IEEE Computer Society
Category A Liaison to JTC 1/SC 7: Status Report

Jim Moore
IEEE CS Liaison Representative
Prepared for IEEE-CS SAB
June 2009
IEEE CS Liaison Team

• Jim Moore
• Pieter Botman
• Terry Doran
• Also, editors on several joint projects
Why Do We Do This?

- Throughout the Computer Society, we are undertaking efforts to make the Society to “go to” place for software engineering.
- One of our strengths is the standards collection of the Software and Systems Engineering Standards Committee (S2ESC).
- One of our weaknesses is the extent of inconsistency between these standards and international standards (from ISO/IEC JTC 1/SC 7) on the same subject. This handicaps the global appeal of our standards.
- We have undertaken a program to make the two collections completely consistent.
- We use several methods:
  - Sometimes SC 7 adopts an IEEE standard.
  - Sometimes IEEE adopts an SC 7 standard.
  - Sometimes we merge our respective standards.
  - Sometimes we perform “coordinated development” of a new standard or a revision.
- We are both a member of the US TAG to SC 7 and a Category A liaison to SC 7.
PSDO Agreement

• The IEEE Standards Association and ISO Central Secretariat have concluded a PSDO – Partner Standards Development Organization – agreement.

• The agreement provides uniform procedures for joint development and maintenance of standards by IEEE and designated TCs of ISO and SCs of JTC 1.
Successes (1 of 3)

• Since 1996, IEEE has adopted several SC7 standards
  – 1462 (was ISO/IEC 14102), CASE Tool Evaluation and Selection
    • IEEE adoption of revised 14102 and TR 14471 is underway
  – 1465 (was ISO/IEC 12119), SW Package Quality
    • But has been withdrawn, so there is no conflict with 25051
  – 12207.0 (was ISO/IEC 12207), SW LC Processes
    • Replaced by coordinated revision.
  – 14143.1 (was ISO/IEC 14143-1), Functional Size Measurement
  – 15288, System Life Cycle Processes
    • Replaced by coordinated revision.
  – 15939, Measurement Process
  – 90003, Guide to 9001 for Software
Successes (2 of 3)

• SC7 has adopted IEEE standards
  – 16085 (was IEEE 1540), Risk Management Process
  – 19759, SWEBOK Guide
  – 23026 (was IEEE 2001), Web Site Practices
    • Russian language edition was published
  – 26702 (was IEEE 1220), Systems Engineering Process
    • A coordinated revision will be initiated.
  – 42010 (was IEEE 1471), Architecture Description
    • Coordinated revision is underway.
Successes (3 of 3)

• We have jointly revised three shared standards
  – 12207, Software Life Cycle Processes
  – 15288, System Life Cycle Processes
  – 16085, Risk Management Process

• Some standards have been merged
  – ISO/IEC 14764 and IEEE 1219, SW Maintenance
Projects underway in IEEE

• Adopt ISO/IEC 15289 to replace IEEE 12207.1.

• Adopt ISO/IEC 26514 to replace IEEE 1063.

WG 22: Vocabulary

- Shared vocabulary for software and systems engineering.
- IEEE contributed IEEE Std 610.12. SC 7 contributed its vocabulary aggregations. Other sources, e.g. PMI, made contributions.
- IEEE CS has developed and is hosting a database application providing public web access.
  - [http://www.computer.org/sevocab](http://www.computer.org/sevocab)
- SC 7/WG 22 will maintain the database and will facilitate the consolidation of alternative definitions.
- Occasional snapshots of the database will be published as ISO/IEC and IEEE 24765.
- FDIS 24765 is currently in ballot and will soon enter balloting in IEEE.
WG 26: Testing

- BSI has contributed their two standards on testing.
- IEEE has contributed 829 and 1008.
- A new four-part standard will be created at the international level.
  - Compatible with international (and IEEE) systems and software processes
  - Compatible with international (and IEEE) documentation standards
  - Compatible with IEEE CS SWEBOK Guide
  - Covering a larger scope than the current standards
- IEEE-CS has provided Ursula Parker as the editor
- The NP ballot was approved in May 2007.
WG7: Revision of 15026, Systems Assurance

- IEEE has provided editor: Sam Redwine.
- Project has been subdivided to produce a standard of four parts.
  - 15026-1 was approved by JTC 1, changed to fix small problems, and sent for publication.
  - 15026-2 was approved in 2nd CD ballot, but will undergo another CD ballot.
  - 15026-3: draft prepared; CD draft will be prepared.
  - 15026-4: statement of requirements prepared; WD will be prepared.
WG7: 29148, Requirements Engineering

- Will replace IEEE 830 and 1233
- New Work Item Proposal was approved.
- IEEE (Mark Henley) contributed a mash-up draft drawing on the relevant base documents.
- WD 3 was recently distributed for comment; a CD will be prepared.
WG7: Revision of 16326, Project Management

