

**Guidelines for enhancing the capability to explain software quality  
for products and systems in regards to safety and reliability  
(Guidelines for implementing software quality explanation scheme)**

First Edition

June 2013



The translated version of formal document (Japanese in June 2013, First Edition) for reference.

“Guidelines for enhancing the capability to explain software quality  
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(Guidelines for implementing software quality explanation scheme)”

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## INTRODUCTION

Currently, equipment and services that employ software are indispensable to everyday life and part of the very fabric of society. Given the increasingly important role of software in IT (Information Technology), software defects can lead to device failures or service interruptions that in turn can have the major impact on society.

In March 2010, the 13th meeting of the Information Services and Software Subcommittee of the Information Economy Committee of the Industrial Structure Council released recommendations on the introduction of third-party verification to provide a more visible form of reliability. The Information-technology Promotion Agency (IPA) has been deliberating on concrete strategies to this end.

Greater utilization of IT is seen as pivotal to promoting the growth of existing industries while also stimulating the creation of new industries. At the same time, the rights of users<sup>1</sup> in an advanced IT society should be protected. Suppliers of products and systems should strive to ensure that increasingly advanced and complex products and systems have appropriate quality. They also should provide users with a sufficient explanation of quality, particularly regarding reliability. Users, meanwhile, should access and read through the relevant quality-related information.

To this end, suppliers are expected to release proper and reliable information in a form that is easily understandable to users. These Guidelines represent study result on an investigation into a framework of a scheme designed to allow a third party to verify the explanation of quality forwarded by the supplier and provide this information to the users of the product or system.

The term “software quality explanation” refers to an explanation provided by the supplier to the users of a product or system in which software plays an important role, that enables the users to identify and interpret the quality of the product or system. The effectiveness of the explanation in describing the quality of the software is called the “capability to explain software quality”. The software quality explanation describes the following aspects and characteristics of the product or system:

1. The assumed type of users of the product or system, along with the purpose of use, manner of use and usage restrictions
2. The required quality and its objectives of the software with regard to the situation when the user uses the product or system
3. Design, implementation, operation and maintenance requirements for achieving the quality objectives
4. Verification and audit of achievement of quality objectives

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<sup>1</sup> *Guidance on Social Responsibility* (ISO 26000:2010 (JIS Z 26000:2012)) contains the stipulations on consumer protection.

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Enhancement of the capability to explain software quality encompasses several aspects of the development and operation of software by the supplier: the technical aspect of ensuring that the expected quality standards are met; the administrative aspect covering the entire life cycle of the product or system; and the institutional aspect of evaluating the two other aspects.

These Guidelines describe the institutional aspect, which is the approach to constructing a framework that enables a third party to confirm the adequacy of quality explanations. Specifically, the third party, acting on behalf of users, evaluates from an objective and expert perspective the adequacy of the quality explanation, and provides the results in a form that is easily understandable to users.

Fair, equitable and continuous operation of the scheme will encourage users to place greater trust in quality explanations while promoting the selection and usage of products tailored to various users' demands, in turn improving safety by reducing the number of accidents. Suppliers, meanwhile, will benefit from greater trust from customers and from society, enhancement of their brands, and reduced business risks particularly with respect to product accidents.

These Guidelines stipulate the basic requirements that the scheme should deliver, and are intended for use by organizations and associations (including industry associations and governmental bodies) that are interested in setting up a scheme of the type outlined above.<sup>2</sup> The Guidelines are intended for organizations and associations that would be responsible for planning, implementation and operation of the scheme and that are seeking to:

- Provide fair and impartial information on safety and security to gain the trust of users
- Set up a framework to promote distribution of good quality products
- Put in place an objective set of criteria for product explanations in areas lacking in international standards or regulations
- Ensure accountability for quality in the event of failures

Where different schemes are set up in different product and system domains, ideally all schemes should have the same basic objectives, fundamental principles, scheme design and methodology to perform, in order to make it easier for users to understand. These Guidelines summarize the key requirements designed to ensure that third party explanations of quality and its statement given by a supplier are easy for users to understand, and sets out the principles of the scheme design to this end. The aim is to ensure compatibility among different product and system domains.

These Guidelines are designed to promote consideration of the importance of accountability to users, thereby contributing to the realization of a safe and secure IT society.

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<sup>2</sup> The decision about whether or not to set up a system will be made by the individual organization or association in accordance with factors such as the product or system domain and the circumstances in the industry.

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These Guidelines are configured as follows.

- Chapters 1 to 3 define the terminology and describe the basic principles and methodologies of the scheme. They are designed to engender an understanding of the basic principles of the scheme and the methodology for setting up a scheme.
- Chapter 4 sets out the requirements of the scheme. It is designed to engender an understanding of the requirements of individually created schemes and serve as a checklist of requirements for use in the process of setting up a scheme.
- Chapter 5 covers other matters.

These Guidelines will be revised as and when necessary, taking into account the impact of such revisions on individual schemes, in accordance with factors such as: evaluation for performing individual schemes; feedback from the scheme owners as well as suppliers and users and others; revision and/or publication of international standards and equivalent; and trends in technology.

## 1. TERMINOLOGY

The following terminology is used in this document.

