BRITISH STANDARD

BS 7000-3:
1994

Design management systems —

Part 3: Guide to managing service design

UDC 658.512.2.012.4:658.64

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Quality, Management and Statistics Standards Policy Committee (QMS/-) to Technical Committee QMS/41, upon which the following bodies were represented:

Association of Consulting Engineers
BEAMA Ltd.
British Quality Centre
British Photographic Association
British Standards Society
Cambridge University
Chartered Society of Designers
Consumers' Association
Defence Manufacturers' Association
Department of Trade and Industry
Department of Trade and Industry (Standards Policy Unit)
Design Council
Electricity Association
Energy Industries Council
Federation of Small Businesses
GAMBICA (BEAMA Ltd.)
Institute of Quality Assurance
Institution of Civil Engineers
Institution of Electrical Engineers
Institution of Engineering Designers
Institution of Mechanical Engineers
Medical Sterile Products Association
Ministry of Defence
NAFEMS
Red Oak Quality Services Ltd.
Royal Institute of British Architects
University of Westminster

This British Standard, having been prepared under the direction of the Quality, Management and Statistics Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 September 1994

The following BSI references relate to the work on this standard:
Committee reference QMS/41
Draft for comment 93/408648 DC

ISBN 0 580 23205 0

Amendments issued since publication

Amd. No.	Date	Comments

Contents

Foreword

This Part of BS 7000 has been prepared under the direction of the Quality, Management and Statistics Standards Policy Committee.

In October 1993, BS 7000 *Guide to managing product design* was renumbered BS 7000-1 to accommodate further Parts. It is intended that BS 7000 will comprise initially the following Parts.

— *Part 1: Guide to managing product design* (identical with BS 7000:1989);

— *Part 2: Guide to managing the design of manufactured products* (in preparation in Panel QMS/41/- /2);

— *Part 3: Guide to managing service design* (this Part);

— *Part 4: Guide to managing design in construction* (in preparation in Panel QMS/41/- /5);

— *Part 10: Glossary of terms used in design management* (in preparation in Panel QMS/41/- /1).

Other Parts may be added.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 22, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Introduction

Service design is the formative stage of a service. It should be used to meet the reasonable and foreseeable requirements of the potential users of the service whilst using the available resources with economy.

Services may be paid for directly by the recipient such as accountancy, banking or law. Other services may not be paid for directly, such as the civil service, social services, emergency services and charitable services.

The concepts, principles and quality system elements described are applicable to all forms of service, whether solely of a service character or in combination with the manufacture and supply of a tangible product. This can be shown as a continuum ranging from a situation where the service is directly related to a product to a situation where there is little product involved.

Figure 1 illustrates this concept for three types of service.

A poorly designed service may damage a company's reputation and prospects for growth, particularly if performed without due regard to customer expectations, safety and reliability. The benefits derived from the effective management of service design are therefore considered.

This Part of BS 7000 sets out the elements of the task for the following groups of people:

a) senior management;

b) project managers;

c) design managers and designers.

In a large organization the functions will probably be undertaken by different members of staff. In a small organization they may be undertaken by a single person, but are nevertheless distinct and different. All the staff concerned should be aware of their functions and it is recommended that they should understand the full content of this Part of BS 7000 while paying particular attention to the section that is most directly relevant to them.

This Part of BS 7000 provides guidance and it is not a specification. The recommendations and check-lists are believed to be generally applicable, but managers are advised to use the guidance given in accordance with the circumstances of their own operation.

The prerequisites for effective design management, in the context of this Part of BS 7000 and their own organization, are the following:

1) awareness of customers' interests and needs;

2) commitments to quality and reliability;

3) sincere and visible commitment to good design;

4) motivation of all staff involved;

5) a vision of the future and the provision of clear objectives;

6) provision of adequate resources in terms both of personnel and equipment;

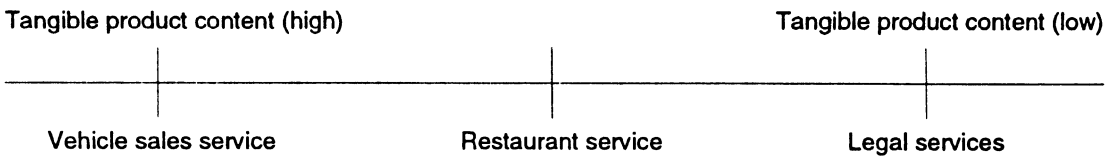
7) provision of organizational systems;

8) awareness of competitors;

9) awareness of relevant activity and innovation in other fields;

10) understanding organizational capabilities and limitations.

Whilst the design process is described as a series of sequential steps, opportunities for parallel development should be considered to reduce lead time to introduction of the service.



NOTE. Equipment or facilities may also be directly involved in providing a service, for example, vending machines or automatic banking machines.

Figure 1 — Product content in a service continuum

Section 1. General

1.1 Scope

This Part of BS 7000 gives guidance on the management of the design of service at all levels, for all design organizations and all types of service.

The service that is the subject of a design brief may be the complete service in its own right or a component of a larger service, e.g. an airline service or the catering service component.

Guidance is given only on the application of general management principles and techniques to the management of design. Discussion of the techniques themselves, e.g. management of people, time, and their application to areas other than design and the design process itself are excluded.

NOTE 1 Appropriate reference is made to other documents for guidance on general management techniques. A bibliography is given in annex C.
NOTE 2 Guidance on procedures required to meet statutory requirements, e.g. health and safety, or product and service liability, is not intended to be comprehensive and reference should be made to other documents where appropriate.

1.2 References

1.2.1 Normative references

This Part of BS 7000 incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on page 22. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this Part of BS 7000 only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

1.2.2 Informative references

This Part of BS 7000 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 page 22, but reference should be made to the latest editions.

1.3 Definitions

For the purposes of this Part of BS 7000 the definitions given in BS 7000-1:1989, BS 4778-1:1987, BS 4778-2:1991, BS 4778-3.1:1991 and BS 4778-3.2:1991 apply, together with the following.

1.3.1
conceptual design phase

preliminary research and design studies to establish design alternatives that merit further development

1.3.2
customer(s)

the intended recipient(s) of a product or service

NOTE See BS 3811.

