The Development of Software and Systems Engineering International Standards for Very Small Entities

Professor Claude Y. Laporte, Eng., Ph.D.
Editor of ISO/IEC JTC1 SC7 Working Group 24
Universidad de Belgrano, Argentina
November 14, 2012
1. Introduction
2. ISO Standards and ISO/IEC JTC1 Sub Committee 7
3. Development of ISO/IEC 29110 Standards and Guides for Very Small Entities (VSEs)
4. Tools developed to accelerate the diffusion of ISO/IEC 29110
5. ISO/IEC 29110 Systems Engineering Standards and Guides
6. ISO/IEC 20000 Standard (IT Service Management) in VSEs
7. Next Steps
8. Conclusion

VSEs = Very Small Entities are enterprises, projects or departments having up to 25 people.
École de Technologie Supérieure (ÉTS)
École de technologie supérieure

Engineering school of over 6,500 students
2200 paid industrial internships in over 900 companies.
Students are paid about 36,500$ for 3 internships of 4 months

Undergraduate Programs
• Software Engineering
• IT Engineering
• Construction Engineering
• Production Engineering
• Electrical Engineering
• Mechanical Engineering
• Logistics and Operations Engineering

• 600 students (400 in Software Eng.)
• 20 Professors in the department have a mean industrial experience of 10 years.

Graduate Programs
• Software Engineering
• Information Technology
• Other programs

175 students.

www.etsmtl.ca
Size of Enterprises

- European Union
  - 93% are micro enterprises (less than 10 employees)
- Micro enterprises account for 70% to 90% of enterprises in OECD* countries (about 57% in USA)
- Greater Montréal Area - Software Enterprises.

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>Number of Software Enterprises</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 25</td>
<td>540</td>
<td>78%</td>
</tr>
<tr>
<td>25 to 100</td>
<td>127</td>
<td>18%</td>
</tr>
<tr>
<td>Over 100</td>
<td>26</td>
<td>4%</td>
</tr>
</tbody>
</table>

About 50% of enterprises have less than 10 employees
Source: Montreal International, 2006

* OECD: Organisation for Economic Co-operation and Development
Observations, Vision and Strategy

• Observations
  – Most software engineering standards have not been designed having in mind VSEs;
  – VSEs’ negative perceptions of software engineering standards are primarily driven by negative views of cost, documentation and bureaucracy;
  – In many VSEs software processes are ad hoc and chaotic;
  – Worldwide, VSEs’ software products are very important to the economy.

• Vision
  – VSEs worldwide are using, in their daily development activities, software engineering standards, adapted to their needs, which guide them develop required products, constantly improving their performances and their competitiveness.

• Strategy
  – Participate actively to the development of international software engineering standards adapted for VSEs;
  – Lead the development of means to accelerate the adoption and implementation of new standards by VSEs;
  – Lead the development of educational material to teach the standards to undergraduate and graduate software engineering students;
A software defect from one of the producers went into a product and resulted in a loss of over $200 million by the manufacturer.
Components of Project Cost

- Project Cost
  - Cost of Quality
    - Cost of Conformance
      - Appraisal Costs
        - Reviews
        - Inspections
        - Testing
        - IV&V
        - Audits
      - Prevention Costs
        - Training
        - Methodologies
        - Tools
        - Data gathering
  - Cost of Performance
    - Generation of plans
    - SW Development
    - Fixing defects
    - Re testing
    - Re-reviews
    - Updating source code
    - Modifying documents

Adapted from (Haley et al., 1995)
Exercise - Cost of Quality of your Projects

• **Quality Cost Breakdown**
  – From your project(s), can you provide an estimate (%) for the components of this equation (definitions are listed at the bottom of the page, a detailed list is on the next page):
    – **Quality Costs** = Failure Costs + Appraisal Costs + Prevention Costs
      • Failure Costs = ________ %
      • Appraisal Costs = ________ %
      • Prevention Costs = ________ %
      • **Total Quality Costs** = ________ %

    – **Performance Cost** = 100 % - (Quality Costs) = ________ %

• **Quality of code delivered**
  – Can you provide an estimate of the number of defects in the software produced in your organization:
    • ________ Defects per 1000 Lines of Code (LOC)
## Cost of Quality

- **Data from Professional Software Engineers**

<table>
<thead>
<tr>
<th></th>
<th>Site A American Engineers (19)</th>
<th>Site A American Managers (5)</th>
<th>Site B European Engineers (13)</th>
<th>Site C European Engineers (14)</th>
<th>Site D European Engineers (9)</th>
<th>Course A 2008 (8)</th>
<th>Course B 2008 (14)</th>
<th>Course C 2009 (11)</th>
<th>Course D 2010 (8)</th>
<th>Course E 2011 (15)</th>
<th>Course F 2012 (10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of performance</td>
<td>41%</td>
<td>44%</td>
<td>34%</td>
<td>31%</td>
<td>34%</td>
<td>29%</td>
<td>43%</td>
<td>45%</td>
<td>45%</td>
<td>34%</td>
<td>40%</td>
</tr>
<tr>
<td>Cost of rework</td>
<td>30%</td>
<td>26%</td>
<td>23%</td>
<td>41%</td>
<td>34%</td>
<td>28%</td>
<td>29%</td>
<td>30%</td>
<td>25%</td>
<td>32%</td>
<td>31%</td>
</tr>
<tr>
<td>Cost of appraisal</td>
<td>18%</td>
<td>14%</td>
<td>32%</td>
<td>21%</td>
<td>26%</td>
<td>24%</td>
<td>18%</td>
<td>14%</td>
<td>20%</td>
<td>27%</td>
<td>20%</td>
</tr>
<tr>
<td>Cost of prevention</td>
<td>11%</td>
<td>16%</td>
<td>11%</td>
<td>8%</td>
<td>7%</td>
<td>14%</td>
<td>10%</td>
<td>11%</td>
<td>10%</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>Quality</td>
<td>71</td>
<td>8</td>
<td>23</td>
<td>35</td>
<td>17</td>
<td>403</td>
<td>19</td>
<td>48</td>
<td>35</td>
<td>60</td>
<td>55</td>
</tr>
</tbody>
</table>

