**Carnegie Mellon**
**Software Engineering Institute**

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# SCAMPI B&C Tutorial

## Software Engineering Process Group Conference

### SEPG 2004

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# Outline
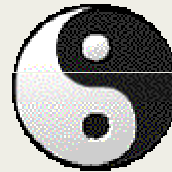
## Overview

Differentiating SCAMPI Family Members

Implementation Details

Operational Scenarios

Program Overview and Project Status

# Motivation for Appraisal

Technical Analysis
- Evaluating detailed practices
- Rigorous data collection
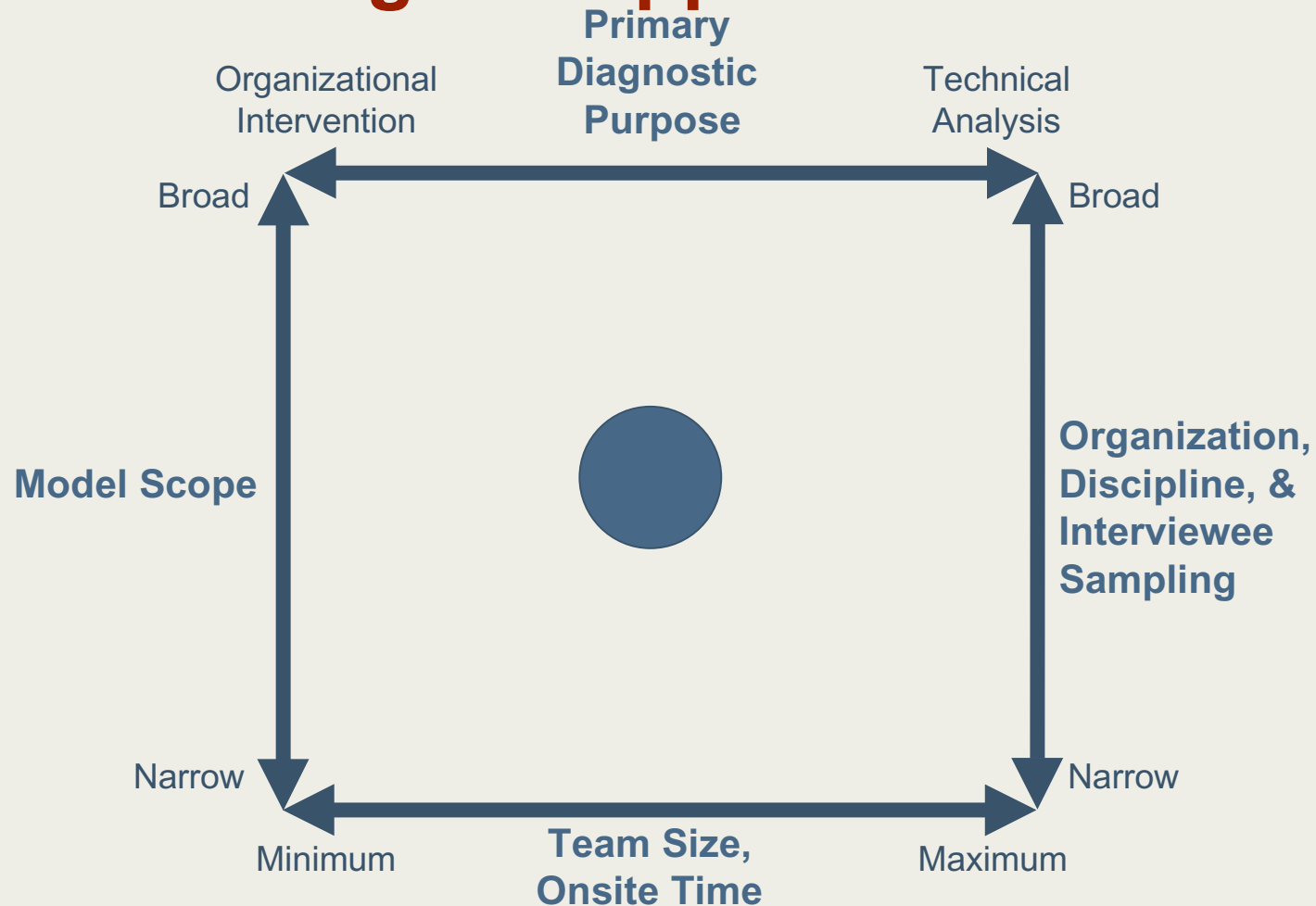- Carefully defined scope
- Potential external visibility

