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Address reply to: ISO/IEC JTC1/SC7 Secretariat
École de technologie supérieure – Département de génie électrique
1100 Notre Dame Ouest, Montréal, Québec Canada H3C 1K3
secretariat@jtc1-sc7.org

www.jtc1-sc7.org

MANAGEMENT REPORT AND BUSINESS PLAN FOR

ISO / IEC JTC 1/SC7

SOFTWARE ENGINEERING

PERIOD COVERED: January 2002 -December 2002

SUBMITTED BY: François Coallier, Chairman
Alain Abran, Secretariat

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1.0 MANAGEMENT SUMMARY

1.1 JTC 1/SC7 STATEMENT OF SCOPE, VISION, PURPOSE AND CORE VALUES

Scope

The following “Terms Of Reference” were approved by JTC1 at its Plenary in Paris and endorsed by SC7 at its 1997 Plenary in Walnut Creek:

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

Note: The processes, tools and technologies are within the scope of JTC1 terms of references and exclude specific tools and technologies that have been assigned by JTC1 to other of its SC's.”

Vision

The vision of SC7, as elaborated at its 1997 Walnut Creek business planning workshop and endorsed formally by member bodies, and updated to reflect the changes in Terms of Reference since then:

A unified set of software and system 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.

Purpose

The purpose of SC7, as elaborated at its 1997 Walnut Creek business planning workshop and endorsed formally by member bodies and updated to reflect the changes in Terms of Reference since then, is to:

- Provide quality software and system 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 and system engineering standardisation through:
 - The development of a comprehensive set of integrated standards with broad international and professional consensus;
 - Initiating cooperative work with international professional and standards producing organizations;
 - A framework that:
 - Facilitate the integration and sub-contracting of standards developed in other standards producing organization;
 - Facilitate cooperative development of joint standards with other international standards producing organizations;
 - Minimises the inconsistencies between major software and system related standards including those developed by other standard producing organizations.

Area of work

We are meeting our mandate and achieving our objectives by addressing certain key areas in software and system engineering standardization:

- Software and system engineering processes: we are developing and are improving on standards which describe good software and system engineering practices, as well as standards to consistently assess organisational software and system engineering practices against a given benchmark;
- Software system products: we are developing and are improving on standards which allow purchasers and buyers to size and document software products as well as to express, measure and evaluate the quality of the software that is produced and its contribution to the final product or application system;
- Enterprise architecture: in partnership with the Object Management Group ([OMG](#)), we are developing and are improving on Open Distributed Processing (ODP) standards to integrate IT and business system definition and provide the software and system engineering tools to implement enterprise information systems.
- Software engineering environment: we are developing and are improving on standards which make it easier to use software engineering environments and to re-use and re-deploy the data contained in them.
- Software engineering body of knowledge: we are working with the Institute of Electrical and Electronics Engineers Computer Society ([IEEE-CS](#)) on their guide to the Software Engineering Body of Knowledge (SWEBOK), with the objective to publish it as a ISO/IEC Technical Report.
- Management of software assets: we are working on the development of a standard that will describe the basic requirements of a software asset management environment.

Core Values

SC7 core values are:

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

1.2 PROJECT REPORT

As of 2000-09-12, there were 38 active projects / sub-projects in JTC 1/SC7 (see <http://www.jtc1-sc7.org/>).

These are handled by 12 active working groups (See annex A)