**Quality** = Number of Defects/1,000 Lines of Code
## Definition of the CoSQ Categories

<table>
<thead>
<tr>
<th>Major categories</th>
<th>Subcategories</th>
<th>Definition</th>
<th>Typical costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention cost</td>
<td>Quality basis definition</td>
<td>Effort to define quality, and to set quality goals, standards, and thresholds. Quality trade-off analysis.</td>
<td>Definition of release criteria for acceptance testing and related quality standards</td>
</tr>
<tr>
<td></td>
<td>Project and process-oriented interventions</td>
<td>Effort to prevent poor product quality or improve process quality</td>
<td>Process improvement, updating of procedures and work instructions; metric collection and analysis; internal and external quality audits; training and certification of employees</td>
</tr>
<tr>
<td>Evaluation or appraisal cost</td>
<td>Discovery of the condition of the product</td>
<td>Discovery of the level of Non conformance.</td>
<td>Test, walk-through, inspection, desk-check, quality assurance</td>
</tr>
<tr>
<td></td>
<td>Ensuring the achievement of quality.</td>
<td>Quality control gating</td>
<td>Contract/proposal review, product quality audits, “go” or “no go” decisions to release or proceed, quality assurance of subcontractor</td>
</tr>
<tr>
<td>Cost of anomalies or non conformance</td>
<td>Internal anomalies or non conformance</td>
<td>Problem detected before delivery to the customer</td>
<td>Rework (e.g. recode, retest, re review, re document, etc.)</td>
</tr>
<tr>
<td></td>
<td>External anomalies or non Conformance</td>
<td>Problem detected after delivery to the customer</td>
<td>Warranty support, resolution of complaints, reimbursement damage paid to customer, domino effect (e.g. other projects are delayed), reduction of sales, damage to reputation of enterprise, increased marketing</td>
</tr>
</tbody>
</table>

Adapted from (Krasner 1998 and Houston 1999)
ISO/IEC 12207 Life Cycle Processes Standard System Context

**Agreement**
- Acquisition Process
- Supply Process

**Organizational Project-Enabling**
- Life Cycle Model Management Process
- Infrastructure Management Process
- Project Portfolio Management Process
- Human Resource Management Process
- Quality Management Process

**Project**
- Project Planning Process
- Project Assessment and Control Process
- Decision Management Process
- Risk Management Process
- Configuration Management Process
- Information Management Process
- Measurement Process

**Technical**
- Stakeholder Requirements Definition Process
- System Requirements Analysis Process
- System Architectural Design Process
- Implementation Process
- System Integration Process
- System Qualification Testing Process
- Software Installation Process
- Software Acceptance Support Process
- Software Operation Process
- Software Maintenance Process
- Software Disposal Process

(From cradle to grave)

(ISO 12207)

• **Purpose**
  – To establish and maintain the integrity of the software items of a process or project, and make them available to concerned parties.

• **Outcomes**
  – As a result of the successful implementation of the Software Configuration Management Process:
    • a software configuration management strategy is developed;
    • *items* generated by the process or project are identified, defined, and baselined;
    • *modifications and releases* of the items are controlled;
    • *modifications and releases* are made available to affected parties;
    • the *status* of the items and modifications is recorded and reported;
    • the *completeness and consistency* of the items is ensured; and
    • the *storage, handling, and delivery* of the items are controlled.

• Activities and Tasks
  1. Process implementation (Activity)
     • This activity consists of the following task:
       – A software configuration management plan shall be developed.
       – The plan shall describe:
         » the configuration management activities; procedures and schedule for performing these activities;
         » the organization(s) responsible for performing these activities; and their relationship with other organizations, such as software development or maintenance.
       – The plan shall be documented and implemented.
     • NOTE The plan may be a part of the system configuration management plan.
  2. Configuration identification
  3. Configuration control
  4. Configuration status accounting
  5. Configuration evaluation
  6. Release management and delivery
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Portfolio of SC7 Standards and Guides

Governance
- 9001 Quality System
- 38500 Governance Governance

Foundation
- 24765 Vocabulary
- 24774 Process Description

BOK and Professionalism
- 16337 19759 BOK
- 24773 29154 Certification

Life Cycle
- 15288
- 24748-2
- 24748-4
- 90005 Systems Engineering
- 12207
- 24748-3
- 90003 Software Engineering
- 29110 Very Small Entities

Process Implementation and Assessment
- 29148
- 242010 242030 Requirements Architecture
- 29119 Testing
- 14764 Software Maintenance
- 16326 Project Management
- 15026 16085 Risk and Integrity Measurement
- 15939 29155

Assessment and Certification
- 15504
- 330xx
- 29169 Process Assessment
- 19770-1,5,8 Asset Mgmt

IT Service Management
- 20000
- 90006

Product Characteristics
- 9126
- 14598
- 14756 Software Quality
- 25000 Series (20 Parts)
- Software Quality SQuaRE
- 14143 19761 20926 20968 24570 29881 Software Functional Size Measurement

Tools and Methods
- 3535, 5806 5807, 8631 8790, 11411 12182, 14759 SC7 Legacy Standards
- 14102, 14471 15940, 18018 23026, 24766 26500, 26501 Tools, Methods, and Environment
- 10746, 13235 14750, 14752 14753, 14769 14771, 15414 19500 19770-2,3,6,7 Specifications
- 8807, 15437 15909, 19501, 19505, 19793, 24744, 19505, 19507 Modeling
- 14568 15474 15475 15476 15906 Interchange

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_tc_browse.htm?commid=45086 (SC7 WG5)
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International Organization for Standardization

ISO JTC1 IEC

Joint Committee for IT

Sub committee (SC) 7

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

Working Group (WG) 24

INCOSE AFIS IEEE
Development of International Standards for VSEs

- Phase 2 - Basic and Applied Research (2005-2006)
- Phase 3 - Development (2006-2010)
- Phase 4 - Commercialization (2010)
- Phase 5 - Diffusion and Adoption (2006 - )
- Phase 6 - Consequences (2011 - )

Adapted from (Rogers 2003)
Survey of VSEs

• **Objectives**
  • Identify utilization of standards by VSEs
  • Identify problems and potential solutions to help VSEs apply standards and become more capable and competitive.

