

Guide to

A framework for user requirements for Information Technology

Committees responsible for this Draft for Development

The preparation of this Draft for Development was entrusted by the Business Strategy Forum (BSFD/-) to Technical Committee BSFD/1 (Framework Working Group), upon which the following bodies were represented:

- Architecture Projects Management Ltd.
- British Aerospace plc
- British Computer Society
- British Petroleum Co. plc
- British Telecom plc
- CCTA: The Government Centre for Information Systems
- Hoskyns Group plc
- IBM UK Ltd.
- ICI
- ICL
- Inland Revenue
- JMA Information Engineering Ltd.
- Ministry of Defence

This Draft for Development, having been prepared under the direction of the Business Strategy Forum, was published under the authority of the Standards Board and comes into effect on 15 September 1992

© BSI 03-2000

The following BSI reference relates to the work on this Draft for Development:
Committee reference BSFD/1

ISBN 0 580 20944 X

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Definitions	1
3 Overview	1
3.1 Objectives of the framework for user requirements	1
3.2 The need for a related framework for standards and technology	2
3.3 Identifying user requirements	2
3.4 Benefits of using the framework	3
4 The framework for user requirements	3
4.1 The concepts of the framework	3
4.2 The concept of strategic business factors	4
4.3 The concepts of business functions, data and systems	4
4.4 The concept of generic IT services	5
4.5 The concept of functional qualities	6
Annex A (informative) Using generic IT services and the framework for standards and technology to identify standards requirements	8
A.1 General	8
A.2 Developing a framework for standards and technology	8
Annex B (informative) Using the frameworks	10
B.1 Necessary processes	10
B.2 The relationship between the frameworks	10
B.3 Users of the frameworks	11
B.4 Aggregating requirements	12
B.5 Benefits of using the framework	13
B.6 Use of checklists and examples	13
Annex C (informative) Pivotal role of generic IT services	14
Annex D (informative) Examples of different framework concepts	14
D.1 Strategic business factors	14
D.2 Business functions, data and systems	15
D.3 Functional qualities and their metrics	20
Figure 1 — The two frameworks	2
Figure 2 — The concepts of the framework for user requirements	3
Figure A.1 — Illustrative mapping between generic IT services and their supporting elements	9
Figure B.1 — The use of the frameworks	11
Figure B.2 — The relationships between the two frameworks	11
Figure B.3 — Aggregating enterprise needs into requirements for generic IT services as input to the standardization process	12
Table 1 — Generic IT services	7
Table D.1 — Typical business functions and example activities	16
Table D.2 — Typical business data and scope	17
Table D.3 — Typical business functions, example activities and business systems	17
Table D.4 — How business systems may be supported by generic IT services	19
List of references	Inside back cover

Foreword

This Draft for Development has been prepared by the Business Strategy Forum of DISC (Delivering Information Solutions to Customers through International Standards), the part of BSI that is responsible for the development and promotion of Information Technology (IT) standards. It describes a way in which an enterprise can identify and describe requirements for services that IT can provide by linking business needs to those services. It is aimed both at management concerned with setting policy (including business managers requiring to deploy IT as well as IT strategic planners) and at those with knowledge of IT concerned with interpreting business requirements in terms of requirements for IT.

The preparation of this Draft for Development has been much helped by contributions drawing on the experience of a number of organizations, and in particular inputs from the International Government Forum for Open Systems (IGFOS), CCTA: The Government Centre for Information Systems, X/Open and representatives of the Institute of Electrical and Electronic Engineers' (IEEE) P1003.0 Working Group¹⁾.

This *Framework for user requirements for Information Technology* is being published as a Draft for Development for the reasons explained above. Throughout the Draft for Development, it is referred to simply as "this framework for user requirements". Its further development needs discussions and joint work with other interested groups, both in the UK and internationally. Particular activities should include the following items.

- a) Seeking of comments by DISC on the concepts and approach proposed in this Draft for Development.
- b) Development by the Framework Working Group of a questionnaire to obtain feedback from the full DISC membership, leading to a further revision of the framework.
- c) Alignment of this framework for user requirements and the categories of standards areas that the DISC Priorities Working Group is developing.
- d) Encouragement of other groups to work on a "framework for standards and technology" as outlined in Annex A, using the concepts of generic IT services and functional qualities (see 4.4 and 4.5).
- e) At some future time, consolidation of this framework for user requirements with a framework for standards and technology. That consolidation will then produce an overarching framework that can be used to identify the needs for standards and show how those standards can effectively be used and exploited.

At a suitable stage in its development it is intended that the further development of this framework for user requirements should be proposed to ISO as a new work item.

In this Draft for Development, the scope and definition clauses are followed by a clause giving the rationale for and objectives of a framework and a summary of its contents (clause 3). Clause 4 presents the structure and concepts of the framework. The four informative annexes contain further instances of framework concepts and two examples of its use.