1.3.3
design evaluation

systematic examination of the result of an activity to establish the degree to which the original objectives have been fulfilled

NOTE 1 The term is usually linked to a specific activity, e.g. system evaluation, project evaluation. Results are usually measured in terms of time, cost and achievement.
NOTE 2 Evaluation generally takes place at the end of an activity, but progress can be maintained by carrying out intermediate or stage evaluation, particularly where intermediate stage achievements have been planned.

1.3.4
product champion

person dedicated to the promotion and introduction of a new product, although not necessarily responsible for any aspect of the programme

1.3.5
service quality control specification

document that specifies the requirements for effective control of the service to ensure that it consistently satisfies the service specification and the customer requirements

1.3.6
service

results generated, by activities at the interface between the supplier and the customer and by supplier internal activities, to meet customer needs

NOTE 1 The supplier or the customer may be represented at the interface by personnel or equipment.
NOTE 2 Customer activities at the interface with the supplier may be essential to the service delivery.
NOTE 3 Service is intangible and as such cannot be stored.
NOTE 4 Delivery or use of tangible product may form part of the service delivery.
NOTE 5 A service may be linked with the manufacture and supply of tangible product.
NOTE 6 This definition is identical with that in BS 5750-8, with the exception of note 4.

1.3.7
service characteristics

features and attributes that make up the totality of the service

1.3.8
service delivery

supplier activities necessary to provide the service

NOTE See BS 5750-8.

1.3.9
service delivery specification

document that specifies those supplier activities and resources needed to supply the service

NOTE The service delivery specification forms part of the service specification.

1.3.10
service design (noun)

1) Set of instructions (specifications, drawings and schedules, etc.) necessary to construct an artifact or service.

2) Artifact or service itself.

1.3.11
service design (verb)

generation of information by which a required service or product can become a reality

1.3.12
service design brief

document that describes the primary purpose of a service and gives guidance

NOTE 1 Guidance can relate to such matters as its style, grade, performance, appearance, conditions of use including health and safety considerations, characteristics, packaging, conformity, reliability, maintenance.

NOTE 2 The service design brief is often the result of a feasibility study and forms the basis of the design.

1.3.13
service resolution

elements that determine the framework of the service

1.3.14
service result

measure of the achievement of service delivery

1.3.15
service specification

document that prescribes the requirements with which the service has to conform

NOTE A service specification should refer to or include drawings, patterns or other relevant documents and should also indicate the means and the criteria whereby conformity can be checked.

Section 2. Managing service design at corporate level

2.1 General

Management at the most senior level should take responsibility for the design of a service.

2.2 Corporate objectives

Corporate objectives should be precise and should, if possible, be quantified.

To manage design effectively the following information needs to be known:

a) what business the organization is in;

b) the identity of customers and their needs;

c) the quantified targets for growth, profitability or success;

d) the level of design protection required;

e) the market position sought;

f) the risks involved;

g) the image of the service organization;

h) capability of staff;

i) other resource capability;

j) other key factors critical to success, e.g. competitive pressure, regulation.

This information should be communicated to, and understood by, all concerned. Design should form an integral part of corporate planning.

2.3 Corporate planning

2.3.1 General

A business plan is required to set the targets to be met. This defines the boundaries and constraints within which design management should be conducted. The business plan should include the elements given in **2.3.2** to **2.3.5**.

2.3.2 Financial plans

Financial plans should specify the investment and cashflow requirements of the service design plans to ensure that funds are available when required. Consideration should be given to whether any new service has to meet, for example, the following:

a) a specified minimum profit margin;

b) a minimum turnover;

c) a maximum payback period;

d) a maximum service development cost;

e) budgetary constraints.

2.3.3 Service design plans

Service design plans should outline the methods of managing the design process, the controls and policies that need to be planned and executed. Consideration should be given to the following as to whether the new service:

a) should have synergy with existing products and services within the organization;

b) have a specific maximum commitment in management time;

c) have a maximum design timescale;

d) follow a specific sequence in design;

e) is the most competitive design;

f) is the most cost effective design.

It may also be necessary to consider additional factors, e.g. service confidentiality, product reliability, recording design data, quality assurances procedures, evaluation of the design process and service evaluation, including third party certification or approval.

2.3.4 Resource plans

Resource plans should define the resources available for design purposes. Consideration should be given to the following as to whether or not a new service:

a) uses, or avoids using, certain areas of technology;

b) meets some specified volume or demand;

c) is to be made available by the organization or subcontracted.

It may also be necessary to consider the following additional factors:

1) use of design consultants;

2) training and retraining of managers and staff;

3) establishing performance incentives and appropriate career paths for staff;

4) equipment needed to design the service;

5) alterations to the organizational environment;

6) systems for controlling and monitoring the design project.

2.3.5 Marketing plans

Marketing plans should ensure that once services are available, they can be delivered in the market place. These plans should cover pricing, distribution and promotion. They should also include a procedure for continuing review and assessment of new service ideas and of the market itself. The marketing plans should consider if any new service should be any of the following:

a) available by a certain date;

b) an extension of the existing product/service range;

c) promoted or sold in a particular manner.

2.4 Internal corporate communication

As all design is multidisciplinary, the plans given in **2.3.2** to **2.3.5** should be communicated to and across departmental boundaries. Procedures should be established so that effective communication is maintained throughout the design.

2.5 Corporate monitoring and controlling

The following actions are essential.

a) The market need should be continually reviewed.

b) Business plans should be updated periodically.

c) The manager at corporate level responsible for all service design should measure progress against identifiable targets so that timely corrective action can be taken if required.

d) Design progress should be reviewed in the context of business development and performance overall.

e) The manager at corporate level should receive reports from the design manager on the progress of the project. It is essential to understand the effect of change on the project and the business and take appropriate action.

NOTE These management roles should be incorporated into the service organization if they do not already exist.

f) Review points should be announced well in advance to enable staff to plan their own work schedules and prepare for such reviews in good time.

