Pittsburgh, PA 15213-3890



The CMMI[®] Product Suite and International Standards

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Agenda

Evolution of Capability Maturity Models® and ISO/IEC 15504

ISO/IEC 15504 Overview and Status

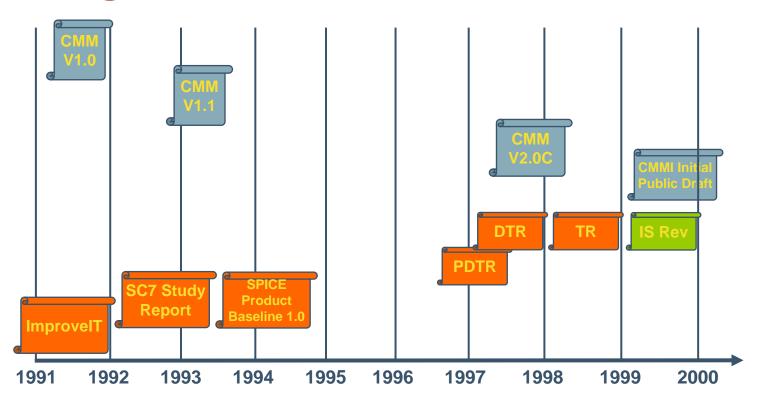
CMMI Synergy with International Standards

Work to be Done

Future Directions

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Progression of CMMs® and 15504 -1

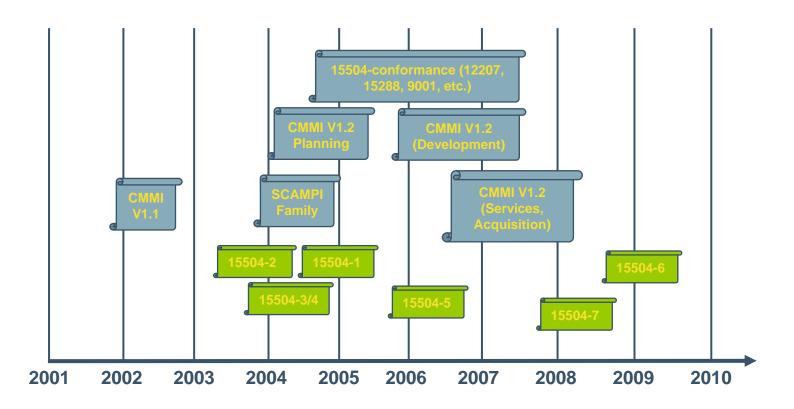


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Progression of CMMs and 15504 -2







What EXACTLY is 15504?

ISO/IEC 15504 is an international standard being progressed by WG10 - a working group established by ISO/IEC/JTC1 SC7.

Prescribes requirements for process assessment; is a framework standard.

Consists of 5 documents (15504-1, ..., 15504-5); note that all parts are now published.

Not the same as ISO/IEC TR 15504 – this is a 9-part set of documents published as ISO Technical Reports in 1998.





Key Premise Underlying 15504

Assessments of process capability will yield results which are comparable as long as:

- the process assessment model satisfies 15504 model compatibility requirements
- the assessment process satisfies 15504 assessment requirements
- the assessment contexts are similar





Evolution of 15504 Specificity

1st generation (pre-Pilanesburg) - practices were HARD-WIRED into 15504 (as a normative component - BPG)

2nd generation (pre-IS) - process definitions were HARD-WIRED into 15504 (as a normative component - 15504-2)

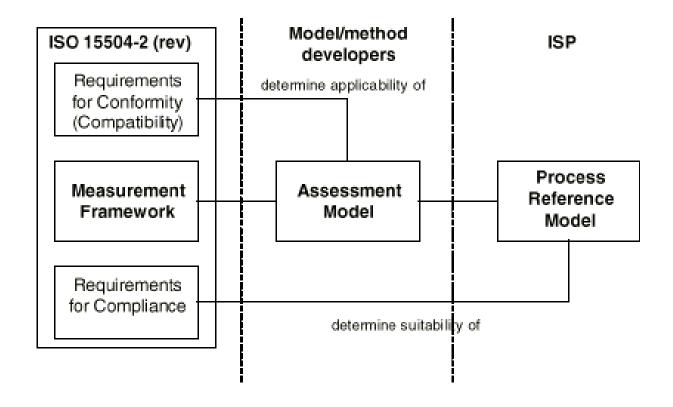
3rd generation (IS) - compliance requirements for Process Reference Models (PRMs) HARD-WIRED into 15504 (as a normative component - 15504-2):

- PRMs will be externally specified
- 12207 includes as an amendment a PRM encompassing TR 15504-2 process definitions (and more)





Architecture for 15504





CMMI and 15504

A-spec requirements relevant to international standards:

- "2.3 Reference Documents
 - 2.3.1 Applicable ISO/IEC documents, including ISO/IEC 12207 and ISO/IEC 15504."

