in the costs of conformity and nonconformity, both internal and external to the process;
- f) collate the total financial impact of the proposed improvement action;
- g) compare the total benefits with the investment for the improvement action and decide whether to proceed or not.

The organization can use a variety of financial decision methods (e.g. net present value, pay-back time, internal rate of return) to decide whether to proceed or not.

A consideration is needed of the less tangible benefits. Some economic effects may be difficult to quantify, such as reference sales and productivity gains due to increases in morale, but they could be substantial. Both tangible and intangible benefits need to be considered in the decision process.

The decision to proceed should be made at a level which is appropriate. If the potential investment is low, the decision should be made in a flexible, unbureaucratic way by those closest to the process. If the investment is substantial, more formal decision processes may need to be followed. Caution is required to ensure maximum benefit from minimum investment.

9.4 Plan and implement improvement

The organization should plan and implement the approved improvement actions. The process cost and customer satisfaction report should be used to ensure that the predicted improvements are achieved. If they are not, more analysis may be required.

In accordance with the plan, the organization should review the results of the implementation of the improvement actions to ensure their effectiveness.

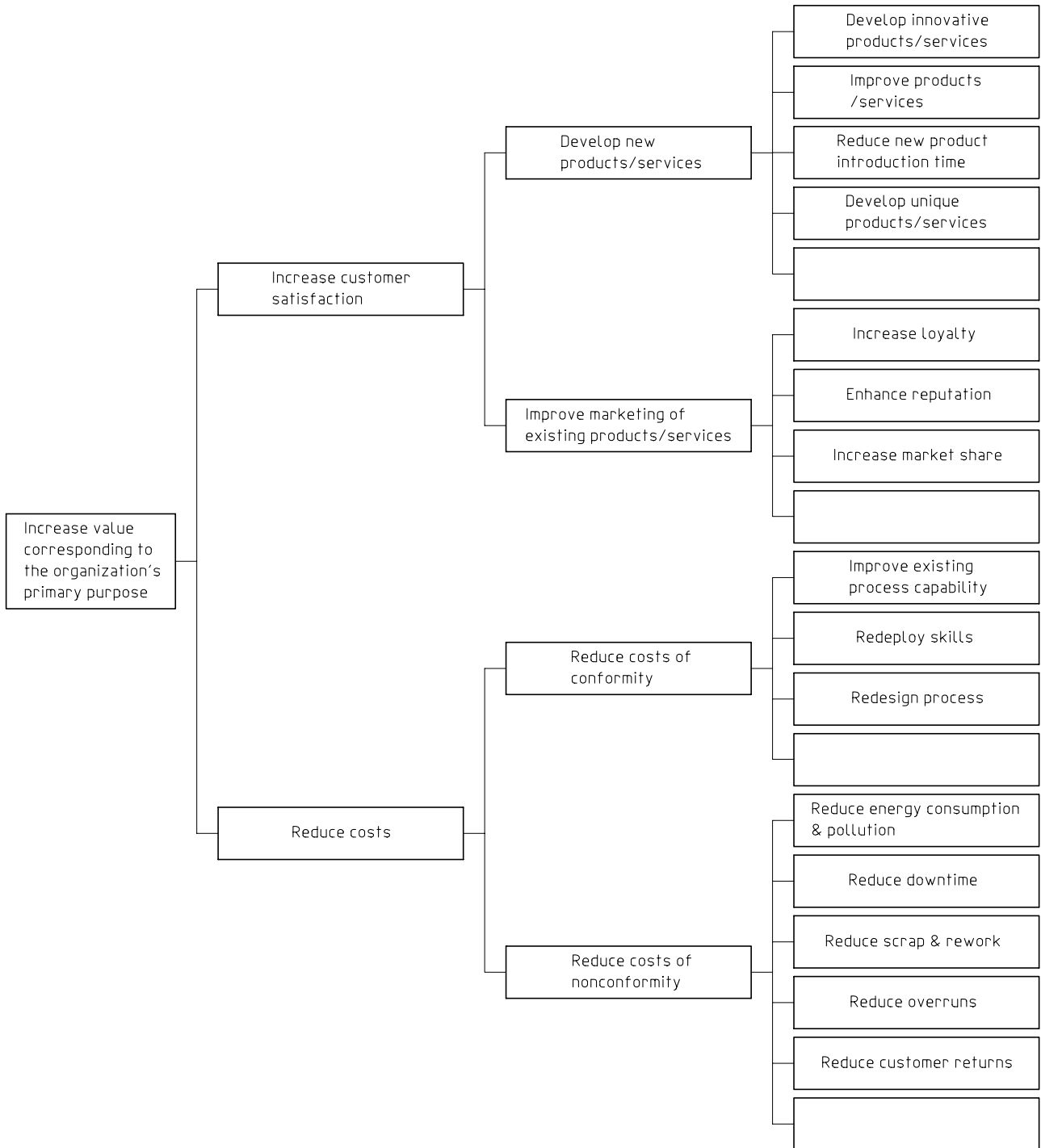


Figure 2 — Tree diagram of how to improve the economics of quality

Table 1 — Examples of possible effects of a range of quality improvement actions

Possible major effects			Examples of improvement actions							
			Reduce product defects	Develop innovative new products	Improve processes	Obtain ISO 9001, ISO 9002 or ISO 9003 certification	Deliver customer care training	Reduce environmental pollution		
Increase value corresponding to the organization's primary purpose	Increase overall customer satisfaction	Increase factors causing customer delight		X				X	X	
		Increase factors causing customer satisfaction		X		X	X	X		
		Decrease factors causing customer dissatisfaction	X				X	X		
	Decrease external and internal operating costs	Decrease costs of conformity			X					
		Decrease costs of nonconformity	X		X	X	X	X		

Key: **X** denotes probable strong effect.

NOTE Actual effects will depend on the unique circumstances of the organization.

Annex A

(informative)

Bibliography

- [1] ISO 9000-1:1994, *Quality management and quality assurance standards — Part 1: Guidelines for selection and use.*
- [2] ISO 9004-1:1994, *Quality management and quality system elements — Part 1: Guidelines.*
- [3] ISO 9004-4:1993, *Quality management and quality system elements — Part 4: Guidelines for quality improvement.*
- [4] IEC 60300-3-3:1996, *Dependability management — Part 3: Application guide — Section 3: Life cycle costing.*

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Descriptors: quality, quality assurance, quality management, economics, effectiveness, methodology, concepts, rules (instructions).

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