2.6 Check-list for senior management

The check-list should include the following.

a) Define, and periodically redefine, the corporate objectives.

b) Make the objectives known and understood by all involved.

c) Review, and periodically update, the business plan in line with corporate objectives.

d) Ensure that finance, service design, resource and marketing plans are compatible.

e) Provide finance and other resources to match the business plan.

f) Determine the method of managing the design and assign responsibilities.

g) Ensure that the organizational policies and procedures are adequate.

h) Ensure that those responsible for design have clear objectives and are personally motivated.

i) Ensure that the design process is planned.

j) Ensure that achievement and expenditure are monitored against time.

k) Maintain a sincere and visible commitment to high standards of service design.

l) Evaluate achievements, lack of achievements and shortfalls in achievement and communicate this evaluation to all concerned.

m) Ensure appropriate commercial protection by means such as trade marks, copyright, patent action or design registration, where this is applicable.

2.7 Evaluation

It is recommended that, after the launch of the service, a final project appraisal should be carried out by corporate management, to assess the success of the design project. (See **4.3.5** to **4.3.8**.)

Section 3. Managing service design at project level: overview

3.1 General

This section addresses those activities for managing the design of a service that are specific to the project, as distinct from the organization or corporate policies covered by section **2**.

The stages in this overview are expanded in more detail in section **4**.

3.2 Service management design model

3.2.1 General

A typical service design model is illustrated in brief in the model in Figure 2. The management of service design is the organization and management of this model. This shows the main phases of service design, the process and the expected output from each stage. All of these aspects should be considered as part of the design process although not all need be important.

It is necessary that project managers should develop a more detailed design model, that suits their particular service and situation. This general model is provided as a guide. The relative importance and sequencing of stages can vary and iteration is usually necessary. The aim should be where possible to undertake stages of the process in parallel. To ensure the design is optimized, the process should be capable of receiving feedback at any stage.

The early stages of service design are the low cost stages in the process but it is also the part where most management mistakes are made and where most of the necessary finance is committed (see Figure 3).

The stages of the service design process and the outputs from each stage as shown in the design model are given in **3.2.2** to **3.2.14**.

The initial phase is the identification of the "need".

Phase	Process	Output
		Internal to the organization
Identification of need	Trigger	Perceived opportunity ideas for new service
	Service identification	Service characteristics
	Service planning	Project proposal
	Feasibility study	Criteria for acceptability to service organization
Creation of design	Refine characteristics	Service design brief
	Concept design	Preferred option
	Outline design	Service resolution
	Detailed design	Specification for service
	Provision of means of delivery	Service package
Liability starts		*External to the organization*
Operation of the service	Introduction	Service availability
	Delivery	Service result
	Feedback	Potential improvement
Withdrawal of the service	Disposal	Continuing liability

Figure 2 — Design model

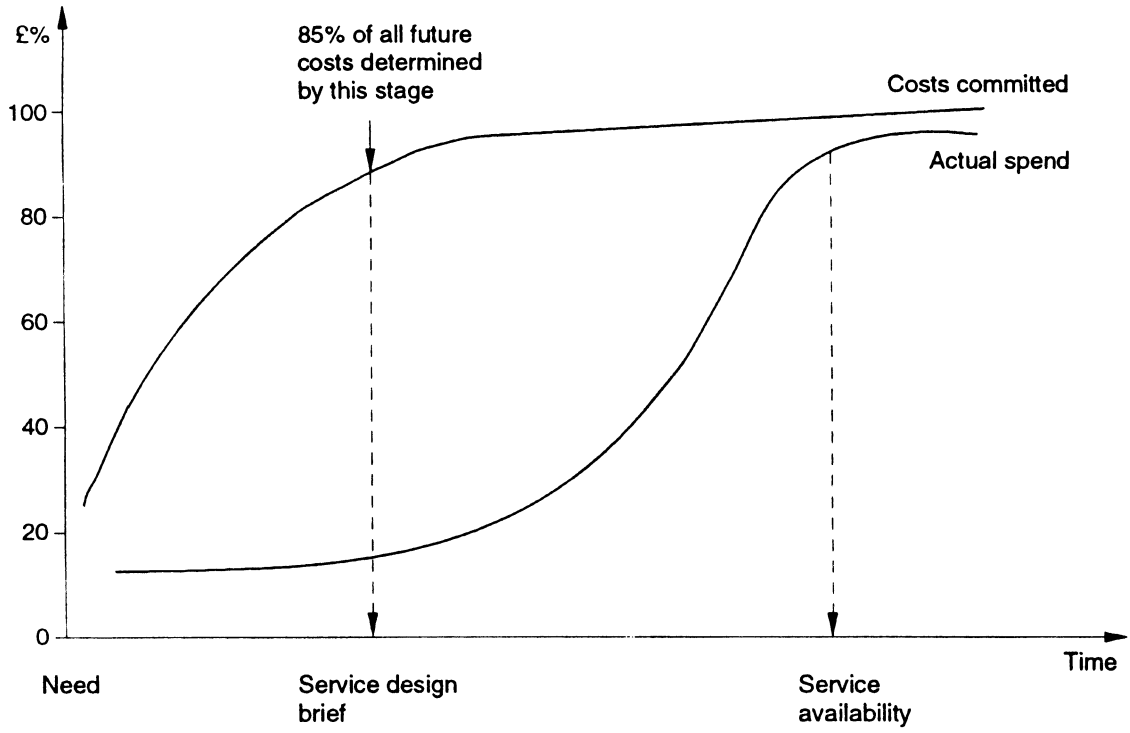


Figure 3 — A typical curve of financial commitment and expenditure

3.2.2 Process: trigger

Any service idea should fit into the company product and service boundaries as described in section **2**. There are many sources both external and internal.

The outcome of this stage should be the perceived opportunity and ideas for new services.

3.2.3 Process: service identification

This is a precise description of the intended service. It should be compatible with the corporate objectives and the business plan and should consider potential demand, outline characteristics and market segment.

The outcome of this stage should be the determination of the set of characteristics for the service, although there may still be options available as to how to achieve these service characteristics.

3.2.4 Process: service planning

This should include an outline of the service design, the resources required and the methods proposed to achieve completion. It should extend to some consideration on documentation required.

The outcome of this stage should be a project proposal that will include provisional specifications, research requirements and methodology, timescales, milestones, financial resources and costs.

Alternative means of providing the service may still exist and the desired option will be chosen at the concept design stage (see **3.2.7**).

3.2.5 Process: feasibility study

This should detail the availability of resources, the synergy with current service operations, anticipated and acceptable timescale for the design completion and availability of design resources. Estimated cost and profit should be compared to the required return on investment. The proposal should satisfy the original requirement and still comply with corporate objectives.

