Applying Software Engineering Standards in Small settings
Recent historical perspective and Initial Achievements

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Editor – SC 7/Working Group 24
Content

• Introduction
• Mandate of ISO/IEC JTC1/SC7
• History of the establishment of a new SC 7 Working Group
• Achievements to date
• First Meeting of Working Group 24
**Very Small Enterprises (VSE)**

- VSEs are defined as having less than 25 employees.
- Scope includes also small project or department within a larger organization.
- Example – Software VSEs of Greater Montréal Area:

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>Number of Enterprises</th>
<th>Percentage</th>
<th>Number of Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 25</td>
<td>540</td>
<td>78%</td>
<td>5105</td>
</tr>
<tr>
<td>25 to 100</td>
<td>127</td>
<td>18%</td>
<td>6221</td>
</tr>
<tr>
<td>Over 100</td>
<td>26</td>
<td>4%</td>
<td>6056</td>
</tr>
</tbody>
</table>
VSEs and Standards

• International standards were not written for and/or is hard to apply in small projects, small development organizations, or companies that have between 1 and 25 employees.
• International Life Cycle Standards, ISO/IEC 12207 and ISO/IEC 15288 and their associated guides, do not explicitly address the needs of VSEs.
• Compliance with those standards is difficult (if not impossible) for VSEs to achieve.
• VSE’s have no or very limited ways to be recognized as an enterprise that produces quality software systems in their domain.
  – VSEs are cut off from some economic activities.
• Implementation of current standards requires a significant critical mass in terms of number of employees, cost and time.
• VSEs cannot see a net benefit in establishing a software process as defined by current standards.

Source: New Work Item Proposal
IEEE User’s Survey
Implementation Difficulties

• Benefits of implementation not clearly understood
• Cost
• Lack of templates, implementation checklists.
• Not enough useful examples
• Compliance determination

Source: Kathy Land, 1997
IEEE Users’ Survey
Requested Support Items

- User training course
- Examples of deliverables
- Deliverable templates
- CASE tool support for documentation generation
- On-line or phone support
- Software Engineering Standards newsletter
- Software Engineering Standards users group
- Educators resource/support

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ISO/IEC JTC 1/SC7
Terms of Reference
Standardization of processes, supporting tools and supporting technologies for the engineering of software products and systems.
SC7 - An Horizontal Committee

- Project Management
- Industrial Engineering
- Quality Management (ISO TC 176)
- Computer Sciences and Engineering
- Dependability Engineering (IEC TC 56)
- Safety (IEC TC65), Security, other mission-critical

APPLICATION DOMAINS (many TCs)

Source: F Coallier
SC7 Structure

Adapted from: Prof. M. Azuma
Standards Produced and Maintained by SC7
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SC7 Meeting in Australia - 2004

- Canada raised the fact that small enterprises require standards adapted to their size and maturity,
- A meeting of interested parties was held with delegates from 5 national bodies (Australia, Canada, Czech Republic, South Africa, and Thailand),
- **Consensus:**
  - Make the current software engineering standards more accessible to VSEs;
  - Provide turn key material that require minimal tailoring and adaptation effort;
  - Provide harmonized products that integrate available standards:
    - Process standards
    - Work product and deliverables
    - Assessment and Quality.
SC7 Meeting in Australia - 2004

• **Consensus**
  – Generate multiple profiles from elements of ISO standards.
  – Align, if desirable, profiles with the notions of maturity levels presented in ISO/IEC 15504.

• **Establishment of a Special Interest Group to develop:**
  – A statement of requirements;
  – The outline of key deliverables, and the associated process to create them (e.g. how to create profiles);
  – A Terms of Reference for the work group;
  – An example of a simple profile.
1st Meeting - Thailand – March 2005

• Hosted by the Thailand Industrial Standard Institute (TISI) and the Thai Software Industry Promotion Agency (SIPA),

• Representatives
  – Australia, Belgium, Brazil, Canada, Czechoslovakia, Finland, South Africa, South Korea, USA and Thailand.

• Outputs
  – Draft New Work Item
    • Schedule;
    • Product Plan;
  – Initial requirements document;
  – Project vision and strategies;
Examples of ISO/IEC 12207 Issues and Proposed Solutions

SMEs are not ready to implement the whole 12207 standard. ⇒ Standard should be broken down into stages or levels in order to fit all sizes of SMEs.

Not all 12207 activities are suitable for SMEs’ operations. ⇒ Need to modify activities to suit SMEs’ operation – product and project based type of business.

There is no assessment model. ⇒ A set of checklist was developed for use by assessors.

Most software developers are not document-oriented. ⇒ Provide packaged templates and examples for rapid documenting.

Source: Thai Software Industry Promotion Agency
Thai Quality Software (TQS) Standard

• Introduced by the Association of Thai Software Industry (ATSI).

• Adapted from ISO/IEC 12207 Software Life Cycle Processes Standard to:
  • Instill discipline for software developers,
  • Guide in software engineering processes and assures quality software.

• Divided into 5 stages:
  • Software practices (ISO/IEC 12207)
  • Organizations are assessed for certification at each stage

• Currently (March 2005)
  • 43 software organizations have been certified TQS level 1, and 11 software organizations have been certified TQS level 2.
Target Market of a Future ISO/IEC Collection of Standard and Associated Guides

• The collection should be based on the SE needs of the majority of the VSEs (market driven).
• The collection should initially focus on lower levels of maturity.
• The collection should be applicable to small teams or projects (small-scale software development).
• The use of the collection should enable multiple VSEs to work together (teaming arrangements) or work with a prime contractor.
Potential Benefits for VSEs

- The use of the collection should contribute to the reduction of risk
  - Business, cost, schedule and quality
- The use of the collection should facilitate alignment of the IT strategy to the business objectives.
- The collection should help understand and appreciate the value added (short and long term).
- The collection should offer guidance on quantifying the benefits of standards implementation.
  - The collection should include a measure of increased productivity and quality.
VSE Proposed Model

ISO90003

ISO/IEC 12207

ISO/IEC 15288

ISO/IEC 15504-5
Annex B
(Generic and Specific Work Products)

Decomposed Parts
(Tasks, Activities, Work Products)

Levels for SME
(Descriptions)

Leveled Profile for SME
(Composed Parts with Purposes and Outcome)

Guidelines for implementation and assessment of Leveled Profile

ISO/IEC 15504-5
Assessment Model

ISO90003, etc.

CMMI - Staged Representation,
CMM - SW LOGOS,
ISO/IEC 15504-2

Source: New Work Item Proposal
Estimated Schedule of Activities

ISO JTC1 Process

- NWI v1: 2005-03-18
- NWI v2: 2005-05
- Project Approval: 2005-11
- WD1: 2006-05
- CD 1: 2007-06
- FCD: 2007-11

Shadow Process

- Perf. Surveys: 2005-10
- Analyse Surveys: 2005-12
- Prioritize Proc.: 2006-03
- Validate WP: 2007-03

- Dev. Profiles: 2006-06
- Pilot Roadmaps: 2006-12
- Dev. Assessment: 2006-06
- Dev. Guidelines: 2006-06
- Prep. Pres. Mat.
- SC7 & VSE
- Dev. Bus. Case
SC7 Meeting in Finland – May 2005

• Proposal developed in Thailand was reviewed
  – Recommendation: To establish a new Working Group
• Resolution was approved to ballot the New Work Item Proposal
  – *Software Life Cycle Profiles and Guidelines for use in Very Small Enterprises (VSE)*
• Many countries voted in favour of the NWI Proposal
• Working Group 24
  – Mr. Tanin Uthayanaka (Thailand) was appointed Convener.
  – Mr. Jean Bérubé (Canada) was appointed Secretary.
  – Mr. Claude Y. Laporte (IEEE CS) was appointed Project Editor
2nd Meeting - Thailand – September 2005

• Hosted by the Thailand Industrial Standard Institute and the Thai Software Industry Promotion Agency

• Representatives
  – Australia, Belgium, Canada, Finland, Japan, Luxembourg, South Africa, USA and Thailand.

• Outputs
  – Requirements for International Standardised Profiles (ISPs) and supporting documents (e.g. guides);

    • Profile
      – A set of one or more base standards and/or ISPs, and, where applicable, the identification of chosen classes, conforming subsets, options and parameters of those base standards, or ISPs necessary to accomplish a particular function
        » Source: ISO/IEC TR 10000-1
      – Annotated initial Survey on VSEs exposure and needs for software development lifecycles;

2nd Meeting - Thailand – September 2005

• Outputs
  – Proposed approaches to document development and architecture;
    • Proposed business models;
    • Proposed situational factors
  – Proposed agenda for the WG 24 Bari interim meeting;
  – Proposed strategic plan for WG 24;
  – Proposed goals of the standard.
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  – Bari (Italy), October 24-28.
  – Commitment to participate to Working Group 24:
    • Belgium, Canada, Czech Republic, Ireland, Italy, Japan,
      Korea, Luxemburg, South Africa, Thailand, UK, USA.
Bibliography