- **"3.1 Development User Requirements**
 - 3.1.6 The CMMI Product Suite shall be consistent and compatible with ISO/IEC 15504."





Synergy With Selected International Standards -1

Identify areas where there are opportunities for synergy between key international standards and the CMMI Product Suite

Exploit these opportunities by developing appropriate work products and/or liaising with appropriate individuals and organizations





Synergy With Selected International Standards -2

Two of the key areas identified to date are the ISO 9000:2000 family of standards and the ISO/IEC 15504 standard

Note that 15504 provides a mechanism for establishing important relationships to other important process-related international standards such as ISO 9001:2000, 12207, 15288





Key Supplements Needed

Identification of suitable process reference models,

Mappings between CMMI model (s) and PRM (s) satisfying 15504 -2 requirements,

Translation mechanism





Translation Mechanism

Purpose: for representing the results of an assessment as a set of process attribute ratings for each process selected from the specified Process Reference Model

How?:

- 1. direct translation of Process Assessment Model ratings into a process profile
- 2. or the conversion of the data collected during the assessment (with the possible inclusion of additional information) through further judgment on the part of the assessor.



Status

A detailed mapping has been developed from CMMI to:

- the Measurement Framework in ISO/IEC 15504; and
- the Process Reference Model included in ISO/IEC 12207.

A possible approach has been developed for verifiable conversion of results.



An Approach for Data Conversion - 1

For the Process Dimension:

- Collect data and generate observations for all Specific Practices in Process Areas within the scope of the assessment.
- Using the mapping tables, assign the data observations to all Process Outcomes and Attributes indicated from the mapping.
 - Thus, if a Specific Practice maps to multiple Process Outcomes, assign the data to all of the possibilities.
- Review the assigned data and remove observations that are not relevant.
- Judge whether the remaining data is adequate to enable judgement of achievement of the outcomes.





An Approach for Data Conversion - 2

Where adequate data is available, consolidate the data to the process level and rate the performance of the process (Process Attribute 1.1).

If the data is not adequate, either:

- Collect additional data; or
- Remove the process from the 15504 scope of the appraisal.





An Approach for Data Conversion - 3

Repeat the exercise for the Generic Practices and Process Attributes 2.1 – 5.2.

Additional data will need to be collected to address gaps in the mapping

Most notably in Process Attribute 3.2

In some cases, evidence from Advanced Practices may also be relevant to a particular Process Attribute for a specific Process or set of Processes.





Tool Support

To achieve this form of conversion is complex and difficult, without tool support.

A tool (the Appraisal Assistant) has been developed for managing evidence and ratings in CMMI appraisals, with a specific focus on conversion of data to generate ISO15504 Process Profiles.

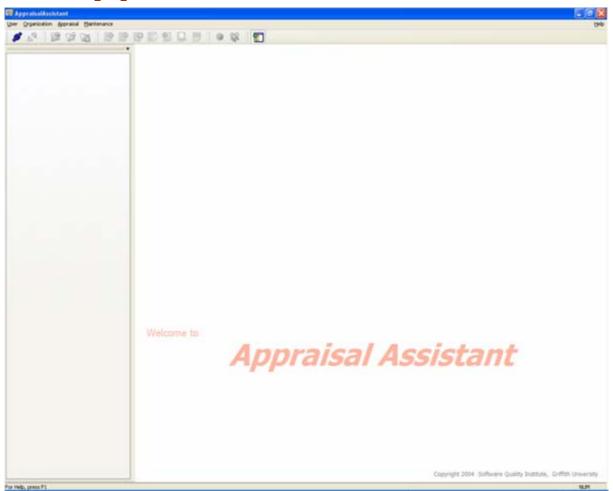
The tool automatically generates lists of data for a Process Attribute based upon detailed ratings tables.

- It permits de-selection of data judged to be not relevant.
- It highlights areas where there may be a lack of relevant evidence.