If feasible, the outcome of this stage should be that the defined criteria can be met. If not feasible the project may be abandoned or reassessed.

The project now passes into the "creation" of design phase.

3.2.6 Process: refine characteristics

The characteristics of the service should be refined. The outcome of this stage should be a completed service design brief that should describe a framework to which any chosen option should conform. This service design brief should define requirements and constraints, e.g. regulations but should not provide solutions.

Figure 4 shows a non-exhaustive list of elements that should be considered when compiling the brief. Not all may be relevant in all cases, but only by considering all will the important elements become apparent. The process, from **3.2.1** up to this point, should have been principally concerned with defining the service from the customer's point of view. Subsequent stages should focus on the process of developing and delivering an acceptable service to customers.

3.2.7 Process: concept design

A broad outline or concept of the service should be determined at this stage. Design methods should be used to create options.

The outcome of this stage should be the preferred option, that best fulfils the requirement described in the service design brief.

3.2.8 Process: outline design

The outline of the service should be further developed to show various features that are included in the preferred option. This should show the types of resources needed, interfaces and the mode of delivery and the framework for maintaining future awareness of market need and demand.

The outcome of this stage should be that the service is resolved into a framework of components that can now be detailed.

3.2.9 Process: detailed design

The complete service framework should then be detailed. This should include design of any literature or manuals and all resources, mode, location and timing of delivery. It should also include the quality control specification.

The outcome of this stage should be a full and detailed service specification covering what the customer will receive and what the supplier needs to do to deliver the service and monitor it.

3.2.10 Process: provision of means of delivery

This should detail the means by which the service is delivered, it is effectively a "setting up" stage. Resources such as equipment, literature and premises are developed and acquired. Also the recruitment and training of personnel is carried out.

The marketing and launch of the service should be organized.

This is the final stage of the "creation" phase and the final stage in which the evolution of the service is substantially internal to the organization.

The outcome of this stage should provide the capability to provide the service package.

The project now passes to the operation of the service phase.

NOTE With many services liability to customers could start here.

3.2.11 Process: introduction

This is the first phase of "operation" external to the organization. The service is introduced to the market. This stage should include aspects associated with the launch of a new service. The outcome of this stage should be a fully available service.

3.2.12 Process: delivery

This is the active part of the service performing to original requirements. It is usually the longest stage in the life cycle of the service.

The outcome of this stage should be a service result after every delivery. The result provides feedback and this may lead to the consequent requirement for change.

3.2.13 Process: feedback

The service providers should seek feedback from customers and their own staff that may lead to potential improvements or new services. Consideration should have been given in the design of the service to accommodate such feedback. This could call for re-entry into any stage of the model. If the model has been rigorously applied, re-entry should not be necessary at any level higher than "detailed design".

The outcome of this stage should create the potential for continuous improvement.

The next stage is now the withdrawal of service phase.

3.2.14 Process: disposal

When the service is withdrawn or discontinued or replaced there may remain a legal liability of the service provided or warranty for the service. Aspects of disposal may also be important and, at this stage, the factors planned for and described in the service design brief, should now be implemented.

Figure 4 — Some elements of the service characteristics and specification

Section 4. Managing the service design activity in more detail

4.1 Management of design

4.1.1 General

This section provides guidance to those whose prime responsibility is the management of design.

In services there is a greater likelihood than in manufacturing of designers being directly involved in the operation and provision of services. Furthermore there is a greater likelihood than in manufacturing that components or processes of the service being designed may themselves be provided as discrete services, e.g. airline catering, hospital laundering.

The detailed management of the design activity should address the following.

a) Ensure that the design process (or model) is in place.

b) Ensure that a design brief is prepared.

c) Ensure that supporting elements or infrastructure exist.

d) Develop a communications structure for the service design.

e) Proceed with implementing the design process.

f) Ensure that the final design meets design brief requirements.

4.1.2 Design model

Figure 2 shows a typical design model. This model is insufficiently detailed for the design of most services, it is therefore necessary for a detailed model of the service life cycle to be developed that suits the particular service being designed. (See **4.2** for further guidance.)

4.1.3 Communication (structure for service design)

4.1.3.1 A product champion should be appointed with the authority and responsibility to facilitate the design of the service. In organizations where there is an identifiable management team, this person should be a senior manager.

4.1.3.2 The product champion should form a multi-disciplinary design team or delegate this to the appointed project manager. This team should include personnel from finance, marketing and sales, suppliers and customers, etc. The design team should include everybody who can make a contribution to the design of the service.

4.1.3.3 People will join and leave as and when their expertise is required. The product champion should stay in the design team throughout the process to maintain continuity.

4.1.3.4 Ideally, the membership at a design team meeting should not exceed nine [1].

4.1.3.5 Design team meetings should be organized on a "round-table" basis with lateral communication. All design team members are equal but in the case of conflict between team members the product champion has the ultimate responsibility for taking the decision.

4.1.3.6 The product champion is responsible for terminating the project or changing the service brief if deemed necessary, e.g. due to the inability to satisfy the existing brief. The product champion is responsible for communicating the decision.

4.2 Expansion of design model

4.2.1 General

The purpose of this clause is to take the design model and to expand and clarify what should be considered at each stage of the design process through a series of check-lists. Each list is not exhaustive.

4.2.2 Process: trigger

An idea may be triggered from many sources. Typical sources include the following:

a) an order or enquiry from a customer;

b) community welfare need;

c) a response to a perceived market opportunity: market pull;

d) government initiatives and charters;

e) a research finding, perhaps associated with the development of a new technology: technology push;

f) a new way of applying existing technology that may result in an innovation;

g) a license or franchise agreement;

h) a creative thought from any source;

i) a change of company facilities or assets that may provide an opportunity to redesign the service, situation opportunity;

j) problems, failures, or deficiencies with existing services;

k) improvement to existing products or services to reduce their cost, simplify, rationalize or to "stretch" the design;

l) complaints and ideas from or surveys of customers, sales staff or dealers;

m) published market research findings;

n) inventors, academics, scientists or consultants;

o) new legislation, regulations, standards, codes of practice;

p) quality circles and suggestion schemes (including customer suggestion schemes);

q) observation of the competitors' services;

r) environmental issues;

s) a change in the company's or a competitor company's vision or image;

t) extending the service to get closer to the customer, e.g. direct delivery;

u) increased leisure time;

v) economic trends.