- **Product:** A software product, or a device that incorporates software, or a service that uses the software and/or the device.
- **System:** A combination of multiple products designed to provide certain functions or features.
- **Supplier:** The entity providing the product or system. Also known as the first party.
- **User:** The entity using the product or system. Also known as the second party.
- **Independent/independence:** Where an organization (or personnel) is not financially or mentally dependent on another organization (or personnel).
- **Third party:** An organization (or personnel) that is independent of users and suppliers.
- **Fairness:** Where decisions and/or processes are not biased in any way.
- **Individual scheme:** An individual scheme set up in accordance with these Guidelines. Also referred to simply as a “scheme” where it clearly qualifies as an individual scheme.
- **Scheme owner:** The organization responsible for planning, design, operation and improvement of an individual scheme.
- **Scheme component:** An organization responsible for planning, design, operation and improvement of an individual scheme that is not the scheme owner.
- **Assessment:** The process of evaluating conformance with requirements by collating documents, statements of fact and other information for the purpose of objective evaluation. Includes assessment of documents, assessment of the product or system, testing and verification, on-site assessment and interviews.
- **Assessment criteria:** Criteria used for assessment.
- **Verdict:** A decision based on the assessment results that is used to determine whether a product or system or supplier satisfies the requirements of the individual scheme.
- **Verdict result:** The decision resulting from the verdict.

## 2. BASIC PRINCIPLES

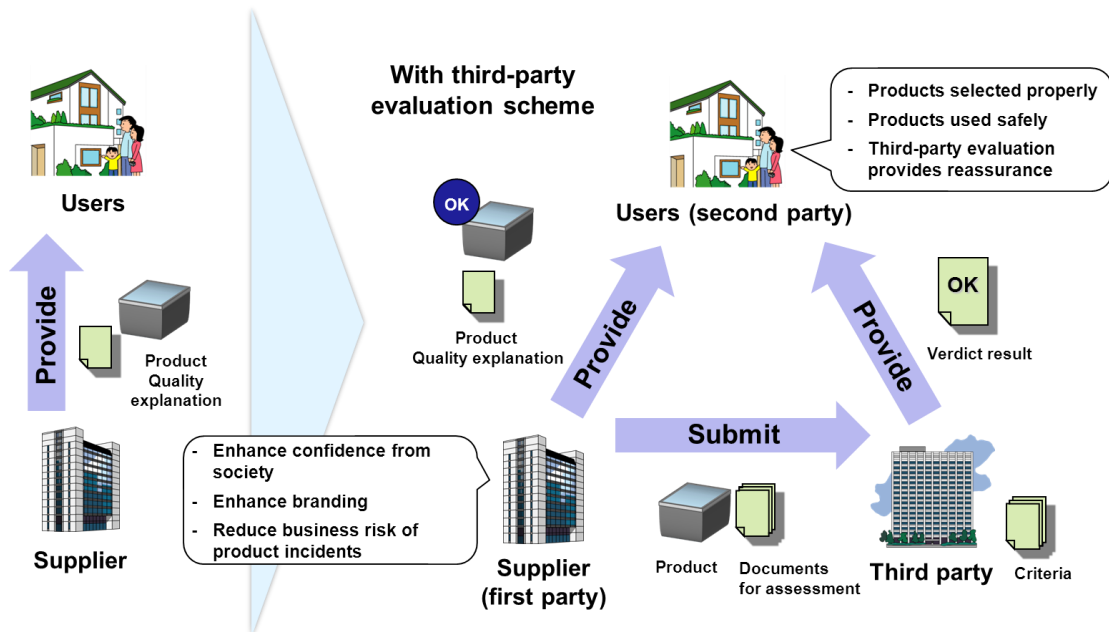
Chapter 2 describes the basic principles of the software quality explanation scheme.

The basic principles are outlined below.

**The software quality explanation scheme involves evaluation by a third party with reference to criteria of the adequacy of the explanation provided by the supplier of a product or system to the users of the product or system, concerning the quality of software which performs key functional roles in the product or system - particularly the reliability and safety of the software - and the provision by the third party and the supplier of the results of such evaluations to users in easily understandable form.**

- Evaluation by a third party with reference to criteria  
The third party evaluates the adequacy of the quality explanation for the product or system with reference to criteria such as the assessment criteria. Since aspects such as technology differ among product and system domains, criteria are developed individually for each individual scheme. If there is an international standard applicable to the product or system domain or to quality covered by the relevant scheme, the international standard is used. Where there is no international standard, especially in advanced technology fields, new criteria are developed.
- Adequacy of the explanation  
The supplier accurately ascertains the quality aspects that need to be explained to users and performs the necessary design, implementation and verification processes to achieve these quality aspects. The supplier provides users with a full and proper quality explanation in order to prevent potential misunderstandings. Where a product or system is likely to be used by persons with no technical or specialist knowledge, an explanation of terminology and/or simpler wording may also be required. Explanations should be predicated on substantive facts such as design documents and verification results.
- (Quality in terms of) the reliability and safety of the software  
This is envisaged to include safety, reliability, information security and other aspects of reassurance to users.
- Results of such evaluations to users in easily understandable form  
The third party and the supplier provide evaluation results to users in easily understandable form. This information is used by users to select products or systems and to evaluate the quality of products or systems they are already using. For example, the third party can list verdict results on a website that is accessible to users, and suppliers can use a readily identifiable mark to display evaluation results on products or systems and in catalogs.





**Figure 2-1 Basic Concepts**

Following paragraphs explains the changes that the introduction of such a scheme would bring about from the point of view of suppliers and users.

The left-hand side of Figure 2-1 depicts the conventional situation, where the supplier provides the users with a product or system and provides information about the functions and quality of the product or system in a catalog, on a website, or with a similar measure.