• **Method**
  • Web-based Survey
  • Questionnaire translated in 9 languages
    • English, French, German, Korean, Portuguese, Russian, Spanish, Thai and Turkish.
  • Invitation to participate in survey widely broadcasted via:
    • WG 24 Network of contacts
    • Centers and initiatives focused on SMEs/VSEs
      – e.g., SIPA (Thailand), CETIC (Belgium), Parquesoft (Colombia)
Over 435 Responses from 32 Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of Responses</th>
<th>Country</th>
<th>Number of Responses</th>
<th>Country</th>
<th>Number of Responses</th>
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</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>2</td>
<td>Finland</td>
<td>13</td>
<td>New Zealand</td>
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<td>Australia</td>
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<td>France</td>
<td>4</td>
<td>Peru</td>
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<td>Russia</td>
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<td>Brazil</td>
<td>72</td>
<td>India</td>
<td>57</td>
<td>South Africa</td>
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<td>Bulgaria</td>
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<td>Ireland</td>
<td>10</td>
<td>Spain</td>
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<td>Canada</td>
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<td>Italy</td>
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<td>Taiwan</td>
<td>1</td>
</tr>
<tr>
<td>Chile</td>
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<td>Japan</td>
<td>3</td>
<td>Thailand</td>
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<td>Colombia</td>
<td>109</td>
<td>Korea (South)</td>
<td>4</td>
<td>Turkey</td>
<td>1</td>
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<tr>
<td>Czech Republic</td>
<td>3</td>
<td>Luxembourg</td>
<td>3</td>
<td>United Kingdom</td>
<td>2</td>
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<td>Dominican Republic</td>
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<td>Mexico</td>
<td>20</td>
<td>United States</td>
<td>3</td>
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<tr>
<td>Ecuador</td>
<td>9</td>
<td>Morocco</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Why don't VSEs use Standards?

- Not required: 24%
- Lack of support: 15%
- Lack of resources: 14%
- Too time-consuming: 10%
- Standard(s): 9%
- Other: 10%

* Difficult, Bureaucratic, not enough guidance.
Requests from VSEs

• Certification and Recognition
  • Only 18% are certified
    • Over 53% of larger companies are certified
  • Over 74% indicated that it was important to be either recognized or certified
    • ISO certification requested by 40%.
    • Market recognition requested by 28%
    • Only 4% are interested in a national certification

• Needs Regarding Documentation
  • 62% are asking for more guidance and examples
  • 55% are requiring 'lightweight' standards that are easy to understand and apply and come with templates.
The Strategy of WG 24
To develop standards and guidelines

- Focus first on VSEs developing Generic software
  - i.e. VSEs not developing critical software products.

- Use the notion of ‘Profile’ to develop a roadmap to meet the needs of VSEs.
  - A profile is an ‘assemblage’ from one or more base standards to accomplish a particular function.

- Use two types of standards, as the input, for the development of standards for VSEs:
  - Process standards, such as ISO 12207, that define the activities required to achieve identified objectives or outcomes;
  - Product standards, such as ISO 15289, that define the structure and content of artefacts produced by the processes;

- Develop a set of documents to describe and specify the profiles.
  - Standards (IS) and Technical Reports (TR)
The Generic Profile Group

3. Development

- **Entry** - Targets VSEs typically developing 6 person-month projects or start-ups;
- **Basic** - Targets VSEs developing only one project at a time;
- **Intermediate** – Targets VSEs developing multiple projects within the organizational context;
- **Advanced** – Targets VSEs which want to sustain and grow as an independent competitive software development business.

(ISO/IEC 29110)
Spectrum of Development Approaches

- **Waterfall**
  - Few risks, sequential
  - Late integration and testing

- **Low Ceremony**
  - Little documentation
  - Light process

- **High Ceremony**
  - Well-documented
  - Traceability
  - CCB

- **Iterative**
  - Risk-driven
  - Continuous Integration and testing

Adapted from (Kroll 2003)
ISO 29110 Documents Targeted by Audience

29110 Overview (TR 29110-1)

For VSEs and Customers

29110 Profiles (IS)

Framework and Taxonomy (IS 29110-2)

For Standard producers, tool vendors, methodology vendors

Specifications of VSE Profiles (IS 29110-4)

List the Requirements i.e. ‘What to do’

Specification - VSE Profile Group m
(IS 29110-4-m)

29110 Guides (TR)

Assessment Guide (TR 29110-3)

For VSEs and Customers

Management and Engineering Guide (TR 29110-5)

Management and Engineering Guide
VSE Profile m-n
(TR 29110-5-m-n)

For VSEs and Customers

‘How to do’

(ISO/IEC 29110)

http://www.iso.org/iso/home/search.htm?qt=29110&sort=rel&type=simple&published=on
## Comments Processed by Working Group 24

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>TR 29110-1 Overview</td>
<td>71</td>
<td>61</td>
<td>60</td>
<td>37</td>
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<tr>
<td>IS 29110-2 Framework and Profile Taxonomy</td>
<td>33</td>
<td>94</td>
<td>52</td>
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<td>TR 29110-3 Assessment Guide</td>
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<td>135</td>
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<td>IS 29110-4 Basic Profile Specification</td>
<td>52</td>
<td>54</td>
<td>54</td>
<td>84</td>
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<td>253</td>
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<td>TR 29110-5 Basic Profile - Management and Engineering Guide</td>
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<td>208</td>
<td>53</td>
<td>98</td>
<td>10</td>
<td>432</td>
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<td><strong>237</strong></td>
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</table>

**TR 29110-1 Overview**
- Berlin 2008: 71 comments
- Mexico 2008: 61 comments
- Hyderabad 2009: 60 comments
- Lima 2009: 37 comments
- Washington 2010: 9 comments
- Total: 238 comments

**IS 29110-2 Framework and Profile Taxonomy**
- Berlin 2008: 33 comments
- Mexico 2008: 94 comments
- Hyderabad 2009: 52 comments
- Lima 2009: 48 comments
- Washington 2010: 17 comments
- Total: 244 comments

**TR 29110-3 Assessment Guide**
- Berlin 2008: 18 comments
- Mexico 2008: 38 comments
- Hyderabad 2009: 40 comments
- Lima 2009: 31 comments
- Washington 2010: 8 comments
- Total: 135 comments

**IS 29110-4 Basic Profile Specification**
- Berlin 2008: 52 comments
- Mexico 2008: 54 comments
- Hyderabad 2009: 54 comments
- Lima 2009: 84 comments
- Washington 2010: 9 comments
- Total: 253 comments

**TR 29110-5 Basic Profile - Management and Engineering Guide**
- Berlin 2008: 63 comments
- Mexico 2008: 208 comments
- Hyderabad 2009: 53 comments
- Lima 2009: 98 comments
- Washington 2010: 10 comments
- Total: 432 comments

**Total**
- Berlin 2008: 237 comments
- Mexico 2008: 455 comments
- Hyderabad 2009: 259 comments
- Lima 2009: 298 comments
- Washington 2010: 53 comments
- Total: 1302 comments
ISO/IEC 29110
Management and Engineering Guide *

