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Software Engineering  
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## SC7 Strategic Direction

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### 1. Executive Summary

Software has become an integral part of society's infrastructure, and it is growing in importance.

The complexity of software and software based systems is growing, but the practices to develop the software have not kept pace with that growth. There is an increased need to support the engineering of software through standardisation.

In a strategic planning workshop held during the 1997 Plenary meeting, SC 7 identified a number of problems which were attributed to the lack of:

- a coherent plan that establishes the products being developed and their user benefits
- an efficient management system for the conduct of business
- control over resources
- user involvement in defining requirements, initiating projects, standards development and measurement of success
- vision, mission and policies

Five major strategies were identified to provide improvements over the next five-year period:

- 1 Develop a framework with characteristics that ensure the development of a cohesive and coherent set of standards.
- 2 Define a management system that introduces necessary improvements in the management processes to meet time to market, co-ordination and resourcing demands.
- 3 Develop and implement practices which (increase) maximise user involvement.
- 4 Develop and implement management practices that better utilize scarce volunteer resources.
- 5 Publish and maintain an SC7 Strategic Direction document to provide a high level focus for the activities of SC 7.

As a result of these strategic planning activities, SC7 has developed this Strategic Direction document that is complementary to the Vision of ISO and to the SC 7 Terms of Reference.

## SC7 Strategic Direction

### 2. SC 7 Terms of Reference

Standardisation of processes, supporting tools and supporting technologies for the engineering of software products and systems.

**Note:** These processes, tools and technologies are within the scope of the JTC1 Terms of Reference and exclude specific tools and technologies that have been assigned by JTC1 to other of its SC's.

### 3.

*A unified set of software engineering standards widely accepted by the intended class of users.*

These standards will be organized in a framework, which establishes the relationships among SC 7 standards and between SC 7 standards and those of other disciplines, e.g. engineering, information technology, and quality management.

### 4. SC 7 Core Purpose and Values

#### 4.1 SC 7 Core Purpose

SC 7 exists to:

- Provide quality software engineering standards that meet user needs in broad markets.
- Manage the set of standards effectively through documented framework.
- Promote the use of standards by providing supporting materials.
- Provide leadership in software engineering standardisation through a framework that minimises the inconsistencies between major software related standards including those developed by other standard producing organizations.

#### 4.2 SC7 Core Values

- Consensus
  - At an International level and with regards to software engineering best practice
- Full and open deliberation
  - Active involvement with related disciplines
- Informed participation
  - Awareness of the subject
  - Awareness of JTC1 procedures
  - Awareness of project background

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- Equality and members/tolerance
    - At a minimum to follow JTC1 procedures
  - Commitment to quality
    - Maintain awareness of best practice and user needs
- Commitment of participants to the process
- Recognition of the importance of continuity in standards development
- Professionalism
    - Maintaining awareness of software engineering practices

### 4.3 SC7 Market Place

Software engineering standards must be focused on the needs of the users of those standards. Standards users at whom SC7 currently targets its work to include:

- Methods and tools suppliers
- Software and systems houses
- Corporate information system users
- Embedded software suppliers
- Software engineering educators and researchers
- Systems and software standards makers

## 5. SC 7's Major Strategies (Objectives) for the Period 1998-2002

### 5.1 *Develop a framework with characteristics that ensure the development of a cohesive and coherent set of standards.*

This framework will address the following specific needs:

- Technical direction
- Taxonomy
- Program of work
- Criteria to allocate priorities for new work
- Relationship amongst standards
- Cohesiveness
- Coupling

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The development of an SC 7 framework requires a broad consensus involving all member bodies and SC 7 leaders. To that end, the framework will be developed in a staged manner.

Strategy Major Item	Issues to be Considered
a. Define a draft framework	<p>Define boundaries of this framework to ensure flexibility to meet emerging needs.</p> <p>Define notation and conventions for describing framework. The initial notation and conventions to use Jim Moore's criteria/spec/class as a basis.</p> <p>Decide what value means to SC7 and how to put "value" on a new standard (relative value of the document).</p> <p>Show consistency with current product line:</p> <ul style="list-style-type: none"><li>• conventions for describing the SC 7 product line</li><li>• Conventions for titles of SC 7 standards and technical reports.</li><li>• Correlate existing and in-work SC 7 standards to existing software engineering body of knowledge (e.g., ACS, BCS, IEEE CS)</li></ul> <p>Decide applicable quality characteristics of SC7 standards.</p> <p>Define criteria for acceptability of a base document submitted as part of new work item proposal.</p>
b. Validate framework for: <ul style="list-style-type: none"><li>• Existing product line</li><li>• JTC1/ISO compliance</li><li>• Omissions</li><li>• Similar standards of other organizations</li></ul>	<p>Define "Top" key documents that SC7 needs</p> <p>Research JTC1 naming conventions for standards.</p> <p>Clarify how ISO uses KEY words in standards.</p>
c. Develop appropriate procedures for use by SC 7 to ensure framework is applied in all work of SC 7	<p>Develop principles that:</p> <ul style="list-style-type: none"><li>• Cut across various WGs.</li><li>• Prioritize work to bring cohesiveness and coupling to and amongst existing standards.</li></ul> <p>Procedures required are:</p> <ul style="list-style-type: none"><li>• "user" feedback mechanism</li><li>• prioritization task for each WG and NB</li><li>• objective criteria for evaluating new work items</li><li>• Criteria for Gap Analysis for potential new standards.</li></ul>
d. Define and adopt a quarterly reporting process	<p>Degree of effort has to be consistent with the significance of the project to SC 7 Strategic Direction.</p>