This publication is not to be regarded as a British Standard

It is being issued in the Draft for Development series of publications and is of a provisional nature because the subject matter is still under technical development requiring wider exposure. It should be applied on this provisional basis, so that information and experience of its practical application may be obtained.

¹⁾ Research of the IEEE P1003.0 Working Group is available in the publication *Draft Guide to the POSIX Open System Environment*, P1003.0 Draft 14 [1].

A review of this Draft for Development will be carried out not later than 2 years after its publication. Notification of the start of the review period, with a request for the submission of comments from users of this Draft for Development, will be made in an announcement in the appropriate issue of *BSI News*.

According to the replies received, the responsible BSI Committee will judge whether the Draft for Development can be converted into a British Standard or what other action should be taken.

Observations which it is felt should receive attention before the official call for comments will be welcomed.

These should be sent to the Secretary of BSI Technical Committee BSFD/1 at the BSI Head Office, 2 Park Street, London W1A 2BS.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 24, 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.

1 Scope

This Draft for Development describes a framework for user requirements for Information Technology and presents some general guidance on the application of such a framework. It does so by proposing a way in which an enterprise (i.e. the user) can identify its needs for the services that Information Technology (IT) might in future provide, and can describe those needs in business terms. However, it is not a tutorial document and does not provide detailed guidance relating to the processes appropriate to specific needs.

This framework for user requirements encompasses any IT required to support those activities of an enterprise that manipulate or depend on information in some way.

2 Definitions

For the purposes of this Draft for Development, the definitions given in BS ISO 2382-1 *Data processing — Vocabulary*, Part 01:1984 *Fundamental terms* apply, as well as the following:

2.1

business data

the set of enterprise-relevant data which is a common resource for business functions (2.2)

2.2

business function

a discrete group of related activities that supports one aspect of the mission of the enterprise

2.3

business system

a system which performs one or more of the tasks of one or more business functions by transforming a set of inputs, using a set of rules and procedures, to produce a set of outputs

2.4

framework

a structured collection of concepts and their relationships which scopes a subject and enables the partitioning and interrelation of the topics relevant to that subject to be expressed by a common means of description

2.5

framework for user requirements

a description of the generic processes and related concepts by which enterprises may identify requirements, together with a list of generic IT services (2.7) and a list of functional qualities (2.6), including a set of information categories. Taken together, the processes, concepts and lists allow the categorization and aggregation of user requirements

2.6

functional quality

an attribute of a generic IT service that determines inter alia the level of service required and the type of information on which that service operates

2.7

generic IT service

a designated grouping of IT-based components, providing a commonly needed group of capabilities which are comprehensible from both user and supplier viewpoints

2.8

information technology (IT)

the technical methods of achieving the production, storage and communication of information using computers and micro-electronics

2.9

service

a benefit conferred on an enterprise, an organization, a person or a process by the performance of functions on their behalf

2.10

strategic business factor

a characteristic of an organization that determines how it operates by encapsulating a principle or ethical value that can be used to guide courses of action

2.11

standards-makers

those individuals who are directly involved in the preparation and ratification of standards

3 Overview

3.1 Objectives of the framework for user requirements

Information Technology is becoming an increasingly important factor in supporting enterprises to achieve their business objectives. So much so that enterprises, in forming their corporate strategies, need to establish an information strategy to assist the development of both an infrastructure and a set of facilities for managing information. The capability of the technology, together with the availability or lack of appropriate standards can, and does, influence or inhibit the development of information and hence corporate strategies.

The high level business need is for standards to help enterprises and people to work together in using information. This framework comprises constructs and processes that will support that need, allowing strategic considerations and business needs to be expressed at an appropriate level of detail and the standards-making process to be influenced accordingly. These requirements need to be expressed in common terms, and preferably to call up a common set of building blocks. In this framework for user requirements, the common building blocks are provided by the concept of generic IT services (see 2.7) which are invoked to satisfy requirements where possible.

This framework for user requirements therefore has the following specific objectives.

- a) It should enable an enterprise to express its particular requirements for information systems.
- b) It should enable enterprises to express their requirements collectively, and to do that in a way that makes it possible for others to ascertain the needs and priorities for standards.

This framework should also assist enterprises to achieve competitive advantage through flexible exploitation of common components.

3.2 The need for a related framework for standards and technology

There is a need for standardization in the area of information systems and in how particular and general statements of user requirements are interpreted. An additional framework, “a framework for standards and technology”, would help to meet this need.

This Draft for Development does not describe a framework for standards and technology in any detail but recognizes the need for its existence. Work is going on elsewhere²⁾ on the equivalent of a framework for standards and technology, and close liaison will be maintained with such activities. For a description of the relationship between the two frameworks and the simultaneous processes that operate upon them, see Annex B.