Customer

- Statement of Work
- Software Configuration

Project Management Process

- Planning
- Control
- Execution
- Closure

Implementation Process

- Initiation
- Analysis
- Design
- Construction
- Tests
- Delivery

Organizational Management

* Entry/Basic Profile

Adapted from (Varkoi, 2010)
Project Management Process – 4 Activities

15 Tasks
6 Tasks
3 Tasks
2 Tasks

(ISO/IEC 29110)
Project Management Process
Example of 2 Tasks of the Project Planning Tasks

<table>
<thead>
<tr>
<th>Role</th>
<th>Task List</th>
<th>Input Products</th>
<th>Output Products</th>
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</thead>
<tbody>
<tr>
<td>PM TL</td>
<td><strong>PM.1.1 Review</strong> the Statement of Work</td>
<td>Statement of Work</td>
<td>Statement of Work [<em>reviewed</em>]</td>
</tr>
<tr>
<td>PM CUS</td>
<td><strong>PM.1.2 Define</strong> with the Customer the Delivery Instructions of each one of the deliverables specified in the Statement of Work.</td>
<td>Statement of Work [<em>reviewed</em>]</td>
<td>Delivery Instructions</td>
</tr>
</tbody>
</table>

(ISO/IEC 29110)
Software Implementation Process – 6 Activities

2 Tasks

7 Tasks

8 Tasks

7 Tasks

11 Tasks

6 Tasks

(ISO/IEC 29110)
The Generic Profile Group

- **Entry** - Targets VSEs typically developing *6 person-month* projects or *start-ups* (less than 3 years);
- **Basic** - Targets VSEs developing only *one project at a time*;
- **Intermediate** – Targets VSEs developing *multiple projects* within the organizational context;
- **Advanced** – Targets VSEs which want to *sustain and grow* as an independent competitive software development business.

Entry Profile was published in September 2012

(ISO/IEC 29110)
# Entry Profile – PM Objectives

<table>
<thead>
<tr>
<th>Objective ID</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM.01</td>
<td>The <em>Project Plan</em> for the execution of the project is developed according to <em>the Statement of Work</em> and reviewed and accepted by the Customer. The tasks and resources necessary to complete the work are sized and estimated.</td>
</tr>
<tr>
<td>PM.02</td>
<td>Progress of the project monitored against the <em>Project Plan</em> and recorded in the Progress Status Record. Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Closure of the project is performed to get the Customer acceptance documented in the <em>Acceptance Record</em>.</td>
</tr>
<tr>
<td>PM.03</td>
<td>The <em>Changes Requests</em> are addressed, <strong>evaluated and tracked</strong> through their reception and analysis. Changes to the software requirements are evaluated for cost, schedule and technical impact.</td>
</tr>
<tr>
<td>PM.04</td>
<td>Review meetings with the Work Team and the Customer are held. Agreements are registered and tracked.</td>
</tr>
<tr>
<td>PM.05</td>
<td>Risks are identified as they develop and during the conduct of the project</td>
</tr>
<tr>
<td>PM.06</td>
<td>A software <em>Version Control Strategy</em> is developed. Items of <em>Software Configuration</em> are identified, defined and baselined. Modifications and releases of the items are controlled and made available to the Customer and Work Team. The storage, handling and delivery of the items are controlled. Items of Software Configuration are identified and controlled.</td>
</tr>
<tr>
<td>PM.07</td>
<td>Software Quality Assurance is performed to provide assurance that work products and processes comply with the <em>Project Plan and Requirements Specification</em>.</td>
</tr>
</tbody>
</table>

**Legend:** Information **added or modified** to the Basic Profile is shown in **blue** while information **deleted** is shown like this: **strike out.**

(ISO/IEC 29110)
## Entry Profile – SI Objectives

<table>
<thead>
<tr>
<th>Objective ID</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI.01</td>
<td>Tasks of the activities are performed through the accomplishment of the current <em>Project Plan</em>.</td>
</tr>
<tr>
<td>SI.02</td>
<td>Software requirements are defined, analyzed for correctness and testability, approved by the Customer, <em>baselined</em> and communicated.</td>
</tr>
<tr>
<td>SI.03</td>
<td><em>Software components are identified</em>. Software architectural and detailed design is developed and baselined. It describes the software components and internal and external interfaces of them. Consistency and traceability to software requirements are established.</td>
</tr>
<tr>
<td>SI.04</td>
<td><em>Software components defined by the design</em> are produced. Unit test are <em>defined and performed</em> to verify the consistency with software requirements and the design. Traceability to the requirements and design are established.</td>
</tr>
<tr>
<td>SI.05</td>
<td><em>Software</em> is produced. <em>Performing integration of software components are integrated</em> and verified using <em>Test Cases and Test Procedures</em>. Results are recorded in the <em>Test Report</em>. Defects are corrected and consistency and traceability to <em>Software Design</em> are established.</td>
</tr>
<tr>
<td>SI.06</td>
<td><em>Software configuration is prepared for delivery</em>. A <em>Software Configuration</em>, that meets the <em>Requirements Specification</em> as agreed to with the Customer, which includes user, operation and maintenance documentations is integrated, baselined and stored at the <em>Project Repository</em>. Needs for changes to the <em>Software Configuration</em> are detected and related <em>Change Requests</em> are initiated.</td>
</tr>
<tr>
<td>SI.07</td>
<td>Verification and Validation tasks of all required work products are performed using the defined criteria to achieve consistency among output and input products in each activity. Defects are identified, and corrected; records are stored in the <em>Verification/Validation Results</em>.</td>
</tr>
</tbody>
</table>

**Legend:** Information added or modified to the Basic Profile is shown in blue while information deleted is shown like this: strike-out.
Entry Profile Versus Basic Profile

Project Management Process

Entry Profile

- Project Planning
- Project Plan Execution
- Project Assessment and Control
- Project Closure

Basic Profile

- Project Planning
- Project Plan Execution
- Project Assessment and Control
- Project Closure

ISO/IEC 29110
Entry Profile Versus Basic Profile

Software Implementation Process

### Entry Profile

- **Project Plan**
- **Project Repository**
- **Software Implementation Initiation**
  - **Software Requirements Analysis**
    - Requirements Specification
    - Software Component Identification
  - **Software Component Identification**
    - Test Cases and Test Procedures
  - **Software Construction**
    - Software Components
  - **Software Integration and Tests**
    - Software
  - **Product Delivery**