The trigger could lead to the introduction of additional on-going studies that may include specially commissioned marketing research reports, warranty or service reports and competitor activity reports completed by staff and agents.

The outcome of this stage should be the perceived opportunity and ideas for a new service.

4.2.3 Process: service identification

Each idea, from whatever source, should be assessed to establish the following whether:

a) it is compatible with corporate objectives and the business plan;

b) there will be adequate demand;

c) it will lead to a worthwhile return or benefit to justify the commercial risks or financial outlay involved.

For the proposed service, the following should be identified and evaluated:

1) the operational brief;

2) the life cycle;

3) demographics, the limitations, area and boundary of the operation;

4) competition;

5) market segment, customer and user standards;

6) size of market;

7) human resources requirements;

8) human resources available;

9) technology requirements;

10) budgetary requirements, financial resources needed/available;

11) return on investment required;

12) price and costs;

13) timescale for service delivery and availability;

14) potential for reliability, maintainability and disposal;

15) ease of use;

16) frequency of service;

17) speed of service/response;

18) guarantees;

19) special needs and service requirements;

20) environmental issues;

21) legislation;

22) politics;

23) conformance standards and regulations;

24) charters and codes of practice. The outcome from this stage should be the service characteristics.

The service characteristics should include the unique selling propositions that will give the service a market advantage over the competition. It should identify what is to be achieved.

At this stage of the process the service characteristics, in so far as they are measurable, are likely to be expressed as rough estimates and these should be refined in the subsequent stages of the design process.

NOTE 1 See annexes A and B for examples of service characteristics.

NOTE 2 See Figure 4 for elements of the service characteristics.

4.2.4 Process: service planning

The purpose of this stage is to describe what needs to be known about the service, the criteria and the constraints. How it is aimed to deliver or achieve the service characteristics. Compromises may be made between the preferred options and characteristics. There could be a check-list around each characteristic but, generally, the following types of question will need to be considered.

a) What risks are involved?

b) What proprietary protection is required?

c) What organizational arrangements are needed?

d) What procedures are required?

e) What elements of technology?

f) What information on current and past practice exists?

g) What skills?

h) What market requirements?

i) What customs and practice standards?

j) What conformance standards?

k) What resources and back-up resources?

l) What financial resources and costs?

m) What research requirements?

n) What forms of communication (internal and external)?

o) What records are required?

p) What verification including tests, models, field trials, etc.?

q) What legislation?

r) What dates and timescales?

s) When will the service be available?

t) How will the service reach the customer?

u) How will the service be used?

v) Will it provide value for money and, where applicable, a profit?

w) Is it within corporate financial capabilities?

The answers to such questions should form the project proposal that establishes the framework on which the feasibility study will be conducted.

4.2.5 Process: feasibility study

At this stage it should be confirmed whether the organization can and will be prepared to, or cannot, provide the service that will deliver the project proposal and also that it meets a market need.

The following should be confirmed:

a) the organization is capable of delivering the service;

b) this is desirable to the business;

c) the aim can be achieved in a suitable timescale;

d) it satisfies the original requirements;

e) it will meet an adequate market demand;

f) it will achieve a worthwhile return that will justify the risks involved.

Tools to be used at this stage should include the following:

1) a service audit of current capabilities of the organization, their suppliers and distributors;

2) market research;

3) benchmarking;

4) competition analysis;

5) identification of barriers to entry;

6) cost benefit analysis;

7) discounted cash flow (DCF);

8) risk analysis;

9) decision trees;

10) timescales and milestones;

11) project appraisal;

12) critical path analysis, Gantt charts and other project planning techniques.

This information should define the criteria for acceptability to the service organization. More questions may be raised that will refine the feasibility study and will need to be answered before moving to the creative stage of the process.

On completion of this stage the organization should have sufficient confidence to commit resources to create the service.

4.2.6 Process: refine characteristics

At this stage of the process the information so far compiled should be used and expanded into a complete service design brief. The elements to be included will vary depending on the type of service being designed but a typical list of main elements is shown in Figure 4. These may be broken into other subheadings.

The following should be observed [2].

a) Details of each element should be documented.

b) Each element should be considered to identify which element is relevant and important and which is not, for each situation.

c) Consider each element from a customer's perspective, the supplier's perspective and the interface between the two.

d) Details should be quantitative rather than qualitative, e.g. "hotel room temperature to be comfortable" is wrong, "hotel room temperature to be 20 °C" is correct.

e) Where possible, put a tolerance on all quantities.

NOTE The tighter the tolerance generally the higher the cost of providing it.

f) Identify the "essentials" and the "desirables".

g) Identify and include the unique selling propositions (USPs).

h) Comparison with state of the art and previous designs.

4.2.7 Process: concept design

It is at this stage that the emphasis should move over from what the customer will receive to the mechanics of providing the service. The concept design gives the intended "picture" of what the service will look like. There should be several options that fulfil the requirements of the service design brief.

The following should be undertaken.

a) Initially the concept stage should generate as many options as possible that fulfil the requirements of the service design brief. This is best undertaken in multidisciplinary groups and in comfortable undisturbed surroundings. Quantity of ideas is more important than quality at this stage. Finding original ideas takes time and Figure 5 shows how the generation of ideas and options will emerge in a brainstorming exercise. It is important not to give up when ideas seem to dry up; this is the gestation period from which new ideas will stem [3].

Tools to be used to aid this process include brainstorming, value analysis and design methods such as the following:

1) analogy [4];

2) combination [4];

3) lateral thinking [5];

4) inversion [4];

5) delphi [4].

Factors such as presentation, methods, responsibilities and detailed functional requirements, should be reviewed.

b) Having developed a series of possible concepts, identify the preferred option. This may be the combination of several concepts and those that best satisfy the service design brief.

Tools to be used in this process include rating, ranking, classification risk analysis and matrices.

4.2.8 Process: outline design

This stage of the process adds detail to the preferred option, and brings together the elements to form the service resolution.