The right-hand side of Figure 2-1 shows how the introduction of the scheme alters the framework between these two parties. The supplier provides the product along with documentation such as design documents to a third party. The third party evaluates these with reference to criteria in order to assess the adequacy of the quality explanation provided by the supplier via assessment and verdict processes. The verdict result (i.e., whether the explanation is adequate or not) is notified by the third party to users. The supplier also displays the verdict result on the product to notify users. This approach delivers the following benefits to users:

- Promotes appropriate selection of products and systems
- Allows users to be informed about the quality of products and systems and the intended use of products and systems, thereby promoting proper and safe use of products and systems
- Provides users with reassurance in the use of products and systems that have been evaluated by a third party that is independent of the supplier

It also has the following benefits for suppliers:

- Boosts trust from society in their products and systems
- Enhances the supplier brand
- Promotes correct usage of products and systems by users, thereby reducing the risk of product accidents
- Enables suppliers to provide objective quality explanations in new domains prior to the advent of international standards

In order to implement this framework in a manner that is fair, continuous and easy for users to understand, it is effective to make it a scheme that is widely recognized in society.

Figure 2-2 shows an example of how the scheme could be configured. Firstly, the organization that creates the scheme (called the scheme owner) plans the scheme. Figure 2-2 gives an example of planning of a “scheme where in some product domain, a third party verifies safety aspects of quality and permits an “OK” mark to products where the quality explanation from the supplier is deemed to be adequate.”

The supplier submits an application to use this scheme and is subsequently notified of the results. If the result is OK, the supplier is permitted to display OK mark on the product. This differentiates the product from others that do not bear the OK mark, and helps users to make a more informed choice when selecting a product from among multiple products.

In order to ensure fairness in the operation of the scheme, it is important that suppliers and users of the relevant products and systems, as well as wider society in general, are able to access information about the scheme in general and the assessment criteria in particular. To this end, the scheme owner releases details of the scheme including the assessment criteria.

For users, it is important to know what kind of products and systems covered by the scheme, as well as the quality and the method of evaluation. If the users do not have a correct understanding of the scheme, they will not appreciate the meaning of the verdict results for products and systems, and they will not be able to enjoy the benefits listed above. Thus, the scheme owner should, as far as practicable, strive to explain the details of the scheme in a manner that is easy for users to understand.



**Figure 2-2 Sample Scheme**

The scheme owner is responsible for soliciting feedback and suggestions from suppliers, users and a wide range of relevant parties, and implementing modifications as necessary for the purpose of continuous improvement of the scheme.

### 3. INDIVIDUAL SCHEMES

Chapter 3 describes the methodology of developing an individual scheme.

#### 3.1. SCHEME OWNER AND SCHEME COMPONENTS

The scheme owner is responsible for the planning, design, operation and improvement of the individual scheme. The scheme owner may engage the services of other organizations for tasks that require specialist knowledge or independence. Such organizations are called “scheme components” in these Guidelines.

In the example in Figure 3-1, scheme components with specialist knowledge in the product domain are given the tasks of determining the assessment criteria, performing assessments and delivering verdicts within the scheme shown in Figure 2-2.

In order to ensure the fairness of the scheme, it is important that the scheme components are independent of both the scheme owner and the supplier. This is particularly important if the scheme owner is an industry association in the relevant product or system domain. In Figure 3-1, the review body (the entity that reviews the scheme to determine whether it is being operated properly) is also a scheme component, for the purpose of independence. Section 3.4 below discusses the independence of the scheme components.

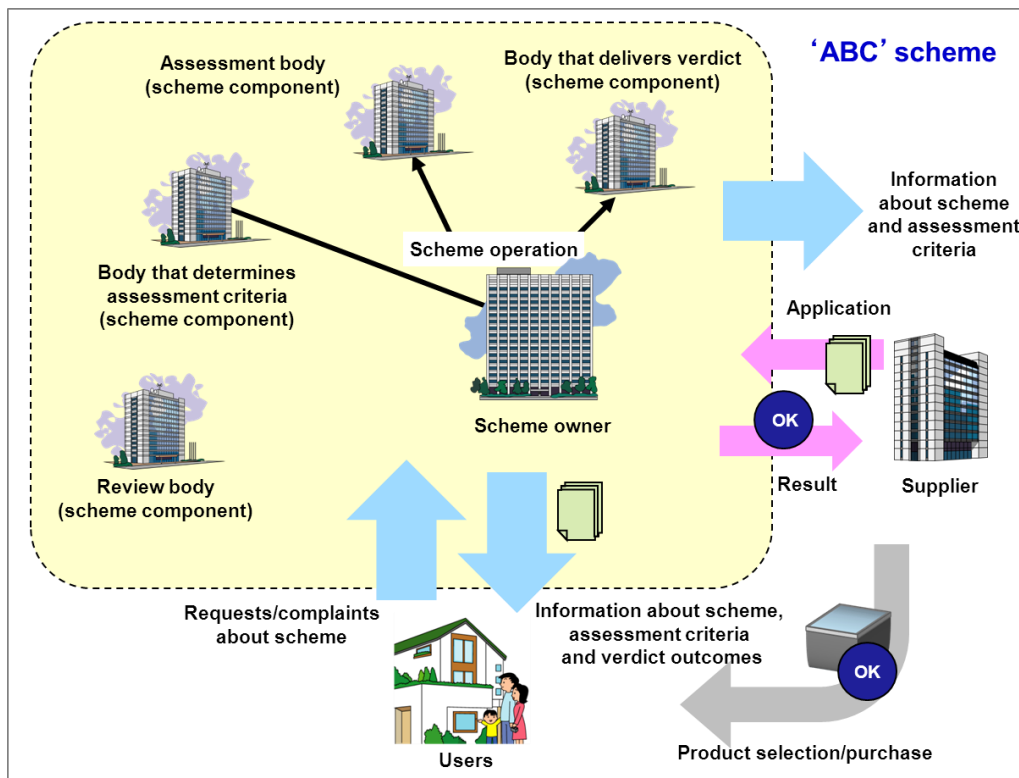


Figure 3-1 Example of Usage of Scheme Components

### 3.2. ROLE OF THE SCHEME OWNER

This section describes the role of the scheme owner. The scheme owner is responsible for planning and designing the scheme, and for working with the scheme components on the operation and improvement of the scheme. The scheme owner should ideally strive to develop a scheme that not only fulfills the requirements of these Guidelines (as outlined in Chapter 4) but is also beneficial to wider society.