Organizational Intervention
- Assessing culture for change
- Building local championship
- Preparing for improvement
- Finding the stimulus for change

# Tailoring the Appraisal Process

**Primary Diagnostic Purpose**

Organizational Intervention

Technical Analysis

Broad

Broad

**Model Scope**

**Organization, Discipline, & Interviewee Sampling**

Narrow

Narrow

Minimum

Maximum

**Team Size, Onsite Time**

# Appraisal Use/Purpose: Examples

Formulating Our
Winning Strategy

Fixing Immediate
Problems

Exploring Goals for
Improvement &
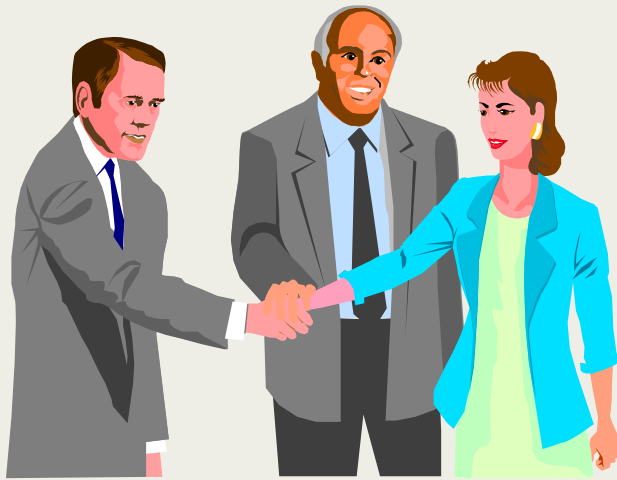Training Staff

# Appraisal Outcomes: Examples -1

Making Sure Our
House is in Order

Charting Progress
Against Our Plan

# Appraisal Outcomes: Examples -2

Recognize Progress
and Celebrate Success

Find New
Challenges
to Conquer

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# Differentiating SCAMPI B&C vs. ARC B&C

SCAMPI B&C methods differ from ARC Class B&C
- Defined based on focus of application
- Membership in a family of integrated methods
- Shared definitions of inputs, data structure and outputs
- Upward compatibility where desired
- Range of defined tailoring to fit differing situations

Not all possible tailoring options in ARC class B & ARC class C methods will be included in the set of allowable tailoring options in SCAMPI B & SCAMPI C

# Distinguishing Characteristics

The primary distinction between the three members of the SCAMPI family lies in the focus of their application

• SCAMPI C is focused on appraising "Approach"

• SCAMPI B is focused on appraising "Deployment"

• SCAMPI A is focused on appraising "Institutionalization"

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# Approach
## SCAMPI C

# Deployment
## SCAMPI B

# Institutionalization
## SCAMPI A

# Non-Linear Differences in Tailorability

*breadth & depth of tailoring*

**SCAMPI C**, with a primary focus on approach, can take on a very wide range of forms – including some examination of deployment.

**SCAMPI B**, with a primary focus on deployment, is somewhat more constrained by corroboration requirements from the ARC.

**SCAMPI A**, the most rigorous method, is intended to be implemented within a narrowly defined set of standards.

C

B

A

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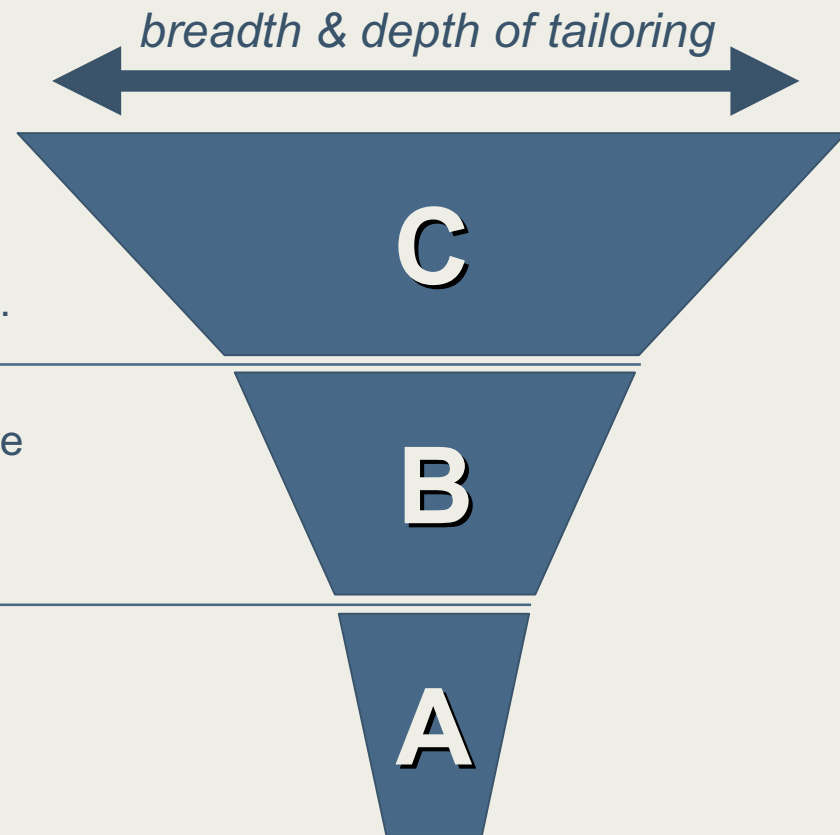
# SCAMPI C – Focus on "Approach"

Appraise practices without looking at implementation
- Discuss implementation without looking at it
- More cursory examination of what people do
- Plan for future implementation

Adequacy of concept is the focus
- Examine fidelity to practices in the CMMI
- Brainstorm possible implementations
- Anticipate ROI in context

Sufficient coverage is practically irrelevant
- Seek pockets of best practice in the organization
- Focus on most compelling model content

# SCAMPI C – Examples of Usage

Organizations' first look at CMMI, or a part of the model

Rapid appraisal to gather data without using interviews

Capturing a thumbnail sketch of a contractor's process

Review of a new baseline process before deployment

Planning to fill a gap identified in a previous appraisal

Brainstorming how to transition from another model

# SCAMPI B – Focus on "Deployment"

Examine how selected approaches fit in context
- Understand variation in actual practice
- Capture business drivers that lead to tailoring
- Identify needed course-correction

Understanding diversity of implementation is the focus
- Involve technical staff in dialogue about what "works"
- Examine direct artifacts resulting from implementation
- Seek input to update the approach

Focus coverage criteria with business drivers
- Validate the most beneficial model elements
- Brainstorm remaining model elements

# SCAMPI B – Examples of Usage

Gathering best practices to define an OSSP

Checking the status of deployment to new projects

Preparing for a benchmarking appraisal

Mini-appraisal to sustain momentum and buy-in

Incremental appraisals monitoring enterprise deployment

# SCAMPI A – Focus on "Institutionalization"

Understand the impact of deploying the approach
- Characterize the 'pervasiveness' of practices
- Rate goal satisfaction
- Capture business value achieved so far

Institutionalization of 'goal-satisfying' practices is the focus
- Understand barriers to deployment
- Seek performance enhancements
- Communicate enablers for improvement

Sufficient coverage with highly reliable data
- Organizational coverage avoids missed opportunities
- Model scope that provides a meaningful milestone

# SCAMPI A – Examples of Usage

Benchmarking to document achievement

Rigorous basis for findings to support risk assessment

Documented and defensible scope of generalizability
 • intended to support 'reuse' over a limited time-frame

Usage expected to become more narrow:
•SCAMPI B to cover notable % of current enactments
•Enforcement of rigorous standards is increasing
•Cost expected to decrease with history of B&C use

# Comparing SCAMPI B&C with A

*Handbook for Implementing SCAMPI B&C* is in draft

Names of processes documented for SCAMPI A are used

*Method Definition Document* for SCAMPI A contains
- Phases: Processes: Activities

The *Handbook* currently contains
- Phases: Processes

The following slides reference the MDD for SCAMPI A
- Much of the intent in A applies to B&C
- Many of the activities apply at a higher level

# Appraisal Input and Appraisal Plan

| MDD Part II: Process Definitions | SCAMPI B | SCAMPI C |
|---|---|---|
| **1.1. Analyze Requirements** | | |
| 1.1.1. Determine Appraisal Objectives | Applies | Applies |
| 1.1.2. Determine Appraisal Constraints | Applies | Applies |
| 1.1.3. Determine Appraisal Scope | Applies | Applies |
| 1.1.4. Determine Outputs | Applies | Applies |
| 1.1.5. Obtain Commitment to Appraisal Input | Applies | Applies |
| **1.2. Develop Appraisal Plan** | | |
| 1.2.1. Tailor Method | Applies | Applies |
| 1.2.2. Identify Needed Resources | Applies | Applies |
| 1.2.3. Determine Cost and Schedule | Applies | Applies |
| 1.2.4. Plan and Manage Logistics | Applies | Applies |
| 1.2.5. Document and Manage Risks | Applies | Applies |
| 1.2.6. Obtain Commitment to Appraisal Plan | Applies | Applies |

# Team Composition & Objective Evidence

| MDD Part II: Process Definitions | SCAMPI B | SCAMPI C |
|---|---|---|
| **1.3.Select and Prepare Team** | | |
| 1.3.1.Identify Team Leader | Applies | Applies |
| 1.3.2.Select Team Members | Applies | Optional |
| 1.3.3.Prepare Team | Applies | Optional |
| **1.4.Obtain and Analyze Initial Objective Evidence** | | |
| 1.4.1.Prepare Participants | Applies | Applies |
| 1.4.2.Administer Instruments | Optional | Optional |
| 1.4.3.Obtain Initial Objective Evidence | Optional | Optional |
| 1.4.4.Inventory Objective Evidence | Applies | Optional |
| **1.5.Prepare for Collection of Objective Evidence** | | |
| 1.5.1.Perform Readiness Review | Applies | Applies |
| 1.5.2.Prepare Data Collection Plan | Applies | Applies |
| 1.5.3.Replan Data Collection | Optional | Optional |

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# Examining and Processing Evidence

| MDD Part II: Process Definitions | SCAMPI B | SCAMPI C |
|---|---|---|
| **2.1.Examine Objective Evidence** | | |
| 2.1.1.Examine Objective Evidence from Instruments | Optional | Optional |
| 2.1.2.Examine Objective Evidence from Presentations | Optional | Optional |
| 2.1.3.Examine Objective Evidence from Documents | Applies | Optional |
| 2.1.4.Examine Objective Evidence from Interviews | Applies | Optional |
| **2.2.Verify and Validate Objective Evidence** | | |
| 2.2.1.Verify Objective Evidence | Applies | Applies |
| 2.2.2.Characterize Implementation of Model Practices | Applies | Applies |
| 2.2.3.Validate Practice Implementation Gaps | Applies | Optional |

# Documenting Data and Results

| MDD Part II: Process Definitions | SCAMPI B | SCAMPI C |
|---|---|---|
| **2.3. Document Objective Evidence** | | |
| 2.3.1. Take/Review/Tag Notes | Applies | Optional |
| 2.3.2. Record Presence/Absence of Objective Evidence | Applies | Applies |
| 2.3.3. Document Practice Implementation Gaps | Applies | Optional |
| 2.3.4. Review and Update the Data Collection Plan | Applies | Optional |
| **2.4. Generate Appraisal Results** | | |
| 2.4.1. Derive Findings and Rate Goals | N/A | N/A |
| 2.4.2a. Determine Process Area Capability Level | N/A | N/A |
| 2.4.2b. Determine Satisfaction of Process Areas | N/A | N/A |
| 2.4.3a. Determine Capability Profile | N/A | N/A |
| 2.4.3b. Determine Maturity Level | N/A | N/A |
| 2.4.4. Document Appraisal Results | Applies | Applies |

# Delivering and Packaging Outputs

| MDD Part II: Process Definitions | SCAMPI B | SCAMPI C |
|---|---|---|
| **3.1.Deliver Appraisal Results** | | |
| 3.1.1.Present Final Findings | Applies | Applies |
| 3.1.2.Conduct Executive Session(s) | Optional | Optional |
| 3.1.3.Plan for Next Steps | Applies | Applies |
| **3.2.Package and Archive Appraisal Assets** | | |
| 3.2.1.Collect Lessons Learned | Applies | Applies |
| 3.2.2.Generate Appraisal Record | Applies | Applies |
| 3.2.3.Provide Appraisal Feedback to CMMI Steward | Applies | Applies |
| 3.2.4.Archive and/or Dispose of Key Artifacts | Applies | Applies |

# Detailed Content

For each process, the *Handbook* contains:
- Required Practices
- Parameters and Limits
- Guidance

  *Because the SCAMPI B&C methods are intended to be less rigorous and more flexible, it is not expected that every activity required in SCAMPI A would have an analogous requirement in SCAMPI B and SCAMPI C*

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# Approach, Deployment & Institutionalization

SCAMPI C can limit the investigation to "approach"
- Examining the *intended* process

SCAMPI B can limit the investigation to "deployment"
- Examining the *implemented* process

SCAMPI A can focus on how implementation meets intent
- Examining the *institutionalization* of implemented practices, based on the organization's intended practices

# Practice Characterization

SCAMPI C : Fidelity

- Characterize the extent to which the approach is judged to be consistent with the intent of the CMMI

SCAMPI B : Risk

- Characterize the extent to which the enacted practice reflects the intent of the CMMI, without regard to institutionalization and limitations in sampling

SCAMPI A : Implementation

- Characterize the extent to which the planned and enacted practice, in a sufficient sample of an organization, are institutionalized in a way to support satisfaction of the relevant goal within the CMMI.

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# Characterizing Fidelity – SCAMPI C

The appraiser, or appraisal team will characterize the extent to which the approach (planned or deployed) is judged to be consistent with the intent of the CMMI.

**Hi Fidelity**: The intent of the model practice is judged to be adequately addressed in the set of practices (planned or deployed) – in a manner that supports achievement of the goal in the given process context.

**Medium Fidelity**: The intent of the model practice is judged to be partially addressed in the approach – and only limited support for goal achievement is evident.

**Lo Fidelity**: The intent of the model practice is judged absent, or inadequately addressed in the approach – goal achievement is judged unlikely because of this absence or inadequacy

# Characterizing Risk – SCAMPI B

The appraisal team will characterize the extent to which the set of enacted practices reflects the intent of the CMMI, without regard to breadth and depth of deployment.

**Lo Risk**: The intent of the model practice is judged to be adequately addressed in the implemented set of practices examined – in a manner that would support goal achievement, if the practice were deployed across the organizational unit.

**Medium Risk**: The intent of the model practice is judged to be partially addressed in the set of implemented practices – some gaps or issues were identified, which might threaten goal achievement if the deployment occurred in this way across the organizational unit.

**Hi Risk**: The intent of the model practice is judged to be absent or poorly addressed in the set of implemented practices – gaps or issues that will prevent goal achievement, if the deployment occurred in this way across the organizational unit, were identified.

# Practice Implementation Indicators

Practice Implementation Indicators are a hallmark of the SCAMPI family of appraisals

There are three uses for PIIs
- Organize and categorize input data
- Structure used by the team to inventory and analyze data during the conduct of the appraisal
- Basis for summarizing validated Objective Evidence as a result of the appraisal conduct

# Required Outputs: SCAMPI B&C

Appraisal input

Appraisal plan, annotated with actual data for

- time, effort and cost
- model coverage
- organizational coverage

Appraisal record

Appraisal Disclosure Statement (ADS)

*Official*

*J. Hancock*

# Expected Outputs: SCAMPI B&C

Statements of strengths and/or weaknesses relative to model practices, goals or other components.

Characterizations of model practices that identify differences across

- model components covered in the appraisal
- organizational units included in the appraisal



**Your Results**

- Findings statements
- Strengths/Weaknesses
- Recommendations
- ...

# Optional Outputs: SCAMPI B&C

Detailed data summaries
related to a pre-existing:
- process improvement target
- performance contract
- remedial improvement action
- set of risk areas in a contract

Orientation and/or training for:
- improvement champions
- technical and managerial staff
- sponsors new to CMMI

A 'watershed' event for a group
of co-workers.
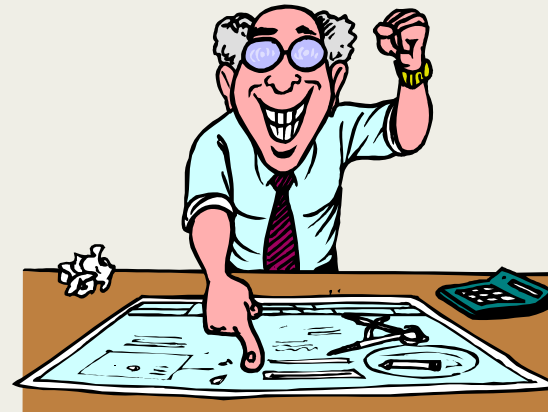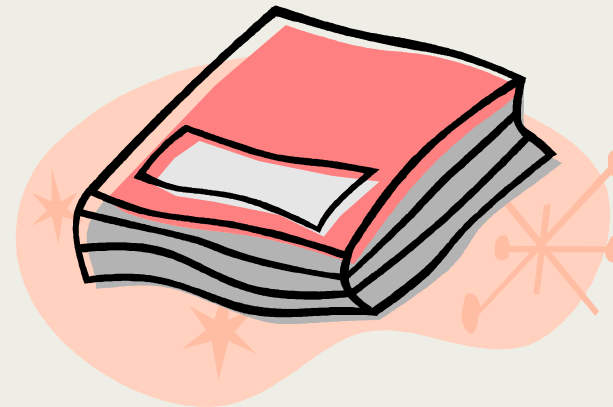
# Appraisal Reporting Techniques

Formal presentations using "slides" - words and graphics.

Facilitated, interactive, presentations with specific participants.

Group or individual meetings involving appraisers and participants.

Written material, ranging from 'bulleted' summaries in presentation slide format to a full detailed report.

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# Using Upwardly-Compatible SCAMPIs

Integrated Suite of Appraisal Methods
- outputs upwardly compatible, feeding the next event
- conduct of B&C reduces effort of the subsequent A
- tracking progress over time with consistent baselines
- model interpretations resolved in low-pressure setting
- PIIDs evolve with deeper understanding

# "Stand-Alone" Usage of Methods

Not every appraisal is an element of a particular sequence
- organizations have process monitoring strategies
- acquisition contexts may afford fewer interactions
- if you don't care about levels, you <u>may never do an A</u>
- transition from SW-CMM to CMMI isn't starting over
- quality assurance groups might use mini-appraisals
- many custom applications supported by the methods
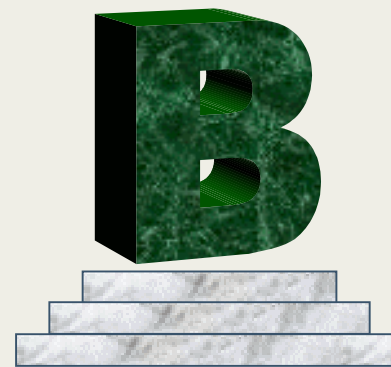
# Appraisal Archetypes

The following 7 typical appraisal types are being used to identify a range of appraisal applications.

The new SCAMPI B and SCAMPI C methods will accommodate a wide range of appraisal types, through defined tailoring options.

The Archetypes provide insight about the priorities that match sets of tailoring options.

# Getting-Started Intervention

Purpose: An organizational intervention to educate and motivate people to initiate a CMMI-based process improvement program.



Description: Expert-directed method with emphasis on the participation of affected groups in facilitated sessions - with no focus on sufficiency of coverage. The emphasis is on the organization's priorities, not those of the model.

# Mini Appraisal

**Purpose:** An abbreviated version of a benchmarking appraisal used to provide data and experience. The purpose is often a dress-rehearsal for the benchmarking appraisal. Generating PIIDs as well as strengths and weaknesses is the typical motivation. Data generated will support action planning.

**Description:** Team-based, data intensive method that emphasizes the use of Objective Evidence - with reduced focus on data sufficiency.
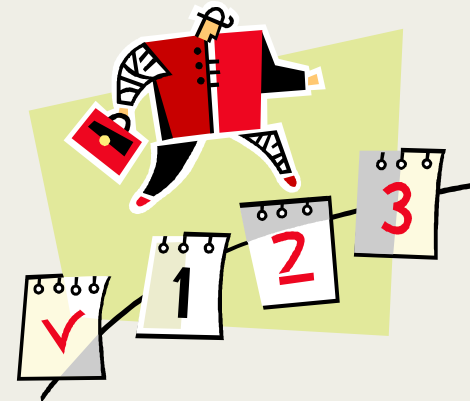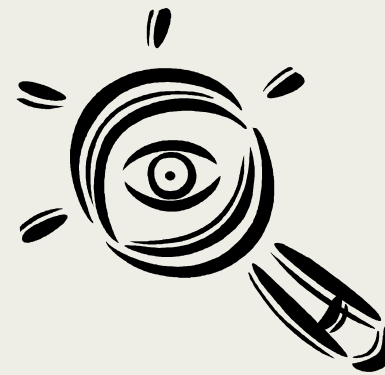
# Gap Analysis

Purpose: Examine a narrowly defined scope (of the model or the organization) for the purpose of identifying the high-priority issues to be resolved in order to reach a desired state.

Description: Expert-based, data-intensive method with emphasis on identification of weaknesses - and a strong focus on sufficiency of coverage.

# Improvement Monitoring

**Purpose:** Track implementation of process improvement actions in an organizational unit that has previously undergone an appraisal.

**Description:** Highly tailored method that emphasizes identifying status of changes in processes - with more limited focus on sufficiency of coverage. The focus of the appraisal is driven by the on-going improvement program, and the plan that drives it.
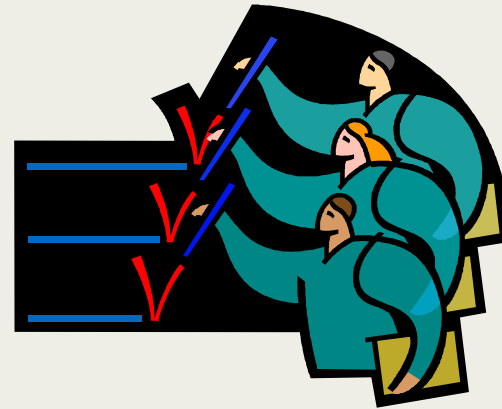
# Delta Appraisal

Purpose: Confirm corrective actions resulting from a previous appraisal.

Description: A method that emphasizes confirming specific changes in processes. These changes prevented attainment of some baseline on a previous appraisal. This appraisal must assure that the other parts of the baseline have not 'eroded' and that the changes made integrate with the rest of the baseline.
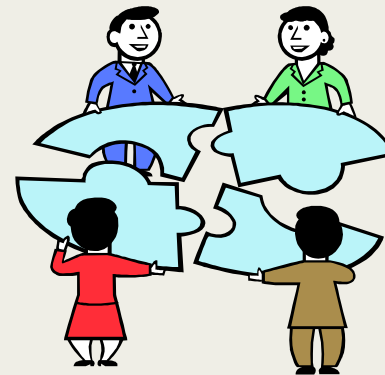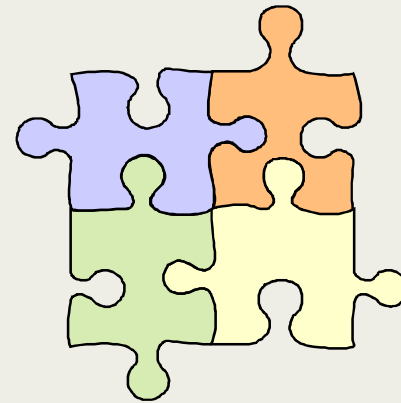
# Incremental Appraisal

Purpose: Building a profile of results across a broad model and/or organizational scope – over time.