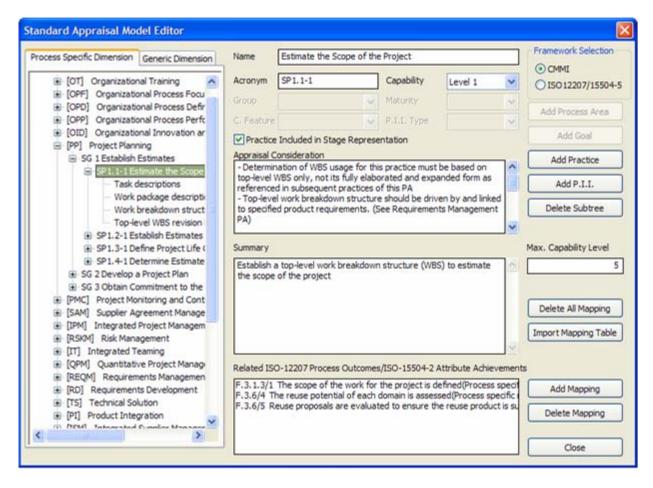
The Appraisal Assistant







Model Details





Pilot Appraisal

15504-conformant SCAMPI A appraisal conducted at Critical Software, SA during February-March 2006

- Maturity level 3 scope
- Process reference model embedded in ISO/IEC 12207 (amended)
- Mapping between CMMI and 12207 provided by Software Quality Institute
- Appraisal team included 3 SCAMPI Lead appraisers, one ISO 9001 auditor and one SPICE assessor
- Support automation provided by Software Quality Institute Appraisal Assistant
- Subset of 15504 process profiles generated as well as selected ISO 9001 outcomes.





Project Management Process

Maps to elements from the following Process Areas:

- Project Planning
- Project Monitoring and Control
- Supplier Agreement Management
- Requirements Management
- Integrated Project Management
- Quantitative Project Management