1) Planning the scheme

The scheme owner sets out the objectives of the scheme, the target products and systems, and the scope of quality to be covered by the scheme. The scheme owner also identifies all stakeholders and seeks their input into the planning process.

2) Designing the scheme

The scheme owner designs the scheme and ensures that there are sufficient resources to operate the scheme, including the necessary organization and personnel as well as financial and technological foundations. The scheme owner also sets up structures for the operation and management of the scheme.

Processes involved in designing the scheme include: investigating the functions required of the scheme; determining the scheme components; defining the assessment criteria; designing the procedures involved at all stages of the life cycle of the scheme from commencement to operation, maintenance and termination; defining the method of operation; conducting a feasibility study; and documenting the above in the form of, for example, scheme regulations and scheme operating regulations. The scheme owner is responsible for making the information about the scheme, including assessment criteria, publicly available.

3) Operating the scheme

The scheme owner is responsible for overall maintenance and management of the scheme, and for ensuring that the scheme is operated in a fair manner by providing information about the scheme components, verdict results and other details to users, suppliers and other stakeholders.

The scheme owner is responsible for operating the scheme in accordance with the method of operation defined at the design stage, and also for the operations of the scheme components.

The scheme owner strives to promote and encourage usage and understanding of the scheme through appropriate awareness and educational activities targeted primarily at suppliers and users.

4) Modifying and improving the scheme

The scheme owner addresses any imperfections or deficiencies in the scheme by making improvements where necessary. The scheme owner also provides a mechanism for collecting feedback on the scheme from users, scheme components, suppliers and other stakeholders, and uses the feedback to implement improvements where necessary.

### 3.3. RESPONSIBILITIES OF THE SCHEME OWNER

This section gives further detail of the responsibilities of the scheme owner with respect to planning, design, operation and improvement of the scheme.

#### A) PLANNING

- 1) Set up the objectives and scope (products and systems, quality aspects) of the scheme.
- 2) Determine whether the scheme is likely to be accepted by society, based on social expectations such as increasing users' concern regarding product accidents and potential trade issues as well as the needs of users, suppliers and the industry. Identify the benefits of the scheme to users, suppliers and society, as the basis for reviewing the scheme and improvements thereto.
- 3) Set up a mechanism for collating and analyzing information from a wide range of sources including complaints regarding the quality of products and systems, market appraisals, found issues, and reports of accidents and hazards.

#### B) DESIGN

- 1) Determine the allocation of operational roles for the scheme among the scheme components and define the responsibilities of each scheme component (see Section 3.4).
- 2) Select the organizations to act as scheme components.
- 3) Define the assessment criteria (see Section 3.5).
- 4) Define detailed scheme operation procedures.
- 5) Investigate the feasibility of the scheme through a trial run, pilot operation or equivalent.
- 6) Make the information about the scheme including assessment criteria publicly available.

#### C) OPERATION

- 1) Operate the scheme in accordance with the operation procedures defined in the design phase.
- 2) Engage an independent organization (one that is independent of the scheme owner and the bodies involved in operation of the scheme) to review the operation of the scheme on a regular basis and make the results of said reviews publicly available, as a means of ensuring that the scheme is effective.
- 3) Address any imperfections or deficiencies in the scheme, as well as operational issues.
- 4) Liaise with stakeholders in order to obtain feedback such as complaints and suggestions.
- 5) Monitor any changes to standards, laws and other reference documents utilized in the scheme.
- 6) Promote and encourage usage and understanding of the scheme through appropriate awareness and educational activities targeted primarily at users and suppliers.

#### D) CHANGE AND IMPROVEMENT

- 1) Institute changes and improvements to the scheme based on feedback from stakeholders and the results of regular reviews of the operation of the scheme.
  - 2) Modify the scheme as required in response to any changes to standards, laws and other reference documents utilized in the scheme.
  - 3) Notify stakeholders promptly of changes and modifications to the scheme.
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### 3.4. INDEPENDENCE OF SCHEME COMPONENTS

This section describes the principle of independence of the scheme components pertaining to their roles, in the context of the responsibilities of the scheme owner listed in section 3.3 above.

The scheme should be fair in order to win the trust of users and suppliers. To this end, the scheme owner should ensure that the scheme is operated in a fair manner. This extends to defining the scheme components involved in operation of the scheme and their respective roles. The design process involves deciding which scheme components (separate to the scheme owner) to use in which roles. For example, Figure 3-1 shows a scheme in which there is a scheme owner, a body that determines the assessment criteria, an assessment body, a body that delivers verdicts and a review body that evaluates whether the scheme is being operated properly.

It is particularly important that the assessment and verdict processes be seen to be fair. If society has concerns about the assessment or verdict results, then reliability in the scheme itself will be lost. In order to ensure the fairness of the assessment and verdict processes, it is important that the scheme components responsible for performing assessments and delivering verdicts be independent of suppliers so that they are not tempted to give priority to the interests of suppliers (see Figure 3-2). This independence is particularly important where the scheme owner is an industry association of which the suppliers may themselves be members.