### Success Criteria

- Completion of framework with full mapping to Product Line

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- Initiation of new projects for gaps found in mapping the framework to product line
- Existing products and in-work projects not mapping to the framework being examined for usefulness and relevance to the users of SC7 standards.
- A framework that encourages flexibility to meet emerging needs

### 5.2 *Develop and Implement a Management System*

The management system will provide specific directions for SC 7 on:

- Time to market
- Internal/external coordination
- Consistency of product
- Regular/ongoing user involvement
- Effective method of conducting development work
- Forecasts/proactive about resource needs
- Organizational improvement

and incorporates (at a minimum):

- Plan
- Monitor
- Report
- Standards Life Cycle
  - JTC 1
  - SC7 additives
    - Requirements
    - Design Specifications
    - Decision List

#### **Strategy Major Item**

#### **Issues to be Considered**

a. Define the management system	Use existing models for quality assurance as a standard and similar processes for the revision of standards  Make time to market a function of user need  Flow chart the present system (input, process, output capture in model form) and define boundaries and constraints of the new management system
a. Define the management system (cont'd)	Define approval bodies for all output.

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Define window of opportunity for each project

Define standards (ISO, etc.) that Management System works to:

- Set recognition system for volunteers
- Take advantage of the latest technology

Analyze the current management system and identify the deficiencies

Review for cost effectiveness e.g. two meetings per year versus one meeting + electronic continuous development

Identify what management systems within committees are good or bad, "benchmarks":

- in other standards
- within WG's

Analyze SC 7's current activities:

- Projects – identify what went wrong if anything
- Existing approval process to see if it takes too long

Determine who are the users

b. Define relevant procedures for each identified component of the management system

Identify product groups and determine how they will be managed

Define life cycle of WG from blank slate

Define procedure for determining acceptability of a base document submitted as part of new work item proposal

Define procedures to identify user needs in the management system

Define procedures for coordination with other Sub Committees

Define procedures to incorporate expert knowledge

Define guidelines for document management and define readiness criteria for key transactions

Assure products are mutually supportive

c. Develop rigorous internal review process to establish quality of our

Implement review system of the organization itself

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products

Implement procedures to evaluate the performance of all functional posts

d. Adopt project tracking and oversight process consistent across all WGs

Adopt project tracking and oversight process consistent across all WGs (i.e. a strict set of guidelines to see if projects are on schedule and work according to plan)

Use a staged approach to development of a standard to produce a core document with planned increments specified in original project plan

Evaluate alternatives to strict milestone approach to determine progress of SC7 projects

Establish metrics for the production of standards

### **Success Criteria**

- Decreased time to market
- Improved coordination
- No late projects

### **5.3 Develop and implement practices which (increase) maximise user involvement**

The practices defined will provide:

- A process for the identification of user needs
- Regular/consistent user involvement
  - User trials
  - Feedback prior to revision of standards
  - Liaison with user groups and standards bodies
  - Regular surveys of user needs
- Promotion of standards
- Communication plan
- Reduction of the barriers to user entry i.e. using the Web, Standards development visibility

#### **Strategy Major Item**

#### **Issues to be Considered**

a. Establish user needs

Identify who are the users and a satisfactory, resourced process for collecting their needs.