The two frameworks are related through the concepts of generic IT services and their functional qualities as shown in Figure 1.

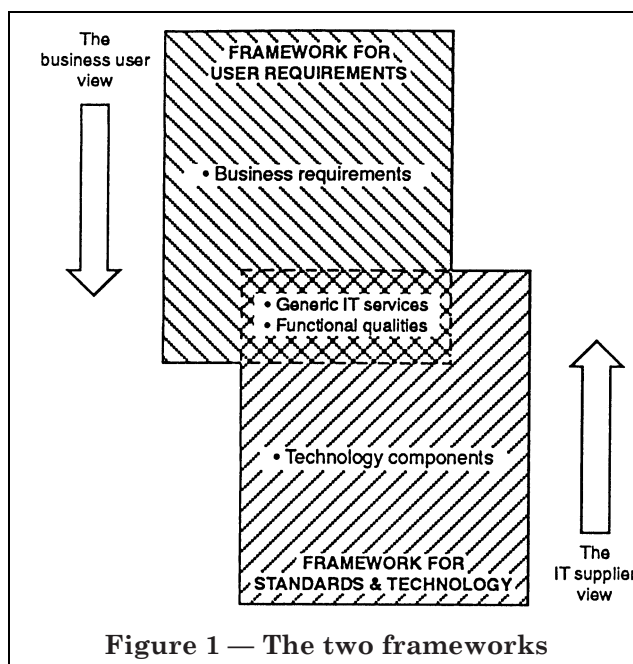


Figure 1 — The two frameworks

The generic IT services are clearly defined in a form that is meaningful to business and are also structured sufficiently unambiguously to link directly to a framework for standards and technology that will allow the IT suppliers to select standards and specifications for use in products with a view to meeting these business needs.

Generic IT services are thus pivotal in linking the two frameworks and, for an explanation of this pivotal role, see Annex C. With the guidance of these two frameworks, businesses can express needs in their own terms and are shielded from the complexities of the component technologies; on the other hand, the suppliers of those technologies can decompose the business needs more easily into product specifications.

3.3 Identifying user requirements

This framework for user requirements promotes the development of consolidated statements of requirements that:

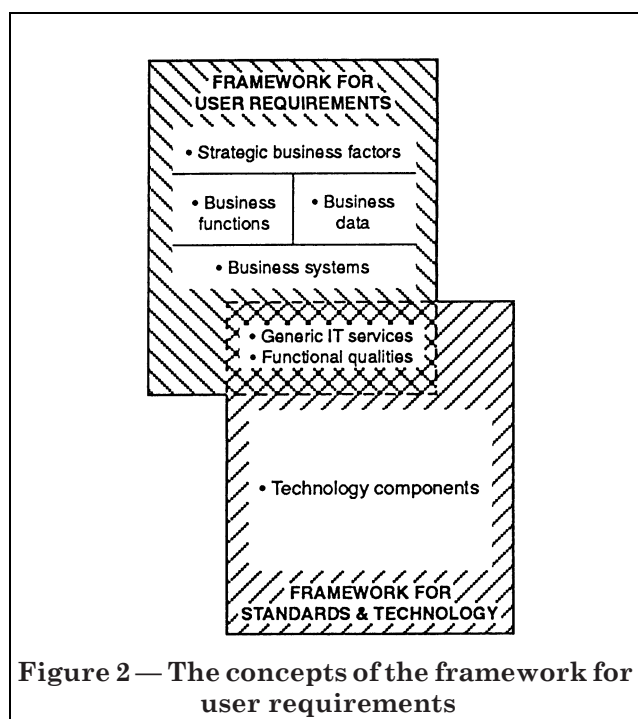
- a) are based on the business needs of enterprises;
- b) are expressed in terms of technological capability meaningful to such enterprises (i.e. not at the detailed level of more technical standards);
- c) show the relative importance and value placed on particular attributes of generic IT services;
- d) are classified so that the need for corresponding standards can be identified.

²⁾ For example, work in a European Workshop on Open Systems' (EWOS) expert group, in CCTA's Framework for Open System Standards project and in the IEEE POSIX Open Systems Environment project 1003.0.

Formally basing user requirements on the aggregated needs of several enterprises would require the following.

- 1) A process of enterprise analysis for each enterprise which is carried out typically in terms of strategic business factors, business functions and business data (see clause 4).
- 2) A determination of business systems needed by the enterprises.
- 3) An analysis and aggregation of those needs in terms of requirements expressed in a common format, for supporting generic IT services also expressed in a common format.
- 4) An assessment of priorities and organizational/distribution requirements typically derived from an analysis of business plans for each business function.
- 5) An assessment of priorities that relates to the corresponding generic IT services.