Where it is not possible to guarantee the independence (relative to suppliers) of the bodies responsible for performing assessments and delivering verdicts, it may be necessary to set up within the organization a committee of academics and experts that operates independently of the normal operation of the scheme. For example, where the scheme owner is an industry body with suppliers as members, the scheme owner would set up a Verdict Committee within the organization with responsibility for delivering verdicts (see Figure 3-3).

In addition, to ensure fairness of operation it is important to engage an organization that is independent of the scheme owner, the scheme components and suppliers to evaluate the operation of the scheme through a regular review process and make the results of said reviews publicly available.

Where it is not possible to guarantee the independence of the review body from the scheme owner, other scheme components and suppliers, it may be necessary to set up within the organization a committee of academics and experts that operates independently of the normal operation of the scheme (in the same way as for the body responsible for delivering verdicts above).



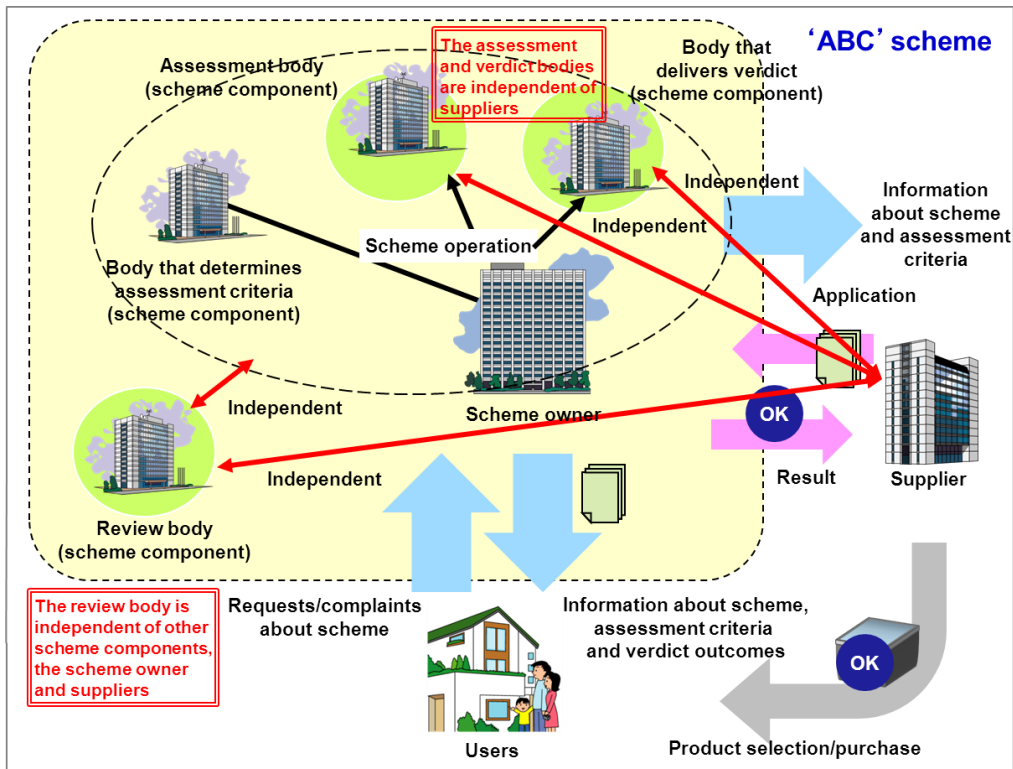


Figure 3-2 Ensuring Independence of Scheme Components

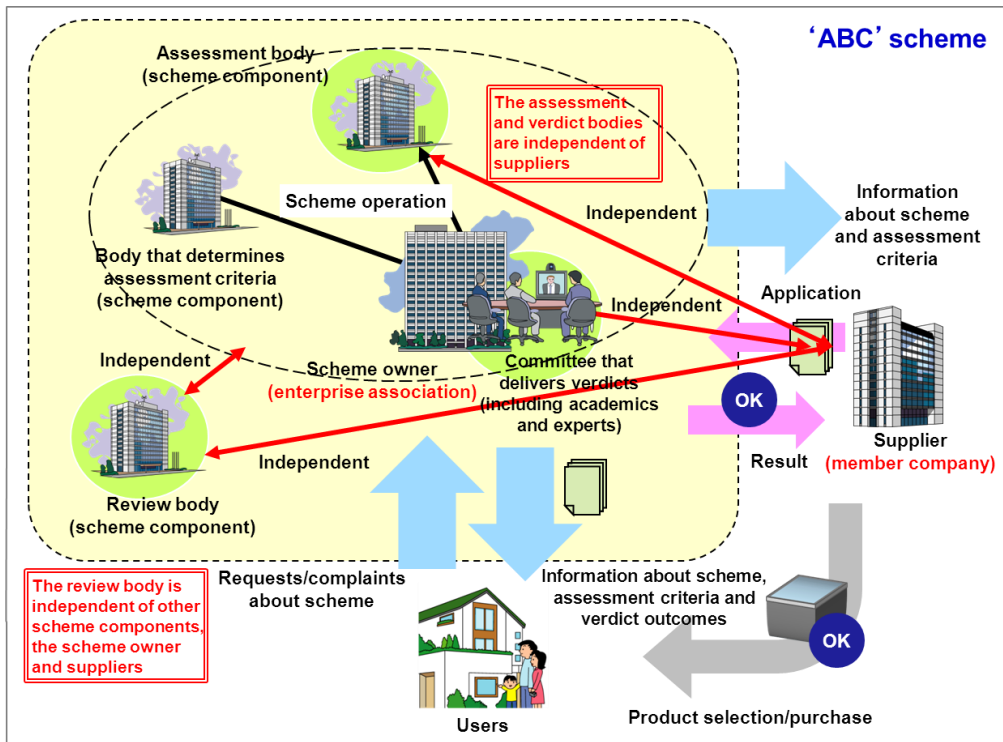


Figure 3-3 Independence of Committee Model

Once the scheme components have been defined at the design stage, the next step is to select the actual organizations to serve as the scheme components. It is important that each selected organization possesses the required specialist knowledge and capabilities to perform their allocated roles. Here, “capabilities” refers to the specialist skills and technical capability required to perform the role of the scheme component within the scheme, as well as quality control over administrative procedures and processes (particularly in relation to accuracy and efficiency) and governance systems for information security management (including delineation of responsibilities). The scheme owner takes all of these into consideration when defining the requirements of the scheme component.