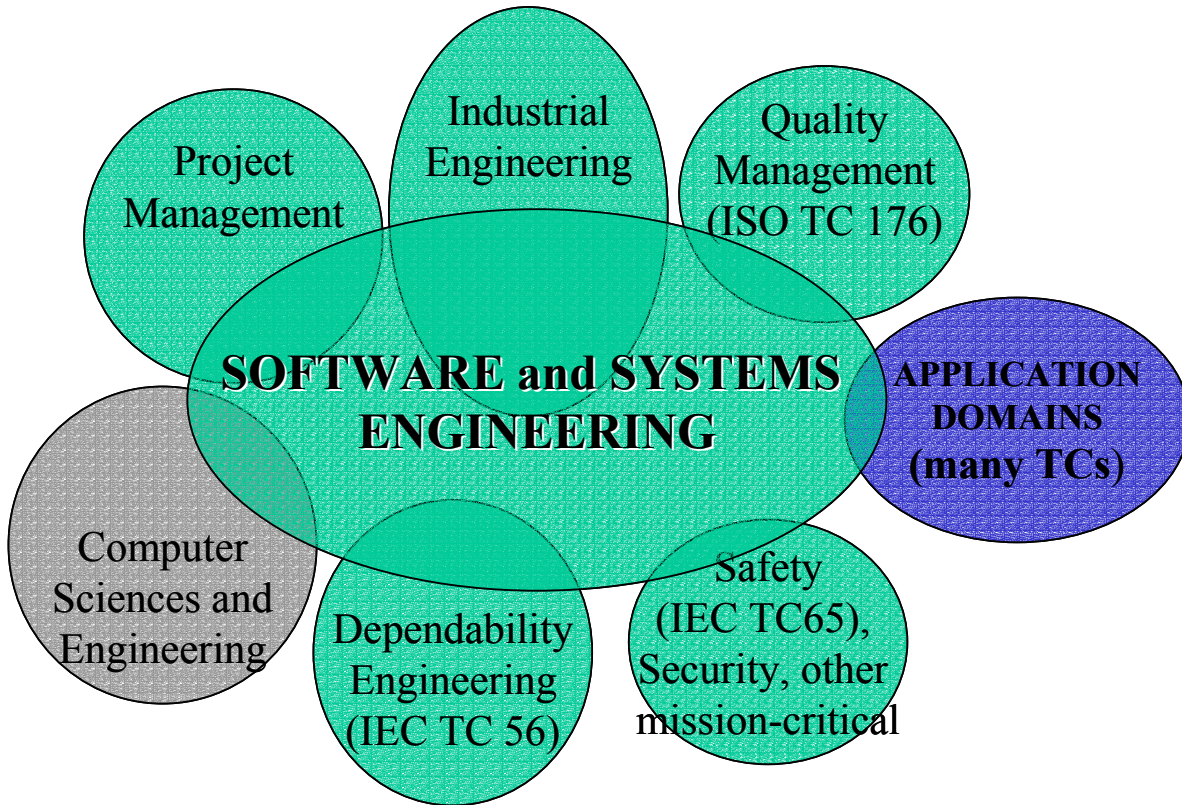
The following standards have been published between the last JTC 1 Plenary and 2002-09-12:

- ISO/IEC 9126-1:2001 Software engineering -- Product quality -- Part 1: Quality model
- ISO/IEC 10746-4:1998/Amd 1:2001 Computational formalization
- ISO/IEC 14598-6:2001 Software engineering -- Product evaluation -- Part 6: Documentation of evaluation modules
- ISO/IEC 14769:2001 Information technology -- Open Distributed Processing -- Type Repository Function
- ISO/IEC 15437:2001 Information technology -- Enhancements to LOTOS (E-LOTOS)
- ISO/IEC 12207/FPDAM-1: 2002 Software Engineering - Life Cycle Processes
- ISO/IEC 15939: 2002 Software Engineering - Software Measurement Process

1.3 COOPERATION AND COMPETITION

Internal

JTC 1 has recognized that its SC7 is a “process focused” SC. The diagram that follows illustrate how SC7 scope interact with other SC’s and disciplines:



All those overlaps have the potential to generate liaison challenges.

There are at least two other process focused TC’s in ISO and IEC that also had overlap with the JTC1/SC7 program of work: ISO/TC176 and IEC/TC56.

The program of work overlap issues with ISO/TC 176 have been resolved through liaison and the transfer of the responsibility for the maintenance of ISO 9000-3 to JTC 1/SC7.

By regard to IEC/TC 56, the following was in resolution 675 from the Busan Plenary:

JTC1/SC7 instructs its Secretariat to

- a) Contact TC56 to formalize the transfer of IEC/TC56 Project 61720 to JTC1/SC7/WG9. Transfer of IEC/TC56 Project 61720: Guide to techniques and tools for achieving confidence in software. This will be circulated as a NWI ballot to JTC1/SC7.

.....

JTC 1/SC7 mandate further its WG9 to negotiate with IEC TC56 a coordinated program of work, and submit it to SC 7 for approval through letter ballot before the next Plenary.