This should involve consideration of, for example, the following:

a) broad types of:

1) skills (e.g. HGV driver);

2) technology (e.g. software);

3) equipment (e.g. photocopier);

4) premises (e.g. retail outlets);

5) communication (e.g. telephone/fax);

6) distribution methods (e.g. mail order);

7) promotion (e.g. advertising, public relations);

b) legislation to be covered, including health and safety in the workplace, contract law, product and service liability.

NOTE In addition to the elements given in a) and b) being used to determine the framework of the service with respect to its provision, these elements should also be used to determine a framework for maintaining future awareness of the market and covering areas of risk.

4.2.9 Process: detailed design

In this stage of the process, specific details should be provided. The following are two examples of detailing the broad design elements given in **4.2.8**.

a) *Specific required skills*:details that may be included in a full job description, for example HGV drivers class A aged 26 or over, clean driving licence, minimum 5 years experience.

b) *Specific legislative review*: for example, visual display regulations, noise regulations, Control of substances hazardous to health (COSSH) and other environmental and employment regulations.

At the end of this stage, there should be sufficient information to be able to specify and provide the service.

An example of a partial service specification is given in annex A. Further guidance on the type of specification is given in appendix C of BS 7373:1991.

4.2.10 Process: provision for means of delivery

In this stage of the process, the necessary actions should be taken to provide the service package.

Examples are as follows:

a) recruit;

b) train;

c) purchase;

d) lease;

e) prepare;

f) provide;

g) distribute;

h) test;

i) print.

This stage should result in a service package being available and ready for introduction into the market.

NOTE Up to this point, the majority of the considerations have been internal to the organization. In subsequent stages, the considerations are external to the organization; practical liability to the customer begins.

4.2.11 Process: introduction

At this stage the service is being introduced in the user domain and is available for delivery.

Factors to be considered in the introduction may include the following:

a) promotion;

b) pilot scheme;

c) the launch;

d) customer or agent training;

e) seminars and workshops;

f) technical advice and problem solving.

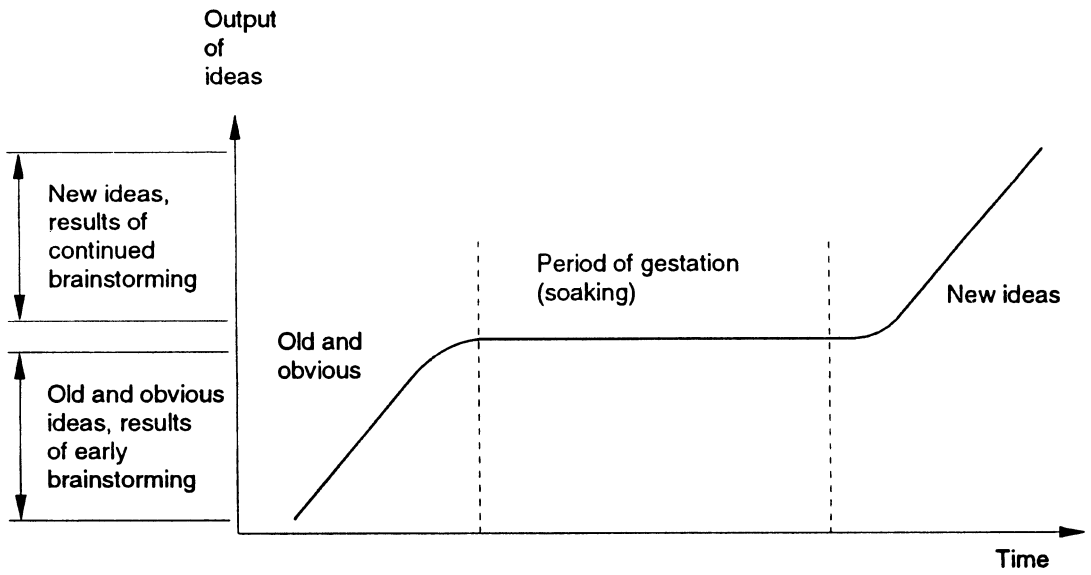


Figure 5 — Brainstorming activity

4.2.12 Process: delivery

The service should be performed as laid down in the service specification.

The delivery should be relatively straightforward if the previous elements of the model have been fully processed.

This stage may include, for example, the following actions:

a) implement procedures for delivery;

b) monitor effectiveness;

c) identify problems;

d) identify market perception.

The service is now being used.

4.2.13 Process: feedback

Having gained experience of customer reaction and market evaluation, problems should be identified in this stage and fed back into the appropriate stage of the model to provide potential for continuous improvement.

Types of issue that may result in feedback are as follows:

a) changes in the market (e.g. customer perception);

b) return on investment;

c) competitor activities;

d) deviation from specification;

e) customer complaints;

f) new technology;

g) experience;

h) demographic changes.

4.2.14 Process: disposal

The provision of the service is stopped.

Factors to be included in this stage should have been considered in the creation stage of the service, but are implemented here.

These may include the following:

a) warranty;

b) disposal;

c) waste management;

d) biodegradability;

e) service and maintainability;

f) spares and provision;

g) skills provision;

h) continuing safety and security;

i) recycling;

j) social and environmental impact;

k) reinstatement;

l) transfer/sale of project.

NOTE Liability to consumers may continue and some aspects of the service may continue to be used after the service has been withdrawn.

4.3 Design control, verification, review and evaluation

4.3.1 General

There are four principal but interrelated activities that should be actioned for design implementation, i.e. control, verification, review and evaluation.

4.3.2 Design control

The project manager should maintain control over the design project to bring it to a successful and timely conclusion.

In addition the project manager should systematically monitor the project to ensure that it is still on course to meet the design brief especially with respect to performance, cost and timescale and eventual profitability. Deviations from plans should be endorsed or else corrected swiftly to prevent wastage on an incorrect course.

Appropriate records should be kept and changes to working documents should be systematically controlled as to status and distribution. This should form part of a quality document control system.

Design control is maintained by design review where the procedure is set up to ensure that the design is scrutinized at a series of formal meetings.

4.3.3 Design verification

Verification should establish that the design conforms to the requirements of the brief and hence the potential customer.

The technique used should include, where appropriate, the following:

a) testing: by field trials, pilot schemes, market testing, etc.;

b) independent verification of the design and any associated calculations.

4.3.4 Design review

At a number of stages in the design process of which some will have been predetermined, a formal, systematic and critical review of the design results so far should be conducted by suitably qualified persons.