### 3.5. Assessment Criteria and Assessment Process

This section describes assessment criteria and the formulation thereof; principles regarding the impact of product and system defects that are relevant to assessment; and items to be conducted pertaining to the practice of assessment.

#### A) BASIC PRINCIPLES OF ASSESSMENT CRITERIA

The assessment criteria constitute the basis for assessment, and are used by the assessment body to assess the quality aspects of products and systems.

The assessment criteria should normally be formulated with reference to established international standards such as ISO (International Organization for Standardization) and IEC (International Electrotechnical Commission) or domestic standards such as JIS (Japanese Industrial Standards) in the relevant product or system domain.

Standards such as ISO, IEC and JIS apply a given order to products and systems, as well as to the manufacture and/or usage thereof, with the aim of minimization and simplification. ISO and IEC are well-established and accepted standards in the international arena, while JIS is similarly established within Japan. Conformance or compliance with these standards can thus be considered proof that a product or system has attained a given standard of quality, which is directly relevant to the assessment process.

Some products and systems may be covered by criteria or specifications other than ISO, IEC or JIS which have been independently developed by industrial associations or groups in the relevant product or system domain. Such criteria and specifications may be incorporated into the assessment criteria where appropriate.

#### B) FORMULATION OF ASSESSMENT CRITERIA

The formulation of assessment criteria should take the following into consideration.

- 1) The parties involved in formulating the assessment criteria should take the following into consideration:
  - Changes and advances in the technology employed in the product or system
  - Information obtained from the scheme owner, scheme components and suppliers
  - Information obtained from users in regards to convenience and failures
- 2) The assessment criteria should conform to all applicable treaties, conventions, laws and regulations.
- 3) The assessment criteria should be based on the following standards (in order of priority):
  - Established standards such as ISO, IEC and JIS.  
Where there exists certification bodies for the particular standard, the results of the body's assessment may be substituted in place of the relevant portion of the assessment process.
  - Criteria that are not based on standards should be demonstrably fair.

- 4) The assessment details should be designed based on the scope of the target product or system and the scope of the quality.
- 5) The assessment details should require reasonable cost considering the scope of the target product or system and the scope of the quality.
- 6) The assessment criteria should be clearly codified in concrete detail.
- 7) In light of the influence of the assessment results on the verdict, if there exists a recommended assessment methodology for a particular assessment process, this should be stated.

**C) IMPACT LEVEL**

The risks associated with product or system defects or misuse can be evaluated in terms of impact level using a pre-defined scale that indicates the negative health or other impacts on users (such as injury or death) and the negative impacts on property and/or society (such as economic losses).

Performing the assessment process in accordance with impact levels enables the design of a scheme that is more economically efficient for both users and suppliers. The procedure for defining impact levels is based on the following references.

- 1) Impact levels are defined with references to the principles of standards that stipulate levels. For example, examples of such standards include the ASIL (Automotive Safety Integrity Level) (ISO 26262-9: 2011), the SIL (Safety Integrity Level) (IEC 61508-5: 1998), the Software Safety Classification (ISO/IEC 62304: 2006) and the Evaluation Level (ISO/IEC 14598-5: 1998, annex B).
- 2) Level definitions for target products and systems are based on the principles illustrated in Figure 3-4. Assessment involves determining which level the product or system corresponds to. Where the product or system corresponds to different levels from different viewpoints, the highest level is chosen.

**Negative impact on users**

Impact level	Scope/severity of impact
4	<ul style="list-style-type: none"> <li>· Major impact on relevant users and others</li> <li>· Widespread major impact on users and others</li> </ul>
3	<ul style="list-style-type: none"> <li>· Major impact on relevant users and minor impact on others</li> </ul>
2	<ul style="list-style-type: none"> <li>· Major impact limited to relevant users</li> </ul>
1	<ul style="list-style-type: none"> <li>· Minor impact limited to relevant users</li> </ul>
0	<ul style="list-style-type: none"> <li>· Negligible impact/no impact</li> </ul>

**Negative impact on property/society**

Impact level	Scope/severity of impact
4	<ul style="list-style-type: none"> <li>· Widespread impact on industry</li> </ul>
3	<ul style="list-style-type: none"> <li>· Impact limited to relevant industry</li> <li>· Impact on similar/related industries</li> </ul>
2	<ul style="list-style-type: none"> <li>· Impact limited to relevant enterprise</li> <li>· Impact on other products/operations</li> </ul>
1	<ul style="list-style-type: none"> <li>· Impact limited to relevant product/service</li> </ul>
0	<ul style="list-style-type: none"> <li>· Negligible impact/no impact</li> </ul>

**Product impact level is the higher of the two above**

**Figure 3-4 Examples of Impact Levels**

## D) ITEMS TO BE PERFORMED FOR ASSESSMENT

The assessment body items to be performed are listed below.