.....

The transfer of IEC/TC56 Project 61720 to JTC1/SC7/WG9 was completed in August 2002.

External

SC7 has A liaisons with:

- QuEST Forum
- ITU-T
- INCOSE
- OMG
- IEEE Computer Society

Documents from the IEEE Computer Society, the OMG and the ITU-T are currently moving through the standardization process either as PAS, Fast Track or through the normal process.

By regard to the IEEE Computer Society liaison, SC7 has approved the following resolution at its last Plenary in Busan (672):

JTC 1/SC7 expresses to IEEE CS its appreciation for its comprehensive liaison proposal (SC7 N2617).

JTC 1/SC7 agrees in principle with the IEEE CS proposal as outlined in SC7 N2617.

JTC 1/SC7 mandates its Secretariat to request that its Member Bodies sent their comments on the aforementioned IEEE CS proposal by 2002-09-15. JTC 1/SC7 mandates its BPG to resolve these comments and come with an initial plan that could be sent to JTC 1/SC7 members for approval at the next SC7 Plenary meeting.

In parallel, JTC 1/SC7 request that its WG assess potential areas of cooperation with IEEE CS. Any such areas should be communicated to the BPG for consideration.

It is expected that, while the details of a joint program with IEEE CS will be worked out, some joint-projects may be initiated..

2.0 PERIOD REVIEW

2.1 MARKET REQUIREMENTS

Overall Trend

As a direct result of the use of computerized devices, the world is now very dependent on software systems. Products based on the information and communication technologies (ICT) are now ubiquitous in industrialized societies, whether for commercial, industrial or domestic applications. ICT-based products are software systems, and it is the software that makes these products work.

The range of ICT applications is wide and continually expanding, from cardiac pace-makers and traffic control systems to business and entertainment systems. The interests of consumer using these applications must be protected, and risks of all kinds which may arise from the failure of such software systems must be minimized. Never has it been more important for software and system engineers to deliver reliable and safe systems to business, to industry and to society at large.

The ability to design and implement ICT systems and products has greatly improved in the last ten years. A recognized core body of knowledge in software engineering now exists, a sign that software engineering it is now maturing into a recognized profession. Challenges still abound because of the pressure to build more complex applications and products in an ever-shorter time-frame (a *Web Year* is 3 months).

Looking forward, the challenge of developing increasingly complex information systems increasingly quickly will remain. In addition, many of these software-intensive systems will also perform more and more critical tasks in our society. All this will not only drive the formalization of the software and system engineering discipline, but also the market for re-usable components.

SC7 Marketplace

The over-riding requirement is that the software and system engineering standards are focused on the needs of the users of those standards. We are targeting in our work the following types of *standards user*:

Software and Systems Houses

Those who supply the software and system needs of the consumer, commercial, industrial, defence, and public sectors, and who need to preserve their competitiveness in the face of ever changing world markets. To address international markets, they need to be able to offer services and products that will match the best available from anywhere in the world.

Software and system engineering standards from JTC 1/SC7 provide one of the means to judge what is meant by *best*.

Corporate Information Systems Users

Software and system engineering standards can directly serve the needs of using organizations by reducing costs, encouraging fair competition, allowing re-use of existing software and generally reduce risks and uncertainty.

ODP and associated standards provide enterprise architects and system developer's tools to architect and design robust, modular enterprise applications and systems.

Embedded software system suppliers

This category includes a wide variety of companies supplying software which is embedded within systems that are themselves embedded in a product. It might be a consumer product such as a cell phone or a car, a weapons control system, or a heart pace maker. In all these cases the software is just a component of the system or final product, but it is critical that it is well engineered in the context of the overall engineering effort involved.

Methods and tools suppliers

Although this market is still formative there are already ad-hoc and proprietary standards for software and system engineering methods and tools. As the market matures it is important to remove barriers to more open use of CASE tools and methods.

Software and System engineering educators

As mentioned earlier, JTC 1/SC7 standards define a *body of knowledge* of good practices. These standards, including the one specifically addressing this issue currently under development, provide a sound foundation for educators in software and system engineering.