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	Develop relevant standards needed by key or major industries.
	Develop relevant standards needed by small and very small software and systems development houses across all domains.
b. Establish user liaisons and on-going communication mechanisms. Survey users regularly	Develop criteria for user profiles that have validity for driving surveys.  Survey users and base the standard update on their inputs to establish which functions are most useful for them.  Establish/maintain database of individuals and user groups interested in our standards, and of current users of our standards.  Facilitate user groups and define how they are setup and supported.
c. Establish alliances with other standards making bodies	Establish implementation agreements with user groups and professional organizations.  Establish memorandum of understanding between SC7 and other societies and user groups and define/refine our respective roles and missions.
d. Enhance procedures for user involvement including removing barriers to entry	Ensure users are represented in the working groups.  Examine criteria for the participation of National Bodies in user groups.  Consider the WG10 model (as documented in the current WG10 Modus Operandi) for use by other working groups.  Identify means of conducting user trials.  Reduce the barriers to user entry i.e. Using the Web, Standards development visibility.
e. Improve publicity mechanisms	Define criteria and procedures for the implementation of the communication plan  Explore methods for maximizing announcement of proposed new standards  Improve communication about the development of ongoing standards  Develop criteria for maintaining the currency of information on SC7 Web sites and linkages (i.e. no more than 30 days)  General advertising on the web.  Identify problems and proposed solutions regarding intellectual property issues in standards development  Link our web site to other professional societies and standards producing groups.

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- f. Help users implement standards      Use innovative technologies, particularly interactive Web, to maximise user involvement in standards development.
- Capture user-product kit for user ease and to facilitate product introduction
- Develop a case study template for SC7 standard usage.
- Strongly encourage national bodies to develop road shows to explain standards and the benefits of both using and participating in their development.
- Promote broadcasting of user success stories.

### **Success Criteria**

- Implementation agreements with 6 organizations
- Published communication plan
- Projects identified for trials program usage

### **5.4    *Develop and implement management practices that better utilise scarce volunteer resources.***

Specific practices will be developed to support volunteer resources:

- Planning resource utilisation
- Accepting new work items only with adequate resources
- Implementing fast tracking procedures
- Supporting national bodies
- Minimisation of cycle time

<b>Strategy Major Item</b>	<b>Issues to Be Considered</b>
a. Implement fast track procedures	Define how to do it and the additional criteria needed.  Develop targets of opportunity for which fast track standards would be desired  Use of subcontracting e.g. in some cases, there may be parallel work going on because it is needed by a national body.
b. Manage scarce volunteer resources more effectively	Establish criteria for WG experts.  Examine possibility of developing an SC7 standard in 12 months:

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Change acceptance criteria from current 5 member bodies to 1/3 of the participating member bodies.

Help individuals to justify their participation in SC7 by providing templates for preparing their justifications and providing cost benefit analysis.

Support the national bodies in their arguments how to motivate volunteer resources for each standard and provide some means for recognition.

Write an introduction for new working group members with the procedures that apply and the decisions that have been made. Provide for their learning curve. Make sure they've had training.

Provide guidance to document reviewers such as requirements statements, decision logs, guidelines/criteria for the reviewer to improve the reviewer's performance.

Provide specific training for working group Convenors and editors

Establish a mentoring scheme to assist new working group members

c. Manage projects more effectively

Ensure that any new project have at least one base document.

Provide recognition to sponsor and participants in standards

Make sure that you have a detailed project plan for every project. See all objectives.

See also Major Strategies in 5.1 and 5.2.

Develop and implement appropriate comments templates and databases

d. Use technology more effectively to assist developers

Use of technology to facilitate volunteer workload and communication (i.e. it's easy to do it on the web, it's hard to ask for permission to go to meetings)

Develop an effective communication approach to include electronic means.

### **Success Criteria**

- Semi-annual resource plan updates
- Fast track projects identified (not to exceed 100 pages per year)
- Faster processes

## **5.5 Publish and maintain SC7 Strategic Direction document**

SC 7's strategic direction will be explicitly identified in a document which links SC 7's terms of reference, vision, objectives. In addition, it will contain the major strategies that will ensure that SC 7 achieves the agreed objectives.

### **Success Criteria**

- Published strategy direction document

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- Implemented strategies (at least 50% within the first year)

### 6. SC 7's Strategic Agenda for 1998-2002

#### 6.1 Near Term Schedule of Work for SC 7 Business Planning Group

<u>Strategy Element</u>	<u>Action/Result</u>	<u>Expected Completion Date</u>
Strategic Direction	Update (4.0)	15 Dec 1997
Product Line	Framework (Phase I)	15 Jan 1998
	Product Plan - 97	1 Feb 1998
Management System	Guideline for AG review	1 Feb 1998
- Resource Management	Guidelines for Convenor's Report	1 Feb 1998
User Involvement	SC 7 Pamphlet	15 Jan 1998

#### 6.2 Schedule of Work for SC 7 Business Planning Group after 1998 Plenary

<u>Strategy Element</u>	<u>Action/Result</u>	<u>Expected Completion Date</u>
Strategic Direction	Update (5.0)	15 Dec 1998
Product Line	Framework (Phase II)	1 Jan 1999
	Product Plan - 98	15 Jan 1999
Management System	TBD	TBD
- Resource Management	Update to Guideline for Convener's Report	15 Feb 1999
User Involvement	User survey instrument	15 Sept 1998