- 1) Processing the following declarations submitted by the applicant (normally the supplier), including checking suitability.
  - Target product or system and quality objectives for target product or system  
Identify the target product or system and define the required quality objectives of the product or system.
  - Assumed users of target product or system, assumed purpose of use, assumed manner of use, restrictions, etc.  
Determine the assumed type of user of the product or system to be assessed along with the manner and purpose of use, and identify any applicable usage restrictions.
  - Impact level corresponding to impact associated with defects in the target product or system, for establishing impact levels for the scheme  
Determine which of the pre-defined impact levels represents the impact that would be caused by a defect in the product or system to be assessed in the event of such a defect.
- 2) Defining the details of the applicable assessment process and assessment methodology (such as sampling methods and/or evaluation techniques) in accordance with the requirements of the scheme.  
Where highly specialized product technology and/or highly specialized verification technology is required, determine whether the organization is capable of performing such assessment, and if not, make the decision to engage the services of another verification organization.
- 3) Drawing up an assessment plan.
- 4) Checking and acknowledging receipt of the targets of the assessment and the evidence materials and documentation used in the assessment.
- 5) Performing the assessment (includes assessment of documents, assessment of product or system, testing and verification, on-site assessment and interviews).
- 6) Making a report on assessment results.

## E) ADMINISTRATION OF ASSESSMENT CRITERIA

The assessment criteria are subject to appropriate version control, with a liaison structure for notifying the relevant parties promptly in the event of amendments and information about implications for the results of assessments performed using previous versions of the assessment criteria (including the validity of certificates). The assessment criteria are made publicly available, with feedback on such information being incorporated into future amendments of the assessment criteria where appropriate. Assessment criteria are subject to continuous improvement, including regular amendments in line with the stipulations of the scheme.

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## 4. REQUIREMENTS OF INDIVIDUAL SCHEMES

Chapter 4 details the requirements of individual schemes. Schemes that are based on these Guidelines shall satisfy the requirements outlined hereunder. Scheme owners should strive to develop schemes that are of genuine use to society in addition to satisfying the requirements.

### 4.1. BASIC REQUIREMENTS

Table 4-1 lists the basic requirements of schemes.

**Table 4-1 Basic Requirements of Schemes**

Item No.	Category	Item	Requirement
B-01	General principles	Target (product/system)	The target shall be products and systems in which software is used to provide the main functional role.
B-02		Target (quality)	The target shall be the quality of products and systems, with respect to the users' trust in the product/system and the safety and security of usage.
B-03		Third party assessment and verdict	The scheme shall involve assessment (including technical verification) and verdicts by a third party.
B-04		Publication of verdict results	The verdict results (on product and system quality) shall be provided to users at any time in easily understandable form.

## 4.2. REQUIREMENTS OF SCHEME OWNERS

Table 4-2 lists the requirements of the scheme owners.

**Table 4-2 Requirements of scheme owners**

Item No.	Category	Item	Requirement
E-01	Organization	Qualifications	The scheme owner shall be a legal entity.
E-02		Managerial resources	The scheme owner shall possess the necessary managerial resources (staff, assets, funding) for proper operation of the scheme.
E-03		Responsibility	The scheme owner shall establish a chain of responsibility in relation to operation of the scheme.
E-04	Planning and design	Design of scheme formation	<p>The scheme owner shall investigate the required functions of the scheme then define the associated organizational and staffing requirements. The functions include the following:</p> <ul style="list-style-type: none"> <li>• Formulating, modifying and managing assessment criteria</li> <li>• Performing assessments Technical verification (where required as a means of assessment)</li> <li>• Delivering verdicts</li> <li>• Conducting reviews of the scheme</li> </ul> <p>The entity or entities responsible for performing assessments and delivering verdicts shall be independent of the suppliers.</p> <p>The entity responsible for reviewing the scheme shall be independent of the scheme owner and scheme components as well as the suppliers.</p>
E-05		Formulation of scheme regulations	The scheme owner shall formulate the provisions necessary to the operation of the scheme and document same.

Item No.	Category	Item	Requirement
E-06		Construction of scheme formation	The scheme owner shall construct a scheme formation and ensure the availability of the required personnel and other resources. Where organizations that are not the scheme owner are engaged as scheme components in the scheme, the scheme owner shall choose the organizations.
E-07		Development of assessment criteria	The scheme owner shall formulate and document the assessment criteria (except where this is performed by a scheme component).
E-08		Self-conformity assessment	The scheme owner shall monitor and verify conformity of the scheme to these Guidelines and release information on same as described in Chapter 5, <i>Compliance with the Guidelines</i> .
E-09		Public release of scheme regulations and assessment criteria	The scheme owner shall make the details listed in Section 4.3 publicly available.
E-10		Risk assessment	The scheme owner shall conduct a prior evaluation of the risks associated with practice of the scheme that has been planned and designed.
E-11		Determining the method of review of the scheme	The scheme owner shall determine the method used to conduct an objective review of the scheme to ascertain whether it is fulfilling its objectives with reference to the basic requirements of the scheme.
E-12		Operation and improvement	Operation management and supervision

Item No.	Category	Item	Requirement
E-13		Maintaining capability	The scheme owner shall take all necessary measures to maintain the capability of the functions performed by the scheme components during operation of the scheme.
E-14		Management of risks associated with practice	The scheme owner shall manage risks arising in connection with practice of the scheme, for example, the impact on users of improper usage of the mark.
E-15		Explanation of scheme to users and suppliers	The scheme owner shall explain details of the scheme to users, suppliers and other stakeholders in an easy to understand form.
E-16		Information gathering	The scheme owner shall gather information about technology trends and failures in products and systems as well as feedback from users, suppliers and scheme components.
E-17		Improvement of scheme and assessment criteria	The scheme owner shall use the information described above to make improvements to the scheme and assessment criteria where required.