Domain specific standards developers

JTC 1/SC7 standards are, in ISO jargon, horizontal standards. This means that these standards are basically of a generic nature and can be applied in different domains such as for the development of transportation systems, space systems, security products, etc.. Organisation developing those *domain* specific standards will find in JTC 1/SC7 standards a foundation they can use to build on.

Market Inputs

In the last few years, many new work items that were initiated in SC7 came with the backing and support of professional and commercial organizations or communities, many of whom became formal C or A liaison afterward. The program of work of our WG 4 (IEEE Computer Society), 7 (INCOSE), 10 (ESI,), 19 (OMG), 12 (IFPUG, NESMA, UKSMA), and 20 (IEEE Computer Society) essentially reflect this.

Other strategy previously used for customer inputs are:

- TR 15504-1/9 Software Product Assessment
 - Extensive trials of draft standards
- Workshops on special topics in ISO/IEC P15288 System Life Cycle Processes:
 - Safety (Canada)
 - Security (Germany)
 - Human Factors (UK)

Market requirements for software and system engineering standards are also informally assessed through the active participation of SC7 members to professional events such as the International Symposium and Forum on Software Engineering Standards (ISESS). One ISESS was held just before the SC7 Plenary in the same location and another has been held just before the SC7 Curitiba plenary in May of 1999.

One element of standard market relevance could be the measurement of internet URL's citing of SC7 standards. The table next page summarizes the finding of an t Internet survey done at the end of 2001 by a SC7 BPG member (Dr. Hans Daniel):We can see from this data that:

- ISO 9000-3has the largest number of citations.
- 15288 not a standard yet, is already drawing citations.
- The SC7 core products with the largest number of citations work are: 12207, 15504, and 9126.
- There is growing interest is devoted to 15504, 14143, 9126, 14598

Doc-Nr.	Title / Date->	Google	Altavista
		2001-10-10	2001-10-10
ISO 5806	Specification of single-hit decision tables	23	11
ISO 5807	Documentation symbols and conventions	116	43
ISO 6592	Guidelines for the documentation of computer-based application systems	72	24
ISO 8790	Computer system configuration diagram symbols and conventions	28	12
ISO 9000-3	Guidelines for the application of ISO 9001 to the design, development, supply, installation and maintenance of computer software	5690	3019
ISO/IEC 9126	Quality characteristics and guidelines for their use	1330	499
ISO 9127	User documentation and cover information for consumer software packages	102	39
ISO/IEC 12119	Software packages -- Quality requirements and testing	498	271
ISO/IEC 12207	Software life cycle processes	2870	1024
ISO/IEC 14102	Guideline for the evaluation and selection of CASE tools	115	59
ISO/IEC 14143	Functional size measurement	245	75
ISO/IEC 14568	DXL: Diagram eXchange Language for tree-structured charts	19	4
ISO/IEC 14598	Software product evaluation	439	114
ISO/IEC 14756	Measurement and rating of performance of computer-based software systems	40	6
ISO/IEC 15271	Guide for ISO/IEC 12207 (Software Life Cycle Processes)	21	8
ISO/IEC 15288	System Life Cycle Processes	242	76
ISO/IEC 15504	Software Process Assessment	1210	615
<i>SWEBOK</i>	Software Engineering Body of Knowledge	849	196

2.2 ACHIEVEMENTS

See sections 1.2 and 3.2

2.3 RESOURCES

SC7 recognize that resources are an important factor for the successful the execution of the work program. At this point in time, there is sufficient support for all of the SC7 projects.

A strategy to address this is to bring in projects with documents that have been already developed by other standardizations organization. This is what was done with the OMG and the IEEE Computer Society.