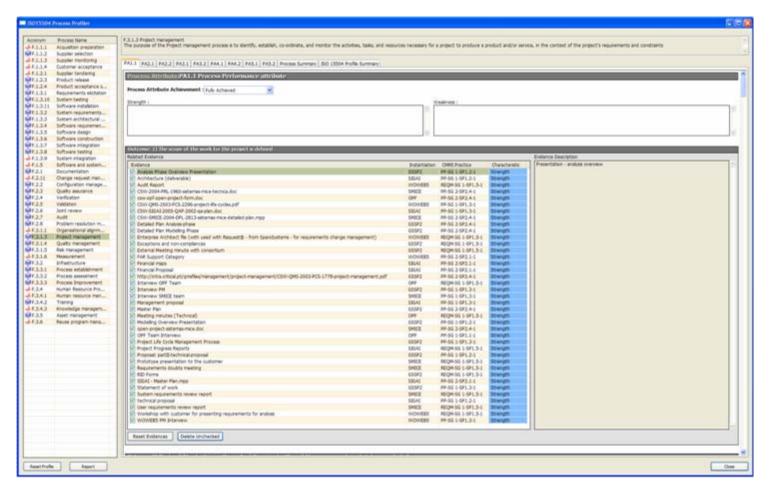
With minor linkages to

- Organizational Process Performance
- Risk Management
- Verification





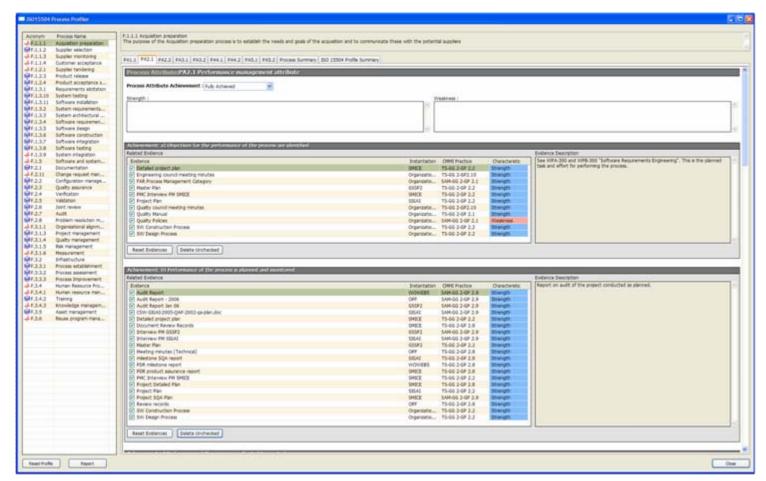
Project Management Process





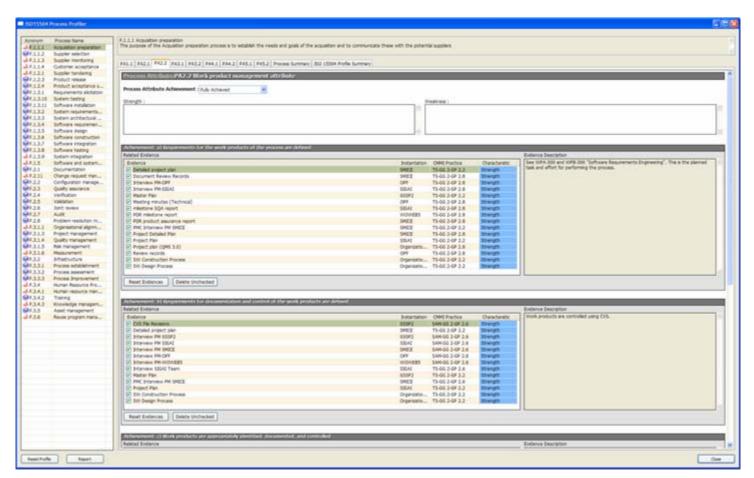


PA 2.1 – Process Management





PA 2.2 – Work Product Management

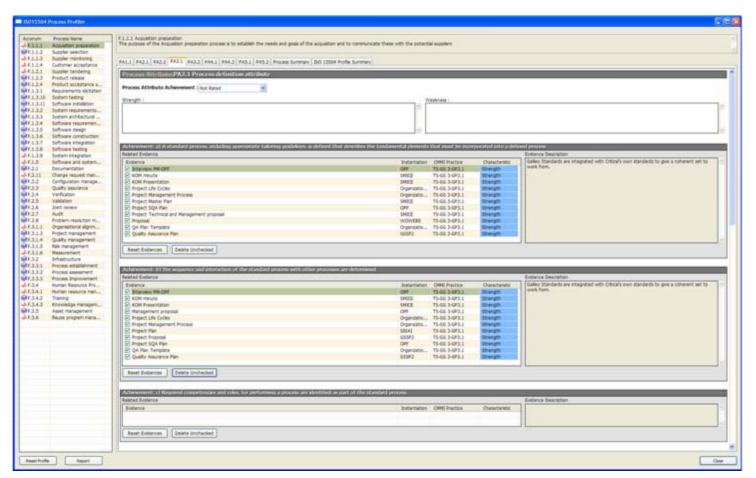


СМИ





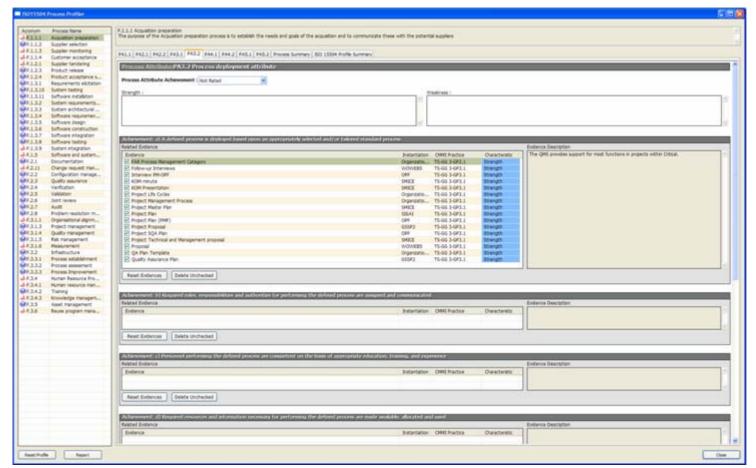
PA 3.1 – Process Definition







PA 3.2 – Process Deployment







Pilot Appraisal Report

Result considered a successful demonstration of ability to fulfill 15504 requirements and generate 15504 process profile relative to a separate process reference model,

Demonstrated criticality of adequate supporting automation





Pilot Observations

Improvement opportunities were identified for support automation

Sample of 12207 processes were rated and a sample of 9001 clauses were examined

Observed consistency between CMMI findings and prior 9001 audit reports as well as prior SPICE assessments, given the expected progress of the improvement program at Critical.





Issues from the Pilot Appraisal

Model-related:

 Deficiencies previously identified in the relationship between CMMI Generic Practices and the 15504 Measurement Framework had a significant impact on assessment of Level 3 Process Attributes.

Technology-related:

- Significant issues in usability of the "translation" functions.
- Need to incorporate the ability to capture additional evidence where needed.





Further effort

Additional pilot appraisals are required to identify any additional issues and to raise confidence in the translation mechanism as well as the translation requirements of 15504.

Ideally a combined CMMI / SPICE assessment using two independent teams should be undertaken.

The ability to perform "bi-directional" translation would be useful (i.e. determine CMMI capabilities from a SPICE assessment) would be useful.





Beta-2 Release

Significant improvements to the Evidence Registry and to Ratings Generation.

CMMI – ISO 15504 mapping functions improved in line with findings from the Pilot Appraisal.

Available for download from http://www.sqi.gu.edu.au/AppraisalAssistant

The SQI is committed to two further beta releases of the Appraisal Assistant in 2007.





Beta Test Programme

Initial release 2005

Beta 2 release 28 July 2006

503 registered beta testers

217 downloads of Beta 2 version





More Information

The Appraisal Assistant:

http://www.sqi.gu.edu.au/AppraisalAssistant

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