Formal design review meetings should take place after every stage of the design process as represented in the design model; whenever any major problems occur and before any capital investment. In the interest of continuity, design reviews should normally be chaired by the product champion or project manager who should ensure that actions and responsibilities are clearly defined and properly recorded.

Design review meetings should include members of the design team and be supplemented by others with relevant objectivity. It is often of great benefit to include suppliers, subcontractors and customers on design review panels at appropriate stages.

The agenda for design review meetings should be circulated at least one week in advance and include the following:

a) any points on which a decision is to be taken;

b) those responsible for providing information needed;

c) who will be presenting the topics under consideration.

Design reviews should identify opportunities, risks, problem areas, potential shortcomings, pinpoint any gaps in the brief that need following up and initiate corrective actions.

Topics for discussion should include (as appropriate) the following:

1) comparison with the design brief;

2) the programme;

3) change of scope or range of the services;

4) safety and environmental impact;

5) consideration of potential misuse and unintended use;

6) expected performance;

7) comparison with alternative designs, and competitors' services;

8) comparison with similar designs paying due heed to problems encountered;

9) compliance with regulations and standards and other mandatory requirements;

10) resources and training needs;

11) reliability, risk and maintainability;

12) acceptance/rejection criteria of the services;

13) ability to diagnose and correct problems;

14) warnings and proper user instructions;

15) ease of start up, implementation, and provision and use of the service;

16) service inspection and monitoring requirements;

17) specification of bought out product and sub-contract services;

18) approval of suppliers and subcontractors;

19) fitness for purpose;

20) handling, storage and packaging considerations, including provision for items with a shelf life used in the service to be provided;

21) pilot schemes;

22) project costs and realization of forecast financial returns;

23) disposability (withdrawal and continuing liability).

NOTE 1 This is becoming increasingly important with the introduction of wide ranging environmental legislation.

Minutes should be taken at design reviews and these should be kept filed throughout the life of the service for product and service liability reasons.

The minutes of the meeting should contain a dated action column and name the person responsible for seeing this action is carried out.

Follow up action should be monitored by the product champion.

As a result of the review, the project manager, as part of the review team, can undertake the following:

i) identify and confirm the solutions to problems if required;

ii) change the course of the design;

iii) recommend an increased budget;

iv) recommend changes in the design brief;

v) authorize supplementary studies;

vi) halt the design.

NOTE 2 Termination of the project is the responsibility of the product champion.

Before permitting a change during the review, the effect on other associated elements of the service or spin-off elements that could be affected by the changes should be considered.

4.3.5 Design evaluation

Design evaluation should occur at the end of the design process. Planned evaluation should also take place periodically (e.g. every 6 months) to identify if the service is performing as expected.

Design managers should ensure that members of the project design team contribute to and are involved in the evaluation. They should also ensure that any recommendations and necessary corrective actions arising from the evaluation are properly implemented and carried forward into future projects.

The overall questions in evaluation can be phrased simply as follows.

a) How close have we got?

b) Were the targets met?

c) How good was our design process: can we improve for the next time?

Evaluation therefore falls into three principal categories as follows.

1) Evaluation of the service against the design brief.

2) Evaluation of the management of the design project.

3) Evaluation of the design process.

4.3.6 Evaluation of the service against the design brief

There are three interrelated areas to consider as follows.

a) *Customer evaluation*. Customer feedback should always be sought. It is a prime element of customer care and continuous improvement. This includes an evaluation of demonstrations, promotions, user manuals, customer training needs, value for money, quality and reliability, trial runs and test marketing and ease of use/delivery of the service.

b) *In-house evaluation*. This is a self analysis and the criteria will normally include: rate and level of take up of service, reaction of competition, wastage, contribution to profit, meeting the company plan, training needs, return on investment, reports on complaints and recovery action taken, e.g. warranty, ease of operation within the organization, changes in reputation and standing of the organization.

c) *Independent evaluation.* This may be carried out to independent standards if such apply and may in some cases be a legal requirement. Elements of this evaluation may include: independent assessment to the appropriate standard in the BS EN ISO 9000 series[1)], public sector standards, e.g. in healthcare, compliance with specific regulations, e.g. for electrical installation services.

4.3.7 Evaluation of the management of the design project

Before concluding the project the design manager should evaluate the management of the project and draw up recommendations for improvement. The questions to be addressed should include the following.

a) Were the targets met and if not, why not?

b) Were the plans appropriate and feasible?

c) Were the correct targets set?

d) Could the targets have been exceeded, for example, by undertaking stages in parallel.

e) What hindrance to the successful outcome of the project needs specific attention for the benefit of new projects?

f) Were the company-wide resources and systems adequate to support the project?

g) Was the motivation and use of staff both internal and external adequate?

h) What was the contribution of subcontract design staff?

[1)] Formerly BS 5750.

i) What was the contribution of consultants?

j) Were the right staff recruited?

k) Were the job descriptions and salary scales adequate?

l) Were the organization structures appropriate?

m) Was the training of staff adequate?

n) Were all the objectives achieved?

o) Was the planning comprehensive?

p) Were the procedures specific to the project adequate? Were they compatible with the standard procedures?

4.3.8 Evaluation of the design process

Whilst the service design model (see Figure 2) illustrates the main stages of service design, each design project will be a discrete process. An evaluation of the service design process should always be carried out. A review of the progress of the design process as shown in the design model may reveal areas where improvement can be made for the next design venture.

The evaluation of the design process should examine both company procedures and those that are specific to the project. It is essential to record data during the progress of the project so that evaluation does not rely on memory alone. The evaluation may include the following topics:

a) design procedures;

b) documentation systems;

c) design reviews;

d) change control systems;

e) information systems;

f) roles and responsibility;

g) internal and external communication procedures in design;

h) project planning systems;

i) auditing of procedures and the timing of the audits.

Annex A (informative)
Example of partial service characteristics and specifications

An example of partial service characteristics and specifications for a carpet cleaning business is given in Table A.1.