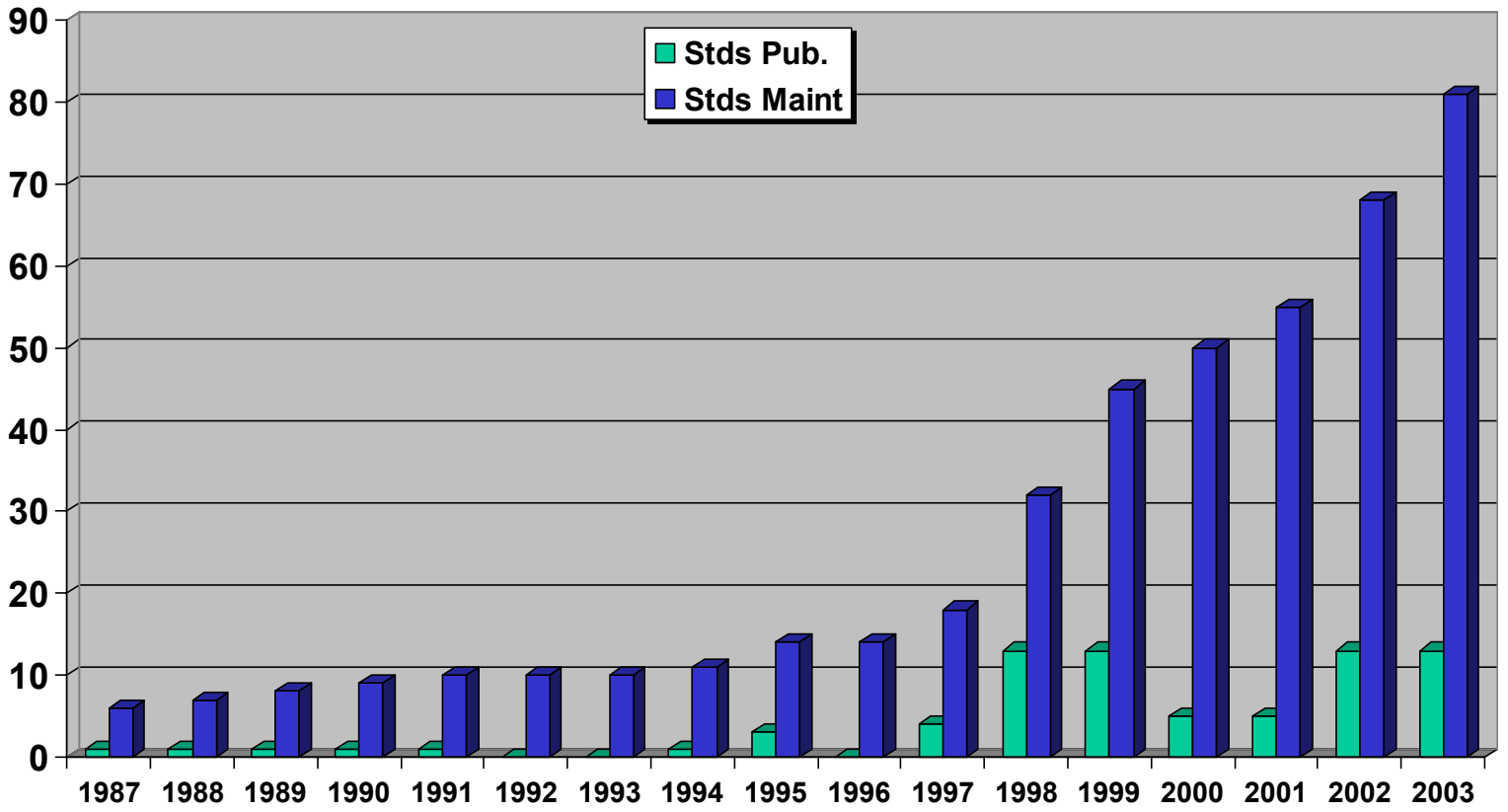
3.0 FOCUS NEXT WORK PERIOD

DELIVERABLES:

The following projects are near completion:

- 9126-4: Software Engineering - Product quality - Part 4: Quality In Use Metrics
- 15474: Software Engineering - CDIF Framework - Parts 1 and 2
- 15475 Software Engineering - CDIF Transfer Format - Parts 1, 2 and 3
- 15476: Software Engineering - CDIF Semantic Metamodel - Parts 1,2
- 9126-2: Software Engineering Software Product Quality - Part 2: External Quality
- 14143-2: Definition of Functional Size Measurement - Part 2: Conformance Assessment of Software Sizing Model
- 14143-3: Definition of Functional Size Measurement - Part 3: Verification of a Functional Size Model
- 14143-4: Definition of Functional Size Measurement - Part 4: Functional Size Measurement Reference Model
- 14143-5: Definition of Functional Size Measurement - Part 5: Determination of Functional Domains for use with Functional Size
- 15414: Open Distribution Processing - Enterprise Language
- 15504-2/FPDAM-1: Amendment To ISO/IEC TR15504-2 - Information Technology - Software Process Assessment - Reference Model Extensions For Acquirer Processes.
- 15939: Software Measurement Process
- 15288 – System Life Cycle Process
- 19501-1 – UML PAS
- 19500-2 – ODP – GIOP/IIOP PAS
- 15414 – ODP Enterprise Language (ITU X911)
- 19762 - IFPUG PAS
- 20926 – MKII PAS
- 19761 – COSMIC FFP
- 19759 – SWEBOK
- 9000-3 – Guidelines for the app. Of 9001:2000 to SW

Standard production by SC7 is presently looking as follows:



STRATEGIES

An SC7 Strategic Planning Workshop was held prior to the 1997 Walnut Creek Plenary and the results documented in SC7 07N1763, SC7 Direction Statement 1997. This document was accepted by SC7 member bodies after formal balloting.

Business Planning activities have been going on in SC7 for the last 6 years. To ensure proper focus and continuity, SC7 has formalized at its 1997 Walnut Creek Plenary the SC7 Business Planning Group (BPG) as a “special working group” (SWG) with the mandate to:

- plan, support and organize Management Workshop,
- proposed update to the SC7 business plans and procedures,
- propose updates to SC7 communications function,
- plan transition of SC7 to become a horizontal committee,
- update the SC7 Product Plan,
- prepare the SC7 Product Line Definition Proposal,
- provide oversight of the SC7 vocabulary activities,
- prepare procedures and organization responsibilities to ensure an integrated strategy planning, business planning, and management system for SC7.

The BPG is under the direction of the JTC1/SC7 Chair and his currently composed of:

- Mr Alain Faisandier (France)
- Mr Doug Thiele (Australia)
- Mr. Hans Daniel (Germany)
- Mr Michael Gayle (USA)
- Mr Jean Bérubé (Canada)
- Dr. Y. Yamamoto (Japan)

Since the 1997, Walnut Creek Plenary, SC7 will has a one day management workshops prior to all Plenaries. This was carried out at the last Plenary in Johannesburg.

Full day business planning activities are now held by the SC7 Advisory Group in each plenary meeting.

All SC7 Business Planning documents can be found at the SC7 web site <http://www.jtc1-sc7.org/> under the heading *Planning*.

Key SC7 strategies can be summarized as follows:

- Continuous and proactive planning (Business Planning, Standards Architecture Planning, Study Groups,...)
- Work with National Organizations as well as International Professional organizations and Consortium/Foras
- Leverage as much as possible standardization work performed by Professional organizations and Consortium/Foras
- Use optimally all the tools in the JTC 1 Procedures for standardization (Normal process, accelerated process, Fast Track, PAS)
- Maintain consensus and harmony

RISKS

SC7 is presently in a mode where its focus is to produce new standards. As documented in section 3.0, a significant number of deliverables will be produced in the next 15 months.

Risks are managed through:

- Proactive business planning
- Continuous management

SC7 has currently two Special Working Groups (SWG) in place to contribute to the above:

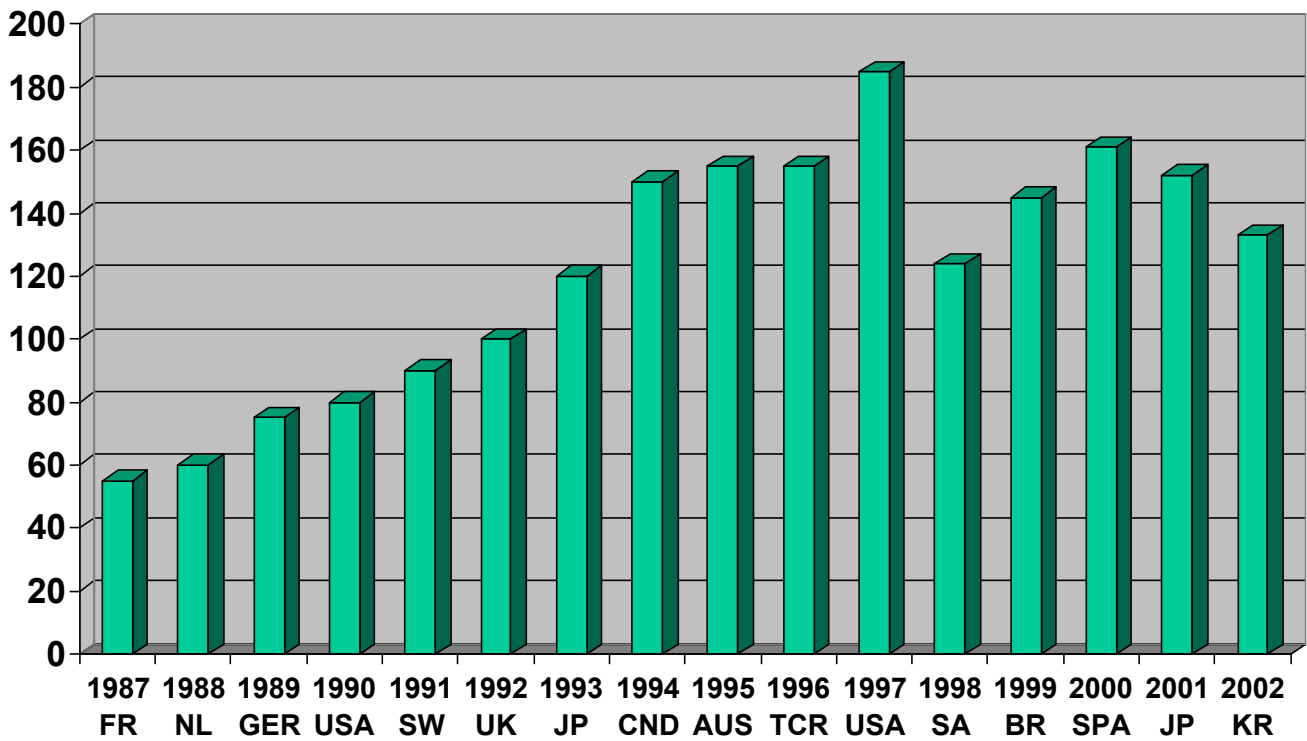
- SWG1 on business planning
- SWG5 on architecture management

See Annex A for further details.

OPPORTUNITIES

Plenary Attendance

SC7 has seen in the last few years its attendance at Plenary meetings has grown continuously to reach a plateau of between 120 and 140 (see figure). Host for future plenary meetings have been identify for the next 3 years. The growing importance of software based product and services in our post-industrial society should ensure that interest in SC7 should remains high in the foreseeable future as long as proper market relevance is maintained.



New projects

The following projects have been initiated in the period:

- ISO/IEC WD 19770 Information technology -- Software Asset Management Process
- ISO/IEC DIS 24570 Software engineering -- Definitions and counting guidelines for the application of Function Point Analysis (PAS)
- ISO/IEC DIS 16085 Information technology -- Software life cycle processes -- Risk Management (Fast Track)
- ISO/IEC NP 16213 Guide to techniques and tools for achieving confidence in software (Transfer from IEC/TC56)

The following NWI are presently been considered:

- New Proposal for the Revision of ISO/IEC 15026 - System and Software Integrity Levels
- New Proposal for a Standard on Petri Net Techniques
- New Proposal to re-activate and complete project 15476-04 CDIF Semantic Metamodel – Part 04: Data Models
- New Proposal to re-activate and complete project 15476-06 CDIF Semantic Metamodel – Part 06: State/Event Model

The following NWI are planned:

- Software measurement - Functional size measurement - Guide for use of 14143 series(functional size measurement) and related international Standards (Resolution 662)
- Guideline on the use of Unified Modeling Language (UML) (Resolution 663)
- Information Technology – Requirements Engineering Tool requirements (Resolution 664)
- Harmonization and Revision of ISO/IEC 15288 and ISO/IEC 12207 (Resolution 665)
- SC7 Consolidated Terminology and Vocabulary (Resolution 674)
- Revision of ISO/IEC 14143-1:1998 - Information technology - Software measurement - Functional size measurement - Definition of concepts (Resolution 678)
- Maintenance project for ITU-T Rec. X.901-3|ISO/IEC 10746 Parts 1-3, Reference Model for Open Distributed Processing (Resolution 679)

WORK PROGRAM PRIORITIES

SC7 work program strategy is to suspend or cancel any project that does not have sufficient resource. Consequently, SC7 priorities are to ensure that its present work program is executed in a timely fashion while producing quality documents.