### Basic Profile

- **Project Plan**
- **Project Repository**
- **Software Implementation Initiation**
  - **Software Requirements Analysis**
    - Requirements Specification
    - Validation Results
  - **Software Architectural and Detailed Design**
    - Test Cases and Test Procedures
  - **Software Construction**
    - Software Design
    - Traceability Record
  - **Software Integration and Tests**
    - Product Operation Guide
    - Software User Documentation
  - **Product Delivery**

(ISO/IEC 29110)
Content

1. Introduction
2. ISO Standards and ISO/IEC JTC1 Sub Committee 7
3. Development of ISO/IEC 29110 Standards and Guides for Very Small Entities (VSEs)
4. Tools developed to accelerate the diffusion of ISO/IEC 29110
5. ISO/IEC 29110 Systems Engineering Standards and Guides
6. ISO/IEC 20000 Standard (IT Service Management) in VSEs
7. Next Steps
8. Conclusion
5. Diffusion

Publication by ISO

- Commercialization begins when ISO publishes the Standard
  - ISO Working Groups are not involved in commercialization

- Needs of VSEs (from Survey)
  - Not completely fulfilled with ISO/IEC 29110 Part 5 - Engineering and Management Guide
  - VSEs requested readily usable processes

- The concept of Deployment Packages (DPS) - Moscow Meeting
  - To accelerate diffusion and adoption worldwide
    - By providing readily usable information and made freely available
      - e.g. detailed process descriptions (steps), templates, checklists, etc.
  - Linked to ISO/IEC 29110 Part 5 - Annex A
5. Diffusion

Rate of Diffusion/Adoption

Percent of Adoption

Later Adopters
- Diffusion Strategy X
- Diffusion Strategy Y
- Diffusion Strategy Z
- No Strategy

Take-Off

Earlier Adopters

Time (Years)

0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Network of Support Centers for VSEs

- **Objectives**
  - Help accelerate the development of ISO standards for VSEs
  - Accelerate deployment of VSE Standards
  - Accelerate the development and application of Deployment Packages

- Belgium (Cetic)
- Brazil
- Canada (ÉTS)
- Colombia (Parquesoft)
- Finland
- France (UBO)
- Haiti
- Honk Kong
- Ireland (LERO)
- Luxembourg (Tudor Research Center)
- Mexico
- Peru
- Thailand (Institute of Software Promotion for Industries)

http://profs.logti.etsmtl.ca/claporte/English/VSE/VSE-network.html
Deployment Packages (DPs)

• A Deployment Package (DP) is a set of artifacts developed to facilitate the implementation of a set of practices, of the selected framework, in a VSE.
  – Deployment packages are not intended to preclude or discourage the use of additional guidelines that VSEs find useful.
• By deploying and implementing a Deployment Package, a VSE can see its concrete step to achieve or demonstrate coverage to Part 5.
• Deployment Packages are designed such that a VSE can implement its content, without having to implement the complete framework at the same time.
Content of Deployment Packages

1. Technical Description
   Purpose of this document
   Why this topic is Important?

2. Definitions
   Generic Terms
   Specific Terms

3. Relationships with ISO/IEC 29110 Part 5

4. Description of Processes, Activities, Tasks, Steps, Roles and Products

5. Template

6. Example

7. Checklist

8. Tool


10. References

11. Evaluation Form

Deployment Packages are free!
Deployment Packages for the Software Basic Profile

- Construction and Unit testing
- Verification and Validation
- Integration and Tests
- Architecture and Detailed Design
- Product Delivery
- Version Control
- Self-Assessment
- Requirements Analysis
- Project Management
## Deployment Packages for the Software Basic Profile

<table>
<thead>
<tr>
<th>Title of Deployment Package</th>
<th>Developed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements Analysis</td>
<td>Belgium, Canada</td>
</tr>
<tr>
<td>Architecture and Detailed Design</td>
<td>Canada</td>
</tr>
<tr>
<td>Construction and Unit Testing</td>
<td>Mexico</td>
</tr>
<tr>
<td>Integration and Test</td>
<td>Columbia</td>
</tr>
<tr>
<td>Verification and Validation</td>
<td>Canada</td>
</tr>
<tr>
<td>Version Control</td>
<td>Thailand</td>
</tr>
<tr>
<td>Project Management</td>
<td>Ireland</td>
</tr>
<tr>
<td>Product Delivery</td>
<td>Canada, Thailand</td>
</tr>
<tr>
<td>Self-Assessment</td>
<td>Finland</td>
</tr>
</tbody>
</table>

- **Additional DP:** Conduct of [Pilot Projects DP](http://profs.logti.etsmtl.ca/claporte/English/VSE/VSE-packages.html) (Canada, Uruguay) *

---

http://profs.logti.etsmtl.ca/claporte/English/VSE/VSE-packages.html
Plug-in for the Design Deployment Package

Welcome

Welcome to the ISO/IEC 29110 Basic profile Deployment Package for "Software Architectural and Detailed Design"!

Main Description

This is an implementation of the ISO/IEC 29110 Basic Profile Deployment Package (DP) for "Software Architectural and Detailed Design". It is basically an experiment to try the Eclipse Process Framework (EPF) as a means to deploy the 29110 DPs in web format.

This work concentrates on the Design DP. Consequently:

- only the roles, tasks and guidance related to Design are included;
- although all work products of the basic profile have been captured, only the "Software Design" work product is described in detail;
- this work was done in isolation from work on other DPs. An extensible architecture where the Basic profile could be defined in a central location and each DP developed independently is under investigation for future work and harmonious and efficient integration of other DPs in the EPF format.

This version (0.4) of the "Software Architectural and Detailed Design" Deployment Package revised and converted to the Eclipse Process Framework (EPF) format by:

Roger Champagne, Eng., Ph. D.
Associate Professor, Department of Software and IT Engineering
École de technologie supérieure (ÉTS), Montreal, Canada
E-mail: roger.champagne@etsmtl.ca

Developed by Prof. Roger Champagne, ÉTS

http://profs.etsmtl.ca/claporte/VSE/Trousses/29110-5-1-2-Design_Plugin.zip
5. Diffusion

**Education Interest Group**

- **Concept:** [Deployment Packages](#) for Education
- **Proposed at the Hyderabad meeting (May 2009):**
  - To help educators teach the future ISO standards for VSEs by developing and providing at no cost educational material,
  - To sensitize undergraduate and graduate students to the ISO standard for VSEs.

- **Courses to Support ISO 29110 Standards and Technical Reports**
  1. Introduction to ISO/IEC Software Engineering Standards (Ireland)
  2. Introduction to the ISO/IEC 29110 Standards, Technical Reports and Deployment Packages for VSEs (Canada)
  5. Self-Assessment of an ISO/IEC 29110-Based Software Process
  6. Conduct Deployment of ISO/IEC 29110 Standard in a VSE (Canada)

[http://profs.logti.etsmtl.ca/claporte/English/VSE/VSE-Education.html](http://profs.logti.etsmtl.ca/claporte/English/VSE/VSE-Education.html)
Pilot Projects

• **Definition**
  – A method for **exploring the value** of a new technological concept via an objective study conducted in a somewhat realistic setting (adapted from Glass 1997).

• **Successful pilot project** is also an effective means of **building adoption of new practices** by members of a VSE.

• To be credible, the pilot projects should satisfy the following requirements (Fenton 1994):
  – The pilot project experiment has to be designed correctly,
  – The pilot project has to be performed in a real situation.
  – It is not a toy project, i.e. an artificial problem in an artificial situation,
  – The measurements have to be appropriate to the goals of the experiment,
  – The experiment has to be run for long enough.

* To develop a **solid business case** to promote the adoption of ISO 29110 by VSEs, **locally** and **internationally**.

http://profs.logti.etsmtl.ca/claporte/English/VSE/VSE-pilot.html
Pilot Projects Completed in Canada - 1

• **Pilot Project in a Computer Aided Design (CAD) Software Support Organisation**
  – Distributes and supports three types of software products:
  – Products serve mainly the aerospace and the automobile industries.
  – Defined the tasks of 4 developers and undertook to improve the following processes:
    • Project management, Software configuration management, Issue tracking and Requirements management

• **Project at a School Organization of the Montréal Area**
  – Represents 54 primary schools, 14 secondary schools, 2 general training centers and 4 vocational training centers.
    • Over 8,000 employees,
  – IT department with a staff of 4: 1 analyst and 3 developers.
  – Studied, translated and implemented 3 DPs:
    • Software Requirements, Version Control, Project Management
Pilot Projects Completed in Canada - 2

- **Software Engineering Graduate students – SQA Course** *
  - **Insurance Company**
    - French global insurance companies group headquartered in Paris.
    - IT staff of 11 in Montréal
  - **Support Organisation for Notaries**
    - Support the notary profession's transition into a virtual environment
      - 3,200 notaries in Québec
    - Organisation of 70 people
    - IT staff of 8
  - **Geographic Information System Modeling Company**
    - Leader in modeling and mapping software and technology
    - Organisation of 1,000 employees
    - IT staff of 6 in Montréal
  - **Support Organisation for Lawyers**
    - Organisation of 200 employees: IT staff of 5
  - **University Research Laboratory**
    - Research Laboratory of a Business School
    - ERP simulation (e.g. SAP)

* In each team, one student is a staff of the Organisation
Pilot Projects Completed in Canada - 3

• **Acme Software for Building Maintenance**
  – VSE of 8 in Canada and 3 in France.
  – Will pilot verification practices: code review and requirements inspection

• **Acme Insurance**
  – About 300 staffs.
  – QA department of 20
  – Will pilot configuration management practices

• **Acme Security**
  – Develop security platforms
  – VSE of 29 employees
  – Will pilot requirements practices in the R&D group of 9 software developers

• **Acme Web Site Development**
  – Develop internet sites
  – VSE of 25 employees
  – Will pilot test practices

• **Acme Communications**
  – VSE of 25 employees spread in 2 cities
  – IT staff of 2
  – Will pilot requirements practices

*In each team, one student is a staff of the Organisation*
Pilot Projects Underway in Canada

• Start-up Company of 2 People
  • Involved in the development of web services for travelers
    • To help travelers throughout the life cycle of a trip from its initial planning to sharing the experience of the traveler with friends.
  • Used the Basic software engineering Profile of ISO 29110
    • Roles have been allocated

<table>
<thead>
<tr>
<th>Role</th>
<th>Identification of team member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyst</td>
<td>A</td>
</tr>
<tr>
<td>Designer</td>
<td>B</td>
</tr>
<tr>
<td>Programmer</td>
<td>A/B</td>
</tr>
<tr>
<td>Project Manager</td>
<td>B</td>
</tr>
<tr>
<td>Technical Leader</td>
<td>A</td>
</tr>
<tr>
<td>Work Team</td>
<td>A/B</td>
</tr>
</tbody>
</table>
Pilot Projects Underway in Canada

- Start-up Company of 2 People
  - Allocation of documents to the two-people VSE,
  - As the VSE grows, the set of roles will be attributed amongst all people of the VSE.

<table>
<thead>
<tr>
<th>Name of document</th>
<th>Main author</th>
<th>Reviewer (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change Request</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Correction Register</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Maintenance Documentation</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Meeting Record</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Product Operation Guide</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Progress Status Record</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Project Plan</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Project Repository</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Project Repository Backup</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Requirements Specification</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Software</td>
<td>A/B</td>
<td></td>
</tr>
<tr>
<td>Software Components</td>
<td>A/B</td>
<td></td>
</tr>
<tr>
<td>Software Configuration</td>
<td>A/B</td>
<td></td>
</tr>
<tr>
<td>Software Design</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Software User Documentation</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Statement of Work</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Test Cases and Test Procedures</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Test Report</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Traceability Record</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Verification Results</td>
<td>A/B</td>
<td></td>
</tr>
<tr>
<td>Validation Results</td>
<td>A/B</td>
<td></td>
</tr>
</tbody>
</table>
Pilot Projects completed in Canada

• **Large Engineering Company - 1**
  - Offers a range of services in the production of hydro-electric, wind, geothermal, solar or biomass-related energy.
  - Company established 10 years ago,
  - Over 260 employees spread over 10 offices in Canada,

<table>
<thead>
<tr>
<th>Identification Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-1</td>
<td>Facilitate the integration of new project managers.</td>
</tr>
<tr>
<td>O-2</td>
<td>Reach an overall customer satisfaction level 80%.</td>
</tr>
<tr>
<td>O-3</td>
<td>On average projects should reach cost and schedule targets within 5%</td>
</tr>
<tr>
<td>O-4</td>
<td>Reduce overload of staff by 10%</td>
</tr>
<tr>
<td>O-5</td>
<td>Reduce schedule slippage to less than one week and 5% of initial cost for mismanaged risks of projects</td>
</tr>
<tr>
<td>O-6</td>
<td>Reduce rework by 10%</td>
</tr>
<tr>
<td>O-7</td>
<td>Reduce non billable hours by 10%</td>
</tr>
</tbody>
</table>

Translated and adapted from (Chevalier 2012)
Pilot Projects completed in Canada

- Large Engineering Company - 2
  - Developed 3 project management processes, checklists and templates
    - Process for Small projects used ISO/IEC 29110 Entry Profile
    - Process for Medium projects used ISO/IEC 29110 Basic Profile
    - Process for Large projects used the Guide to the project management body of knowledge (PMBOK® Guide) of PMI

<table>
<thead>
<tr>
<th>Duration of project</th>
<th>Small Project</th>
<th>Medium project</th>
<th>Large project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2 months</td>
<td></td>
<td>Between 2 and 8 months</td>
<td>More than 8 months</td>
</tr>
<tr>
<td>Equal or less than 4 people</td>
<td></td>
<td>Between 4 and 8 people</td>
<td></td>
</tr>
<tr>
<td>One specialty</td>
<td></td>
<td>More than one specialty</td>
<td></td>
</tr>
<tr>
<td>Between 5,000$ and 70,000$</td>
<td></td>
<td>Between 50,000$ and 350,000$</td>
<td>Over 350,000$</td>
</tr>
</tbody>
</table>

Translated and adapted from (Chevalier 2012)
Pilot Projects completed in Canada

• Large Engineering Company – 3
  • Cost analysis using the ISO method to evaluate the *Economical Benefits of Standards*
  • Value chain

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost to implement and maintain</td>
<td>59 600$</td>
<td>50 100$</td>
<td>50 100$</td>
<td>159 800$</td>
</tr>
<tr>
<td>Net Benefits</td>
<td>255 500$</td>
<td>265 000$</td>
<td>265 000$</td>
<td>785 500$</td>
</tr>
</tbody>
</table>

Translated and adapted from (Chevalier 2012)
Science and Technology Clubs of Students of ETS using ISO 29110

• **Autonomous Land Robots**
  – These robots have a laser rangefinder that scans the horizon and can detect obstacles up to 30 meters. A GPS system can determine their exact position at all times, which allows on-board computers to make the best possible decisions.

• **Engineering of Mobile Applications**
  – Students who share a common interest in the field of telecommunications and mobile applications.

• **Video game development**
  – Start-up VSE
Pilot Projects Underway in Canada - 1

• An Engineering Company
  • Involved in the design and manufacturing of process control for heating, air conditioning, refrigeration systems, nuclear and paper sectors,
  • Department of 13 people is responsible for systems integration
    • Develops software to adapt current products to specific needs of customers
  • Objectives of the process improvement project
    • Evaluate the current process against the Entry profile of ISO/IEC 29110,
    • Propose improvements to the current process,
    • Document the new process,
    • Evaluate the proposed process as part of a pilot project,
    • Train department on the new process.
Pilot Projects Underway in Canada - 2

• A Start-up company in the transportation domain (e.g. subway/metro)
  • Application of the Basic profile in systems and software engineering

• A VSE of 12 people involved in the design of embedded systems
  • Application of the Basic profile in systems engineering
  • Application in an Agile approach (Scrum)

• Implementation of ISO/IEC 29110 in education
  • Undergraduate courses in software quality assurance of ETS,
  • Graduate course in quality assurance and process improvement of ETS, UQAM,
  • Technical College in IT,
  • Undergraduate course in software quality assurance in Haiti.
Pilot Projects Underway in Haïti in collaboration with Canada

- Development of a web application which manages a library of the *Institut Universitaire Quisqueya-Amérique*
- Development of a distributed computing platform for use by the Haitian education sector
- Teaching ISO 29110 standard to undergraduate students (Software Quality Assurance course)
  - Computer science students preparing their ‘capstone’ project.
  - Assessment of the development process of 6 VSEs in Haiti

*Gerançon, 2012*
Communications - 1

• **Articles**
  – Journals (e.g. Software Quality Professional, Crosstalk), IEEE Computer, IEEE Canadian Review, Génie logiciel Magazine, ISO Focus, etc.

• **Book Chapters**
Communications - 2

• Conferences, symposium and workshops
  – Argentina, Brazil, Canada, Colombia, United States, France, India, Italy, Mexico, Peru, Thailand,
  – EuroSPI, PROFES, SPICE, SEI (Pittsburgh, Austin, Guadalajara), INCOSE Symposium (Amsterdam, Rome), INCOSE International Workshops (Arizona, Florida),
  – Project Management Institute (PMI), ITSMF, SPIN, AQIII, INCOSE.

• Wikipedia
Communications - 3

• Translations of ISO/IEC 29110
  • Portuguese (Brazil)
  • Spanish (Peru) *
    • http://bvirtual.indecopi.gob.pe/normas/29110-5-1-2.pdf
  • Japanese
    • Should be published in December 2012
  • French (Canada)
    • http://profs.logti.etsmtl.ca/claporte/English/VSE/index.html

* Spanish Translation Task Force
Videos about ISO/IEC 29110

• On YouTube PlanetISO
  – http://www.youtube.com/user/PlanetISO
  – Video in English
    • http://www.youtube.com/watch?v=viP7WLaFC8E
  – Video in French
    • http://www.youtube.com/watch?v=w8wCIyDqYLI&feature=g-upl
  – Video in Spanish
    • TBC
  – Video in Portuguese
    • TBC
5. Diffusion

An ISO 29110 Public Web Site

- Members of WG
- Introduction
- Survey of VSEs
- Network of Centers
- Generic Profiles
- Deployment Packages
- Pilot Projects
- Education DPs
- Publications

http://profs.logti.etsmtl.ca/claporte/English/VSE/index.html
Technology Transfer Center for VSEs at the ÉTS

• **Mission**
  – To accelerate technology transfer to small and very small structures in Québec developing software products or software-based systems, or to provide IT services to make them more competitive, both at the national level and internationally, by developing and deploying software engineering practices tailored to their needs.

• **Objectives**
  1. Identify, promote, and disseminate best practices in software engineering and services for very small entities;
  2. Accelerate the process of technology transfer in software engineering for VSEs;
  3. Provide information and technical and strategic information to managers of VSEs, outsourcers, and Government of Québec agencies;
  4. Participate in the development of international standards for VSEs;
  5. Promote international standards for VSEs in Québec;
  6. Promote research in software engineering for VSEs;
  7. Promote training and development courses on ISO standards for VSEs.
Description of Pilot Projects

• Template

Une démarche d’amélioration dans un très petit organisme
Étude de cas

Canada - Numéro 001 (Français)   Mai 2010

AMÉLIORATION AU PROCESSUS DE CONTRÔLE DES CHANGEMENTS CHEZ ACME ASSURANCE

Abrégé

Acme Assurance, filiale du Groupe Financier Banque Acme, œuvre dans le secteur des assurances, aussi bien de l’automobile et des motos, des véhicules tout terrain (VTT) et motoneiges, que de l’habitation et de l’assurance médicale voyage. Depuis quelques temps, l’entreprise a décidé de se lancer dans le développement de logiciel en ligne pour faciliter l’interaction avec ses clients et rendre plus disponibles ses services. Le bureau de Montréal compte un département spécial de technologie de l’information appelé Programme de Transformation des Technologies (PTT) qui est chargé de la mise en place de nouvelles méthodologies de travail, de nouveaux processus et de nouveaux produits visant à améliorer la sociabilité de la entreprise et à étendre la gamme d’assurance. Notamment ce projet:
Strategy of Thailand

• Thailand is now using the new software engineering standard ISO 29110 in piloting software procurement related in Thai government agencies.
• There are around 200 government agencies interested in this direction.
• **Within 3 years**, Thailand hope to mandate ISO 29110 as the minimum requirement for all Thai government related for software and system procurement.

Communication from Dr. Anukul Tamprasirt, Nov 29th, 2010
Content

1. Introduction
2. ISO Standards and ISO/IEC JTC1 Sub Committee 7
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4. Tools developed to accelerate the diffusion of ISO/IEC 29110
5. ISO/IEC 29110 Systems Engineering Standards and Guides
6. ISO/IEC 20000 Standard (IT Service Management) in VSEs
7. Next Steps
8. Conclusion
Development of Profiles and DPs in Systems Engineering

Project done under sponsorship of INCOSE/AFIS

- International Council on Systems Engineering (INCOSE)
- Association Française d’ingénierie système (AFIS)

**Goals**

- To improve or make product development efficient by using Systems Engineering methodology
- To elaborate tailored practical guidance to apply to VSEs in the context of prime or subcontractor, of commercial products
- To contribute to standardization
Systems Engineering (SE) for VSEs

• ISO Project approved in September 2011

• Strategy
  • Use ISO 15288 (System Engineering Life Cycle processes) as the reference framework
  • Develop SE profiles to match the ISO 29110 Software profiles
  • Use existing ISO 29110 SW Management and engineering guide to develop the SE Management and engineering guide

• Recent Developments
  • Draft Basic system engineering profile was developed and reviewed
    • Over 470 comments received and analyzed from the first cycle of review (May-September 2012)
  • Draft will be circulated in December 2012 for another cycle of review
    • Comments will be processed at next WG24 meeting in May 2013 in Montréal
Content

1. Introduction
2. ISO Standards and ISO/IEC JTC1 Sub Committee 7
3. Development of ISO/IEC 29110 Standards and Guides for Very Small Entities (VSEs)
4. Tools developed to accelerate the diffusion of ISO/IEC 29110
5. ISO/IEC 29110 Systems Engineering Standards and Guides
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Application of ISO/IEC 20000 to VSEs

• IT Service Management
  – Defines the requirements for a service provider to deliver managed services of an acceptable quality for its customer.

  ![Service Delivery Processes Diagram]

- Capacity Management
- Service Continuity and Availability Management
- Service Level Management
- Service Reporting
- Information Security Management
- Budgeting and Accounting for IT Services
- Configuration Management
- Change Management
- Incident Management
- Problem Management
- Business Relationship Management
- Supplier Management

• Development of Deployment Packages
  – Pilot projects conducted in a Computer support VSE
Application of ISO/IEC 20000 to VSEs

Deployment Packages

Conduite de la démarche vers une certification

Conduite de l’Audit interne

Budgétisation & comptabilisation des services

Mise en place de l’ITSMS

Conception & planification des services

Gestion de la sécurité de l’information

Déploiement & production des services

http://profs.etsmtl.ca/claporte/ISO20000/index.html

(Kabli 2009)
Application of ISO/IEC 20000 to VSEs

• First Pilot project completed in 2009
  – VSE maintaining Apple computers
  – A set of 7 Deployment Packages were developed (in French)

• Supplier of lighting products in Montréal
  – IT service department of 4 employees
  – Over 10,000 components in inventory
  – First Project completed in October 2012
    • Developed and implemented many ISO 20000 processes
  – Second Project started in November 2012
    • Develop and implement 3 processes
      – Information Security Management, Budgeting and accounting, internal audit

• IT Service Department of a College
  – College of about 3,000 students
  – IT Service department of 10 employees
  – Project should be completed by January 2013
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Next Steps

• For Software Engineering
  – Develop/finalize the remaining 2 Profiles
    • Intermediate: Management of more than one project
    • Advanced: Business management and portfolio management practices.
  – Publish Spanish Translations of ISO 29110 documents

• For Systems Engineering
  • Finalize the Basic Profile Management and engineering guide
  • Develop the Basic Profile Specification Standard (i.e. Part 4)
  • Develop a set of Deployment Packages for the Basic Profile
  • Start the development of the Entry Profile
  • Once the Software Intermediate profile is stabilized, start the development of the System Intermediate Profile
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Conclusion

- ISO/IEC 29110 has been specifically designed for VSEs (enterprise, organization, project, department) who develop software,
- ISO/IEC 29110 is intended to help VSEs who have neither the expertise nor the budget nor the time to adapt standards to their needs,
- ISO/IEC 29110 is expected to bring many benefits to VSEs, to their customers and to their business partners,
- ISO/IEC 29110 standards and Guides for VSEs developing systems are under development,
- The concept of profile for VSEs will probably be used in other areas (e.g. ISO 20000 - IT Service Management).
Contact Information

• Claude Y Laporte
  – Voice: + 1 514 396 8956
  – E-Mail: Claude.Y.Laporte@etsmtl.ca
  – Web: http://profs.etsmtl.ca/claporte/English/index.html

• Public site of WG 24
  – Free access to Deployment Packages, presentation material and articles:
    • http://profs.logti.etsmtl.ca/claporte/English/VSE/index.html
References

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