Table A.1 — Example of partial service characteristics and specifications for a carpet cleaning business

Characteristics	Specification
Boundary of operation	5 miles radius
Market segment	Target home owners and small business premises
Size of market	Target 250 000 potential customers in an identified area of operation
Manpower requirements	Two driver operators and one administrator/secretary
Working times	Tuesday to Saturday 9.00 am to 6.00 pm, Monday half day for administration and machine maintenance
Technology requirements	Three Whamo carpet cleaners, two 700 kg vans, 10 boxes of non-toxic cleaning fluid
Financial resources needed	£ 12 000 start-up costs
Timescale for service delivery	Estimated travel time 1 h, estimated time for cleaning 2 h
Training time for Whamo machines	3 h
Frequency of service	Two operators each doing three visits per day for a 5 day week
Speed of response	Orders completed in 1 week
Guarantees	All works insured, insurance cover £ 5 000

Annex B (informative)
Examples of services and service characteristics

Some characteristics by which a service can be measured and may determine a preferential service, are given in Table B.1. These short lists are simply typical examples. Some characteristics such as price, skills, etc. affect all the examples given in Table B.1.

Table B.1 — Examples of services and service characteristics

Service	Service characteristics
Catering	Wide range Vegetarian Hygienic controls Ambience
Hotel	Range of room sizes Leisure facilities Heating Quietness Videos Mini bar Helpful staff
Tourism	Language training (of personnel) Computerized booking Real time access to booking data
Airline	Easy passenger transit Timeliness Inter airport travel facilities (e.g. in re-direction) Reliable information to travellers
Road transport	Accuracy and speed of delivery Back up facilities (vehicle breakdown)
Health	Shorter waiting list Shorter waiting time Wide range of community care facilities Responsiveness to the individual patient
Optician	Speed of service Range of lens types Technology
Building maintenance and repair	Speed and cover of call out service Range of skills
Waste management	Control of toxins Leachate Gas emission levels Control of litter spread
Stockist	Range and level of stock Speed of replenishment Control of the storage environment Own delivery service
Bank	Opening hours Lobby service facilities Range of financial services Speed of cheque clearance Knowledge of individual client

Table B.1 — Examples of services and service characteristics

Service	Service characteristics
Architecture	CAD 3D modelling Full project management Control of systematic working
Consultancy	Provide training courses to support consultancy services Range of other consultancy services provided Develop a "Business Club" for clients
Fire	Cover and call out speed Fire prevention advice Counselling
Personnel	Employment law expertise Benefits expertise Counselling
Chiropodist	Visiting practice Massage Reflexology

Annex C (informative)
Bibliography

Christopher, M. *The customer service planner*. Butterworth Heinemann, 1992.

Cowell, D.W. *The marketing of services* 2nd revised edition. Butterworth Heinemann, 1991.

Crimp, M. *The marketing research process*. 3rd edition. Prentice-Hall, 1990.

Heskett, J.L., Sasser, W.E. Jr. and Hart, C.W.L. *Service breakthroughs: Changing the rules of the game*. New York: Free Press, 1990.

Hiles, A. Service level agreements. *Managing cost and quality in service relationships*. Chapman & Hall, 1993.

Kotler, P. *Marketing management: analysis, planning, implementation and control*. 7th edition. Prentice-Hall, 1992.

Lovelock, C.H. *Managing services; Marketing, operations and human resources*. New York: Prentice-Hall, 1988.

Majaro, S.*Managing ideas for profit — The creative gap*. McGraw Hill, 1992.

Normann, R. *Service management*. Wiley, 1991.

Parasvraman, A., Zeithaml, V.A., and Berry, L. *Delivering quality service: Balancing customer perceptions and expectations*. New York: Free Press, 1990.

Topalian, A. *The managing of design projects*. Associated Business Press, 1980.

Wall, R.A. ed., *Finding and using product information*. Gower, 1986.

blank

List of references (see 1.2)

Normative references

BSI publications

BRITISH STANDARDS INSTITUTION, London

BS 4778, *Quality vocabulary.*
BS 4778-1:1987, *International terms.*
BS 4778-2:1991, *Quality concepts and related definitions.*
BS 4778-3, *Availability, reliability and maintainability terms.*
BS 4778-3.1:1991, *Guide to concepts and related definitions.*
BS 4778-3.2:1991, *Glossary of international terms.*
BS 7000, *Design management systems.*
BS 7000-1:1989, *Guide to managing product design.*

Informative references

BSI publications

BRITISH STANDARDS INSTITUTION, London

BS 3811:1993, *Glossary of terms used in terotechnology.*
BS 5750, *Quality systems.*
BS 5750-4:1990, *Guide to use of BS 5750-1 "Specification for design/development, production, installation and servicing" Part 2 "Specification for production and installation" and Part 3 "Specification for final inspection and test".*
BS 5750-8:1991, *Guide to quality management and quality systems elements for services.*
BS 5750-13:1991, *Guide to the application of BS 5750-1 to the development, supply and maintenance of software.*
BS 7000, *Design management systems.*
BS 7000-2:1994, *Guide to managing the design of manufactured products*[2)].
BS 7000-4:1994, *Guide to managing design in construction*[2)].
BS 7000-10:1994, *Glossary of terms used in design management*[2)].
BS 7373:1991, *Guide to the preparation of specifications.*
BS EN ISO 9000, *Quality management and quality assurance standards.*
BS EN ISO 9000-1:1994, *Part 1. Guidelines for selection and use.*
BS EN ISO 9001:1994, *Quality systems — Model for quality assurance in design, development, production, installation and servicing.*
BS EN ISO 9002:1994, *Quality systems — Model for quality assurance in production, installation and servicing.*
BS EN ISO 9003:1994, *Quality systems — Model for quality assurance in final inspection and test.*
BS EN ISO 9004, *Quality management and quality system elements.*
BS EN ISO 9004-1:1994, *Part 1. Guidelines.*

[2)] In preparation. Referred to in the foreword only.

Other publications

[1] Schein, E.H. *Process consultation: Its role in organization development*. Addison-Wesley, 1969.

[2] Hollins, G. and Hollins, W.J. *Total design. Managing the design process in the service sector*. Pitman, 1991.

[3] Osborn, A. *Applied imagination*. New York: Scribner, 1953.

[4] Jones, J.C. *Design methods: Seeds of human futures*. 2nd edition. Chichester: Wiley, 1970.

[5] deBono, E. *The use of lateral thinking*. Penguin, 1971.

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: 020 8996 7002. Fax: 020 8996 7001.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL