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**Método SCAMPI para Avaliação CMMI®  
(Capability Maturity Model Integration)  
e CBA-IPI para SW-CMM**

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## Avaliação de Processo

An examination of one or more processes by a trained team of professionals using an appraisal reference model as the basis for determining, as a minimum, strengths and weaknesses. [ARC v1.1]

**Contexto:**

**Melhoria Contínua:** avaliação identifica oportunidades de melhoria

**Determinação da Capacidade:** avaliação identifica riscos com o fornecedor

## Terminologia SW-CMM e CMMI

Requisitos para Métodos de Avaliação:

CMM: CAF (CMM Appraisal Framework)

CMMI:ARC (Assessment Requirements for CMMI)

Métodos de Avaliação:

CMM: Capability Maturity Model® (CMM®)-Based Appraisal for Internal Process Improvement (CBA-IPI), e

Software Capability Evaluation (SCE)

CMMI:SCAMPI (Standard CMMI Assessment Method for Process Improvement)

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## Classes de Metodos de Avaliação

### (ARC: *Assessment Requirements for CMMI*)

Característica	Classe A	Classe B	Classe C
Quantidade de evidências objetivas	Alto	Médio	Baixo
Geração de pontuação	Sim	Não	Não
Recursos necessários	Alto	Médio	Baixo
Tamanho da equipe	Grande	Médio	Pequeno
Requisito para o líder da equipe de avaliação	<i>Lead Appraiser (LA)</i>	LA ou pessoa treinada e experiente	Pessoa treinada e experiente

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## Exemplo: SCAMPI<sup>SM</sup>

### **Standard CMMI<sup>SM</sup> Appraisal Method for Process Improvement (SCAMPI<sup>SM</sup>)**

- Método de avaliação de processo para os modelos CMMI
- Método Classe A (ARC), também para ISO/IEC 15504
- Fases:
  - planeja e prepara a avaliação
  - conduz a avaliação
  - reporta os resultados
- Referência: CMU/SEI-2001-HB-001 **Standard CMMI<sup>SM</sup> Appraisal Method for Process Improvement (SCAMPI<sup>SM</sup>), Version 1.1: Method Definition Document**

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## Formação de Lead Assessor

- Curso Introduction to CMMI
- Membro da Equipe de Avaliação em duas avaliações
- Curso Intermediário sobre CMMI
- Curso/Workshop Lead Assessor
- Lead Assessor de uma avaliação supervisionada
- Filiação a um SEI Transient Partner

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**Nota:** Os slides a seguir foram selecionados dos apresentados no Silicon Valley SPIN (Califórnia, EUA) em 29/05/2002 por Diane McDonald.

## Capability Maturity Model® (CMM®) Integration<sup>SM</sup> Appraisals Methods - What's New?

Presented to the  
Silicon Valley SPIN -5/29/02  
**Diane McDonald**



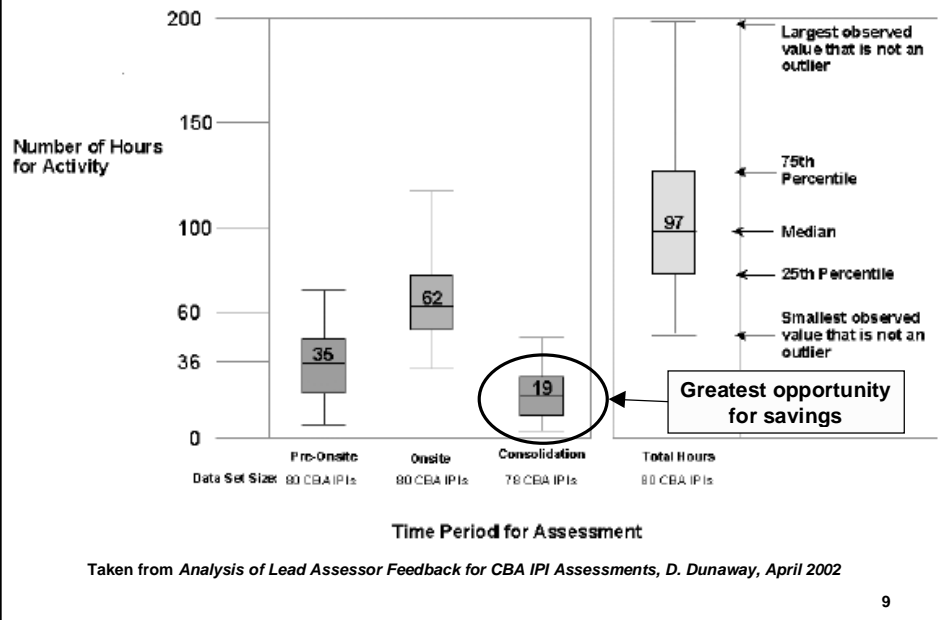
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## SCAMPI Objectives

- Gain insight into an organization's engineering capability by identifying the strengths and weaknesses of its current processes
  - Relate these strengths and weaknesses to the CMMI model
- Prioritize improvement plans
  - Focus on improvements (correct weaknesses that generate risks) that are most beneficial to the organization given its current level of organizational maturity or process capabilities
- Derive capability level ratings, as well as a maturity level rating
- Identify development/acquisition risks relative to capability/maturity determinations

## Lessons Learned from CBA IPIs



## Verification vs. Discovery

- Shift appraisal team focus from discovery to verification
  - Leverage pre-on-site analysis of organization model implementation, e.g.,
    - Documentation (policies, process descriptions, project plans)
    - Mapping and traceability tables (processes to the CMMI)
    - Verification and oversight activities (e.g., internal appraisals, QA audits, status reports)
    - Tools and resources (e.g., databases, measurement repositories, configuration management tools)
- Mappings generated and reviewed prior to the on-site period
  - Readiness review conducted to:
    - Determine readiness to proceed
    - Re-evaluate the time required for the on-site period

## Objective Evidence Sources

- Instruments
  - Organizational assets reflecting evidence of implementation of CMMI practices (e.g., mapping tables)
  - questionnaires, surveys
- Presentations
  - Overview briefings, tool demonstrations
- Documents
  - Organizational policies, procedures, and implementation-level artifacts
  - Hardcopy, softcopy, hyperlinks
- Interviews
  - Structured interviews, on-call interviews, follow-up interviews
  - Project leaders, managers, practitioners, users

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## Practice Implementation Indicators

- Practice implementation indicators (PIIs) - the “footprints” that are the necessary or incidental consequence of practice implementation
  - Include artifacts as well as information gathered from interviews with managers and practitioners
- PII-based process appraisal uses PIIs as the focus for verification of practice implementation
  - This is in contrast to an observation-based approach (CBA IPI) that relies on the crafting of observations that pertain to model implementation strengths or weaknesses

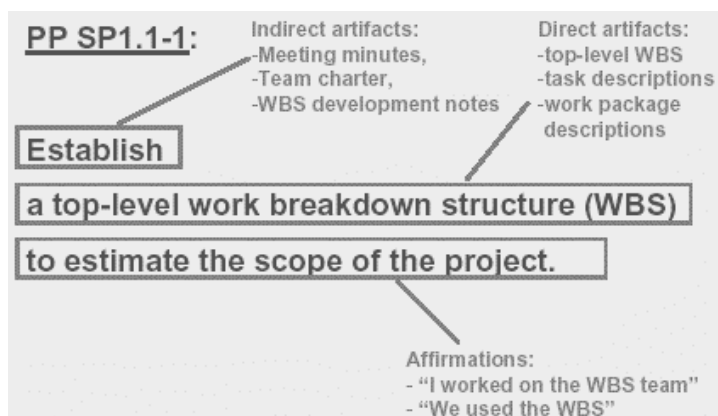
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## Practice Implementation Indicator Types

- Direct Artifacts
  - Tangible outputs resulting directly from implementation of a practice; CMMI's "typical work products"
    - e.g., project plan, project performance measures
- Indirect Artifacts
  - Artifacts that are a side-effect or indicative of performing a practice
    - e.g., meeting minutes, reviews, logs, reports
- Affirmations
  - Oral or written statements confirming or supporting implementation of the practice
    - e.g., interviews, questionnaires

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## Example of PII Use



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## Rules for Characterizing Practice Implementation - Instantiation Level

Label	Meaning
<b>Fully Implemented (FI)</b>	<b>Direct artifacts present &amp; appropriate</b> <ul style="list-style-type: none"> <li>• Supported by indirect artifact &amp;/or affirmation</li> <li>• No weaknesses noted</li> </ul>
<b>Largely Implemented (LI)</b>	<ul style="list-style-type: none"> <li>• Direct artifacts present &amp; appropriate</li> <li>• Supported by indirect artifact &amp;/or affirmation</li> <li>• One or more weaknesses noted</li> </ul>
<b>Partially Implemented (PI)</b>	<b>Direct artifacts absent or judged inadequate</b> <ul style="list-style-type: none"> <li>• Artifacts or affirmations indicate some aspects of the practice are implemented</li> <li>• One or more weaknesses noted</li> </ul>
<b>Not implemented (NI)</b>	Any situation not covered by above

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## Process Area & Capability Profile Ratings

- Process Area (PA) ratings (CMMI staged representation) are based on goal satisfaction
  - A PA is rated Unsatisfied, if any goal is rated as Unsatisfied
- Capability Profile (CMMI continuous representation)
  - The capability level for each PA is based upon the highest level and all levels below for which its specific goals (within the appraisal scope) are Satisfied
  - A capability level (CL) rating (0-5) is assigned to each PA

PA and Capability Profile ratings are optional

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## Data Collection & Rating Concepts

- Corroboration
  - Must have direct artifacts for each practice and for each instance, combined with either indirect artifact or affirmation
- Coverage
  - Must have sufficient objective evidence for implementation of each practice, for each instance
  - Must have face-to-face affirmations (to avoid “paper-only appraisals”)