- Will replace TR 16326 and IEEE 1058.
- IEEE provided editor: Mark Henley.
- Approved in FCD balloting
- Approved in IEEE recirculation
- Many delays in initiating FDIS ballot
- FDIS ballot is due to complete June 29.
WG 7: Life Cycle Management

- WG 7 is preparing a three-part TR, 24748, to provide guidance for 12207 and 15288.
- IEEE contributed material for the documents.
- IEEE plans to adopt the results.
WG 20: Certification

• SC 7/WG 20 completed ISO/IEC 24773, Certification of software engineering personnel.
  – IEEE is the first to conform with its CSDA and CSDP certifications.
WG 20: Software Engineering Body of Knowledge

  – Extensive consensus process
  – 5 rounds of review, 10,000 comments from more than 500 reviewers in 42 nations.
  – SC 7 experts participated in the IEEE consensus process

• SWEBOK Guide was adopted unchanged as TR 19759.
Revision of SWEBOK Guide

• IEEE CS will commence revision of SWEBOK Guide in 2009, completing in 2010.

• Lead editors:
  – Pierre Bourque, Canada
  – Alain Abran, Canada
  – Juan Garbajosa, Spain
  – Gargi Keeni, India
  – Beijun Shen, China
Planned Content of 2010 SWEBOK Guide

- Characterizing the Practice of Software Engineering
  - SW Requirements
  - SW Design
    - Human-Computer Interface Design
  - SW Construction
  - SW Testing
    - Human-Computer Interface Testing
  - SW Maintenance
  - SW CM
  - SW Eng Management
  - SW Eng Process
  - SW Eng Methods [changed name]
    - Cross-KA methodologies and their selection
    - [Distribute tools into other KAs]
  - SW Quality
    - SW Eng Professional Practice

- Required in Educating a Software Engineer
  - Computer Science Foundations
  - Mathematical Foundations
  - Engineering Foundations
  - Economic Foundations

- Related Disciplines
  - Computer Engineering
  - Computer Science
  - Mathematics
  - Management
  - Project Management
  - Quality Management
  - Software Ergonomics
  - System Engineering

- Supplementary ("trial-use")
  - Measurement
  - Security

General: Increased emphasis on computing security.
Planned Relationship to SC 7

• SC 7 experts would participate in review and commenting, currently scheduled for October 2009.

• Resulting document would be fast-tracked, under subclause 16.5 of Directives, late 2010 or early 2011.
Anticipated Work

• Agile Methods
  – IEEE was requested to contribute draft standard P1648 as well as the final version.

• Configuration Management
  – Alastair Walker was named as rapporteur to IEEE for its project to revise IEEE Std 828.
  – IEEE is prepared to revise 828 and submit it for fast-track following revision.
New Study Groups

• Certification schemes in SWE
  – Pieter Botman is co-chair
• Service-Oriented architectures
• Software Process Quality framework
• System Integration
• Service Oriented Architecture (SOA)
• IT Enabled Services (ITES)
• Coding for embedded systems
• Tools and methods of software testing
• IS Governance for Cloud Computing
• IS Governance for Service Providers
• IS Governance for IS Audit
• IS Governance for Enterprise Architecture
# The State of Harmonization in 1995

<table>
<thead>
<tr>
<th>Topic</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminology &amp; Concepts</td>
<td>Red</td>
<td>Different vocabulary standards</td>
</tr>
<tr>
<td>Testing</td>
<td>Orange</td>
<td>IEEE standards unrelated to SC7 processes.</td>
</tr>
<tr>
<td>Architecture description</td>
<td>Harmless</td>
<td>SC7 didn’t have architecture standards.</td>
</tr>
<tr>
<td>Product quality</td>
<td>Yellow</td>
<td>Unrelated standards</td>
</tr>
<tr>
<td>Life cycle processes</td>
<td>Red</td>
<td>Incompatible standards</td>
</tr>
<tr>
<td>Systems engineering process</td>
<td>Yellow</td>
<td>Unrelated standards</td>
</tr>
<tr>
<td>SW maintenance</td>
<td>Red</td>
<td>Incompatible standards</td>
</tr>
<tr>
<td>Measurement</td>
<td>Yellow</td>
<td>Unrelated standards</td>
</tr>
<tr>
<td>Risk management</td>
<td>Harmless</td>
<td>No standards at all</td>
</tr>
<tr>
<td>Project management</td>
<td>Red</td>
<td>Incompatible standards</td>
</tr>
<tr>
<td>Verification and validation</td>
<td>Red</td>
<td>Fundamentally different approaches; minor incompatibilities in details</td>
</tr>
<tr>
<td>Configuration management</td>
<td>Red</td>
<td>Incompatible standards</td>
</tr>
<tr>
<td>SW process assessment</td>
<td>Yellow</td>
<td>Nothing in IEEE. ISO process assessment incompatible with ISO LC.</td>
</tr>
<tr>
<td>Requirements engineering</td>
<td>Orange</td>
<td>IEEE standards unrelated to SC7 processes</td>
</tr>
<tr>
<td>SW life cycle data</td>
<td>Red</td>
<td>Incompatible standards</td>
</tr>
<tr>
<td>User documentation</td>
<td>Red</td>
<td>Incompatible standards</td>
</tr>
<tr>
<td>CASE tools</td>
<td>Yellow</td>
<td>Minor incompatibilities</td>
</tr>
<tr>
<td>Notations</td>
<td>Harmless</td>
<td>Distinct standards for distinct notations</td>
</tr>
<tr>
<td>Internet</td>
<td>Harmless</td>
<td>No standards</td>
</tr>
<tr>
<td>IT Services, Management, Governance</td>
<td>Harmless</td>
<td>No standards</td>
</tr>
<tr>
<td>Specialty Engineering (Safety, Security)</td>
<td>Orange</td>
<td>Unrelated approaches</td>
</tr>
<tr>
<td>Others</td>
<td>Yellow</td>
<td>Many unrelated standards</td>
</tr>
</tbody>
</table>
## The State of Harmonization … Today

<table>
<thead>
<tr>
<th>Topic</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminology &amp; Concepts</td>
<td>Yellow</td>
<td>Shared BOK, joint vocabulary project, potential certification framework</td>
</tr>
<tr>
<td>Quality management</td>
<td>Yellow</td>
<td>IEEE adopted ISO/IEC 90003.</td>
</tr>
<tr>
<td>Testing</td>
<td>Orange</td>
<td>Both IEEE and BSI will harmonize with SC7 processes</td>
</tr>
<tr>
<td>Architecture description</td>
<td>Green</td>
<td>SC7 adopted IEEE standard and will harmonize with processes.</td>
</tr>
<tr>
<td>Product quality</td>
<td>Yellow</td>
<td>ISO/IEC 12119 was revised as 25051. IEEE will withdraw its standard.</td>
</tr>
<tr>
<td>Life cycle processes</td>
<td>Green</td>
<td></td>
</tr>
<tr>
<td>Systems engineering</td>
<td>Green</td>
<td>Shared SE process standard; harmonization with other LC processes underway</td>
</tr>
<tr>
<td>SW maintenance</td>
<td>Green</td>
<td>Project to merge IEEE and ISO standards is completed</td>
</tr>
<tr>
<td>Measurement</td>
<td>Yellow</td>
<td>IEEE adopted 15939. Some details remain.</td>
</tr>
<tr>
<td>Risk management</td>
<td>Green</td>
<td>SC7 adopted IEEE standard and it was jointly revised to deal with systems.</td>
</tr>
<tr>
<td>Project management</td>
<td>Yellow</td>
<td>Project is merging the incompatible standards.</td>
</tr>
<tr>
<td>Verification and validation</td>
<td>Red</td>
<td>Fundamentally different approaches. Good intentions, but no action yet.</td>
</tr>
<tr>
<td>Configuration management</td>
<td>Yellow</td>
<td>SC7 withdrew its standard; systems issues remain. IEEE is about to revise.</td>
</tr>
<tr>
<td>SW process assessment</td>
<td>Yellow</td>
<td>Harmonization with LC process standards is underway</td>
</tr>
<tr>
<td>Requirements engineering</td>
<td>Orange</td>
<td>Joint project has been approved; mashup of relevant standards is being prepared.</td>
</tr>
<tr>
<td>SW life cycle data</td>
<td>Yellow</td>
<td>IEEE is adopting 15289 to replace 12207.1</td>
</tr>
<tr>
<td>User documentation</td>
<td>Yellow</td>
<td>IEEE 1063 has been incorporated into 26514. IEEE will adopt it.</td>
</tr>
<tr>
<td>CASE tools</td>
<td>Yellow</td>
<td>Minor incompatibilities</td>
</tr>
<tr>
<td>Notations</td>
<td>Harmless</td>
<td>Distinct standards for distinct notations</td>
</tr>
<tr>
<td>Internet</td>
<td>Green</td>
<td>Shared standard</td>
</tr>
<tr>
<td>IT Services, Management, Governance</td>
<td>Yellow</td>
<td>IEEE will adopt 20000 standards</td>
</tr>
<tr>
<td>Specialty Engineering (Safety, Security)</td>
<td>Orange</td>
<td>Unrelated approaches will be addressed in part by coordination revision of 15026</td>
</tr>
<tr>
<td>Others</td>
<td>Yellow</td>
<td>Many unrelated standards</td>
</tr>
</tbody>
</table>