These business-oriented concepts are illustrated in Figure 2. They help to ensure that user requirements are based on the elicited needs of enterprises, without implying any particular approach to decomposition.



In practice, different organizations have different structures and therefore may select an approach which is more or less rigorous when analysing their requirements. This Draft for Development does not prescribe any approach for an enterprise, neither does it expect an enterprise to allocate the effort needed for such an analysis if it is not already available. However enterprises should be able to identify and relate to the concepts of business functions, business data and business systems that would result from such an enterprise analysis.

3.4 Benefits of using the framework

The concepts contained in this Draft for Development may help enterprises to appreciate the overall role that can be played by IT in their business. These concepts may also be helpful in the various business processes of developing a mission statement, a business strategy, an IT strategy, a strategic infrastructure and a realignment to the business strategy. However the essential requirement for this Draft for Development is that it be adequate to support users in determining and representing their requirements, and to do so in a way that will influence the standards-making process.

4 The framework for user requirements

4.1 The concepts of the framework

4.1.1 General

A number of concepts are involved in making up a framework for user requirements. This set of concepts comprises strategic business factors (see 2.10), business functions (see 2.2) [with their related business data (see 2.1) and business systems (see 2.3)], generic IT services (see 2.7) and functional qualities (see 2.6). Together they should enable an enterprise to identify the processes and mechanisms related to the IT that it needs. These concepts are detailed in 4.2, 4.3, 4.4 and 4.5.

4.1.2 Implementation of the concepts

One starting point for the development of a strategy for IT would be for a particular enterprise to interpret its mission statement in terms of business objectives, key business processes and existing resources. At an appropriate stage, this interpretation process would develop into an analysis of specific requirements for business functions, business systems and supporting IT services. The enterprise could then identify the strategy and the appropriate IT components necessary to support it.

4.2 The concept of strategic business factors

Since strategic business factors are those characteristics of an enterprise that determine how it operates, the process of enterprise interpretation and analysis should be guided by those strategic business factors of the enterprise which in combination represent the ethos of the organization. For example a desire for local autonomy and accountability would emphasize the need for standards for distributed processing, while a centralist approach might emphasize tightly controlled development of highly reliable corporate databases. Enterprise interpretation and analysis should result in a set of identified business functions and systems that form a major input to the development of a strategy for IT.

The choice of particular capabilities required in generic IT services should be guided by lower level interpretations of the enterprise's strategic business factors and by more process- and user-oriented considerations such as the need for timeliness of information and the ability to evolve. Further, more detailed examples are given in **D.1**. IT can be a key enabler of a new culture in supporting enterprise objectives.

Strategic business factors are essentially qualitative, so they are not used directly in this framework for user requirements. However, an enterprise may find it helpful in assessing the required functional qualities for each generic IT service (see **4.4** and **4.5**) to review that service against its own strategic business factors.

4.3 The concepts of business functions, data and systems

4.3.1 The concept of business functions

A business function is a discrete group of related activities that supports one aspect of the mission of the enterprise. In total, the business functions provide complete support to the mission. Each business function therefore describes a convenient grouping of functionality that is seen as necessary because of the essential nature of the business, for example sales/marketing, product development or information management. Other examples are given in **D.2**.

Business functions may or may not be equivalent to a departmental role. They are essentially independent of the organizational structures that undertake them. Because of this, they provide clear pointers to the types of information systems that are needed for the enterprise to further its mission, to support its values and to achieve its objectives.

A review of business functions provides an opportunity to analyse core processes of the organization and exploit IT to re-engineer these processes (and conversely to avoid automating old, sub-optimal processes).

Several decomposition levels of business functions may be identified and, at the lower levels, common, cross-functional activities are likely to appear. Examples might be production, quality assurance and payment. If these are to be managed cross-functionally, they place additional user requirements on the business systems and generic IT services which support them.

4.3.2 The concept of business data

Business data is that information which is needed for the activities of business functions, for example information about products, services, customers, suppliers, employees, locations, equipment and skills.

Needs for information and for processing that information are in some sense dual, and requirements can be identified from either viewpoint. Establishing the requirements for business data is crucial to the understanding of requirements for business systems and generic IT services. Requirements to share business data across business functions, organizational units, locations and even different enterprises can be particularly revealing. Further examples of some common types of business data are given in **D.2**.

Business data can be of different kinds and of different qualities. It can encompass pure data (raw facts), structural data (data about the form or meaning of data), information (summarized/processed data as in a monthly sales report), knowledge (human interpretation of multiple channels of information) and wisdom (knowledge combined with experience and vested in people or expert systems). It can also be represented in many different forms and stored on, or carried by, many different kinds of medium.

Business data are a resource of the enterprise and like any resource require management, operations (including maintenance), standards, ownership and monitoring. These requirements can also generate needs for business systems (see **4.3.3**) or functional qualities of business systems (see **4.5**).