### 4.3. PUBLIC RELEASE OF SCHEME REGULATIONS

Table 4-3 lists those details of schemes based on these Guidelines that shall be made publicly available. Where the words “where applicable” appear, this means that public release of details is only required where the item is applicable.

Note that items other than those listed in Table 4-3 that are deemed to be operationally necessary by the scheme owner may be included.

**Table 4-3 Scheme Regulations to be Made Publicly Available**

Item No.	Item name	Description
<b>Basic items</b>		
R-01	Name of scheme	The name of the scheme.
R-02	Objectives	The objectives of the scheme, including the significance of the scheme to users and to suppliers.
R-03	Scope	The scope of industries, products and systems covered by the scheme, and the scope of quality.
R-04	Contact for inquiries in relation to the scheme	Contact details for inquiries, to enable a response to general inquiries about the scheme.
<b>Items related to assessment</b>		
R-05	Designation of assessment criteria	The assessment criteria used for assessment.
<b>Items related to verdicts</b>		
R-06	Verdict method	The method used to reach verdicts on the basis of assessment results and other relevant information.
R-07	Validity of verdict results	The period of validity of the verdict result (where applicable). Also indicates the validity of prior verdicts with respect to subsequent variations, version upgrades or customization.
R-08	Handling of verdict results	How the verdicts are handled, including the method of publicizing the results, the method of notifying applicants, whether re-assessment is permitted, and the scope of responsibility with respect to the results.
R-09	Rescinding a verdict result	The conditions or requirements for rescinding a verdict result and the associated handling thereof, including the method of alerting users and the method of notifying applicants.



Item No.	Item name	Description
<b>Items related to outsourcing of tasks to scheme components</b>		
R-10	Requirements of scheme components (where applicable)	The requirements of each scheme component (organization or personnel different to the scheme owner) that is engaged to perform a function of the scheme.
R-11	Contracts with scheme components (where applicable)	The principles of a legally binding contract between the scheme owner and a scheme component (organization or personnel different to the scheme owner) that is engaged to perform a function of the scheme, stipulating the duties and responsibilities of each party.
<b>Items related to displays and notifications</b>		
R-12	Method of public release of verdict results	The method of public release of the verdict results.
R-13	Details of certificates and equivalent	Details required on certificates and other documents that certify the verdict results for products and systems and in verdict results released in public, including lists of affected products and systems.
R-14	Certificate and mark license requirements (where applicable)	The requirements by which a scheme owner consents to the use of a certificate and/or associated mark by a supplier on the supplier's product or system.
R-15	Mark license management method (where applicable)	Where consent has been granted for use of a mark, the requirements pertaining to mark ownership rights and management of usage and details of the consent agreement. Also, the means by which users can access information about the verdict result on which the mark is based.
R-16	Method by which suppliers refer to the scheme in publicly available materials	Requirements by which suppliers may refer to the scheme in publicly available material, including the contents of the scheme that may be referred to and any limitations.
<b>Items related to operation of the scheme</b>		
R-17	Criteria and procedures via which suppliers utilize the scheme	The prerequisite conditions under which suppliers may utilize the scheme, as well as criteria and application procedures.

Item No.	Item name	Description
R-18	Response to claims of applicants with fraudulent verdict results	Guidelines for responding to fraudulent claims by assessment applicants (or others) of an verdict result (normally involving recognition/rejection), and responsibility for response.
R-19	Handling of changes to aspects of the verdict result such as the effectiveness conditions (where applicable)	<p>Handling of changes to aspects of the verdict result such as the effectiveness conditions. The responding cases include the following:</p> <ul style="list-style-type: none"> <li>• Updating the validity period of the verdict result (where applicable)</li> <li>• Rescinding a verdict result for reasons such as violation of the contract of license for use of the mark or where the provision of the product or system has concluded</li> <li>• Affording special dispensation to a system made from a combination of products and systems that have already been given verdict results</li> </ul>
<b>Management of inquiries</b>		
R-20	Processing of inquiries about the scheme	Procedures for complaints and statements pertaining to the scheme and its operation and designation of the party or parties with responsibility for said procedures.
R-21	Processing of inquiries about verdict results	Handling of inquiries about verdict results and information about doubts.
<b>Information management</b>		
R-22	Information management methods	Principles of management of information held by the scheme owner and scheme components (including types of information, period of retention, responsibility for possession and information disclosure). The period of retention should be long enough in respect of the life cycle of the product or system.

## 5. COMPLIANCE WITH THE GUIDELINES

The scheme owner of an individual scheme formulated in accordance with these Guidelines shall provide information about the scheme publicly e.g. on the scheme owner's website, or on an explanatory website set up for the individual scheme, to ensure that such information is easily understandable to users of the relevant products and/or systems. One of the following contents should be stated:

This scheme complies to the *Guidelines for enhancing the capability to explain software quality for products and systems in regards to safety and reliability (First Edition)* released by the Information-technology Promotion Agency, Japan in June 2013.

or

This scheme complies to the *Guidelines for implementing software quality explanation scheme (First Edition)* released by the Information-technology Promotion Agency, Japan in June 2013.

## **INQUIRIES IN RELATION TO THE GUIDELINES**

Inquiries in relation to these Guidelines should be emailed to following address.

Email address for inquiries: [sec-qag@ipa.go.jp](mailto:sec-qag@ipa.go.jp)

Guideline for implementing software quality explanation scheme Department  
Software Reliability Enhancement Center Technology Division  
Information-technology Promotion Agency, Japan

Please be aware that responses may take some time.

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