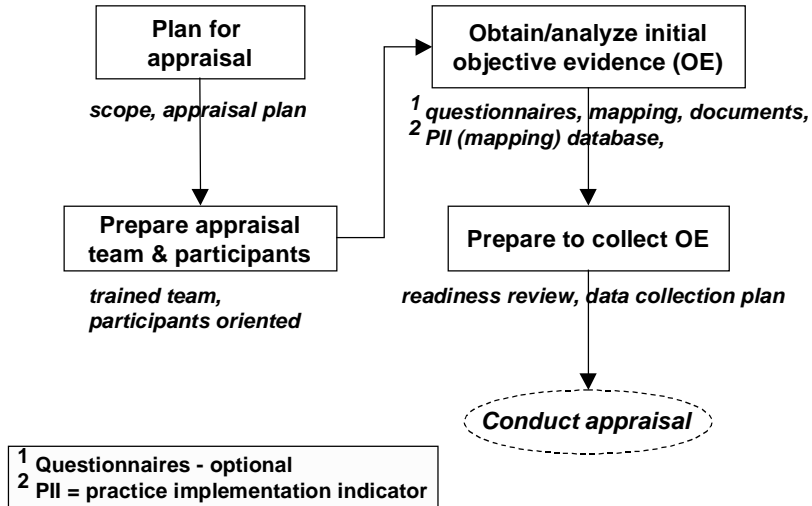
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## Generating Findings

- Weaknesses - findings at the OU level that summarize gaps in practice implementation
  - Typically at the goal level
  - No attribution to individual projects
- Strengths - have a different connotation (“above and beyond”) than a CBA IPI
  - Are not recorded if the practices are Fully Implemented

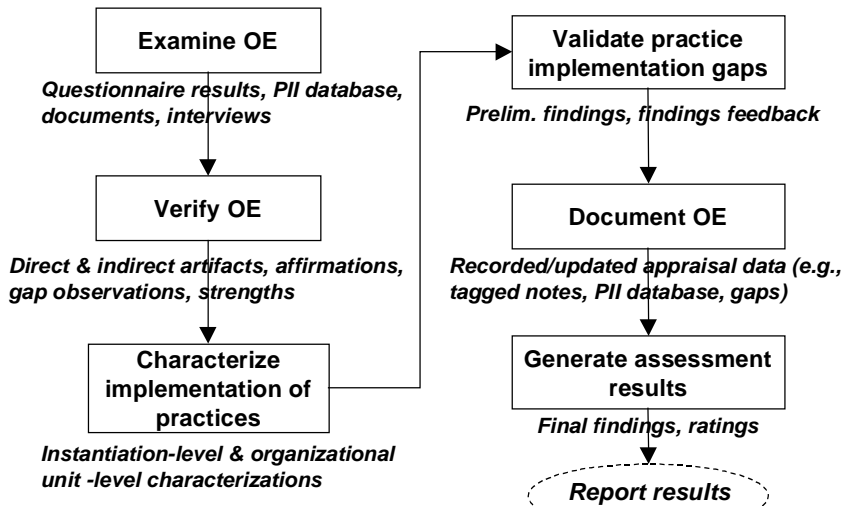
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## SCAMPI Process Flow - Plan & Prepare



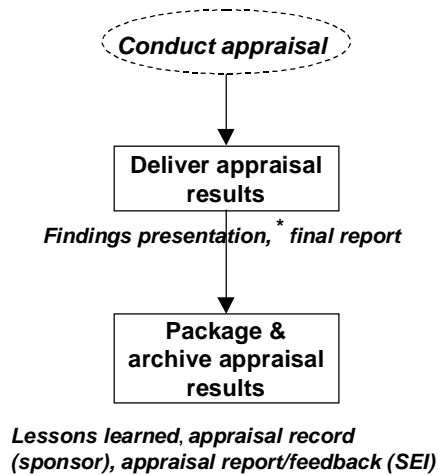
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## SCAMPI Process Flow - Conduct



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## SCAMPI Process Flow - Report Results



\* Final report is optional

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## SW-CMM to CMMI Transitioning

- Determine your business objectives for using the CMMI and conducting a SCAMPI
- Learn the CMMI
- Review transition material (available thru the SEI's website)
  - e.g., *The Road to CMMI: Results of the First Technology Transition Workshop*, SEI, Feb. 2002
- Generate mapping table (organizational/project processes to the CMMI)
  - Reference CMM to CMMI model mapping, available thru the Software Technology Support Center, <http://www.stsc.hill.af.mil/cmmi/>
- Determine what appraisal method class is appropriate (A, B, or C)
- SW-CMM sunsetting
  - SEI public training of CMM ceases on Dec. 2003, however Transition Partners may still provide training
  - SCAMPI replaces CBA IPIs and Software Capability Evaluations (SCEs)
    - No more updates to CBA IPI and SCE methods
    - CBA IPI Lead Appraisers and SCE Lead Evaluators trained thru Dec. 2003
    - SCAMPI, the single appraisal method of choice after Dec. 2003

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