ANNEX A: SC7 ORGANIZATION

The following WG are presently active:

WG	SCOPE	CONVENER
2	Development of standards for the <u>documentation of software systems</u> .	Ken Johnson - UK (2000 - N2335)
4	Development of standards and technical reports for <u>tools and Computer Aided Software/System Engineering (CASE) environments</u>	D. Lee - Korea (1999 - N2178)
6	Development of standards and technical reports for <u>software products evaluation and metrics</u> for software products & processes.	Motoei Azuma - Japan (2000 - N2335)
7	Development of standards and technical reports on <u>Life Cycle Management</u> .	Doug Thiele - Australia (2002 - N2xxx)
9	Preparation of standards, technical reports, and guidance documents related to <u>system integrity</u> at the system and system interface level. In this context, system integrity is defined as ensuring the containment of risk or confining the risk exposure.	Hans Daniel - Germany (2002 - N6xxx)
10	Development of standards and guidelines covering methods, practices and application of <u>process assessment</u> in software product procurement, development, delivery, operation, evolution and related service support.	Alec Dorling - UK (2000 - N2335)
12	To establish a set of practical standards for <u>functional size measurement</u> . Functional size measurement is a general term for methods of sizing software from an external viewpoint and encompasses methods such as Function Point Analysis.	Pam Morris - Australia (2000 - N2335)
17	<u>ODP Enterprise viewpoint</u> .	R. Alexander (Sandy) Tyndale-Biscoe - UK
18	Software and system engineering <u>Quality Management</u> standards development.	Victoria Hailey - Canada (2000 - N2335)
19	Includes <u>modelling languages, metadata, ODP framework and ODP components</u> related standards and project, as well as provide the focal point to facilitate collaborative work with OMG and ITU-T, and other organizations if required (IEEE).	Bryan Wood - UK
20	Standardization of the <u>Software Engineering Body of Knowledge</u>	Juan Garbajosa - Spain
21	<u>Software Asset Management Process</u> standards development.	L. Piper - Sweeden

Two Special Working Groups (SWG) have been created to handle Business Planning and Architecture:

SWG1	<i>Business Planning Group (Resolution 683)</i>
Convener	<i>François Coallier - SC7 Chairman</i>
Scope:	<ol style="list-style-type: none"> 1. Support the Chair in the elaborations of directions and policies. 2. Assist the chair in the prompt resolution of issues. Propose update to the JTC1/SC7 business plans and procedures. 3. Propose updates to JTC1/SC7 communications function. 4. Prepare procedures and organization responsibilities to ensure an integrated strategy planning, business planning, and management systems for JTC1/SC7.
Members:	<ul style="list-style-type: none"> • Mr Alain Faisandier (France) • Mr Doug Thiele (Australia) • Mr. Hans Daniel (Germany) • Mr Michael Gayle (USA) • Mr Jean Bérubé (Canada) • Dr. Y. Yamamoto (Japan)

SWG5	<i>Architecture Management (Resolution 684)</i>
Chairman Convener	<i>François Coallier - SC7 Chairman</i> <i>Cheryl Jones - USA</i>
Scope:	<ol style="list-style-type: none"> 1. Elaborate and Maintain JTC1/SC7 Architecture standing documents 2. Provide counsel to JTC1/SC7 Conveners and editors on standards architecture and vocabulary consistency issues 3. Recommend to JTC1/SC7 standard maintenance strategies 4. Report on its activities to the JTC1/SC7 BPG and AG
Members:	<ul style="list-style-type: none"> • Jean-Philippe Lerat (France) • Andy Coster (UK) • Shigenobu Katoh (Japan) • TBD (Canada) • Jack McGarry (USA) • Bud Lawson (Sweden) • Terry Rout (Australia)