Description: Expert-directed or team-based, data intensive method that emphasizes use of objective evidence - with strong focus on sufficiency of coverage (in narrow increments).
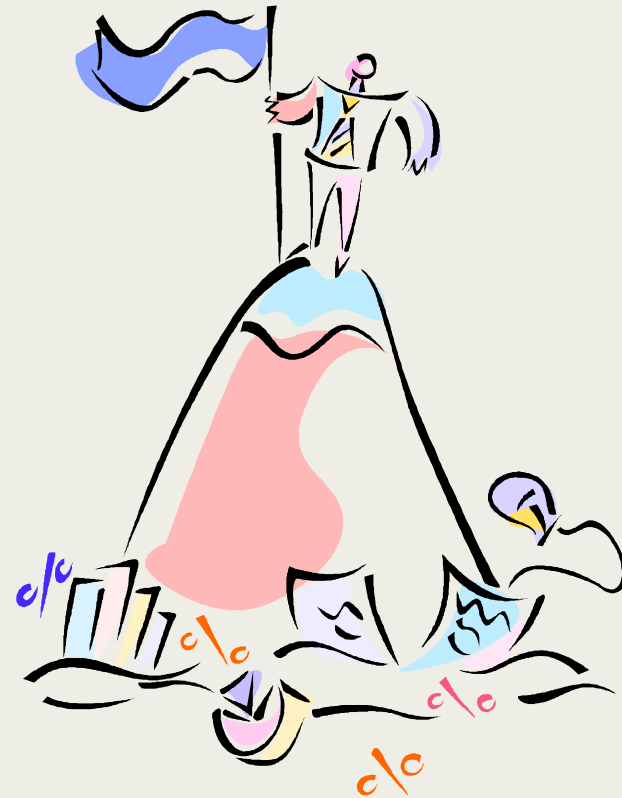
# Benchmarking Appraisal

Purpose: Document a frequently sought, high level, benchmark for an organizational unit.

Description: Expert-directed and team-based, data intensive, broad scope, deep coverage method that emphasizes use of objective evidence - with strong focus on sufficiency of coverage.

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# SCAMPI B&C Lead Appraisers-1

**Eligibility:**

Employees of SEI SCAMPI Partners
- under supervision of a SEI qualified supervisor (SCAMPI A Lead Appraiser authorized by SEI)

**Requirements for New SCAMPI B&C LA:**

Participate in 2 SCAMPI B appraisals; pass courses; be observed by supervisor (report to SEI)

**Training:**

Existing SCAMPI A LAs: ½ to 1 day delta course

New SCAMPI B&C LAs: CMMI Intro and Intermediate  and SCAMPI B&C SLAT courses

# SCAMPI B&C Lead Appraisers-2

| | |
|---|---|
| **Renewal Requirements (SCAMPI A and B&C LAs):** | SCAMPI A LAs: Lead 1 SCAMPI A appraisal and<br>• Participate in a combination of SCAMPI A, Arc Class B or C appraisals and/or other leadership activities*<br><br>SCAMPI B&C LAs: Lead 1 SCAMPI B appraisal and<br>• Participate in 1 SCAMPI A, , Arc Class B or C appraisals and/or other leadership activities |
| **Upgrade to SCAMPI A LA:** | Lead 1 SCAMPI B appraisal; participate in 1 SCAMPI A appraisal; pass A SLAT and be observed by SEI. |
| **Reporting:** | B/C Appraisal Disclosure Statement and SCAMPI B/C results |
| **License Fees:** | SCAMPI A LAs – No change in fees<br>SCAMPI B&C LAs – Fee TBD |

\* See SEI Appraisal Program Notification N-0009

# SCAMPI B&C Program Schedule-1

## SCAMPI B&C Handbook

- Draft                                    May 2004
- Stakeholder review              May-June 2004
- V1.0                                     Aug 2004

## Delta LA Training

- Draft                                    June 2004
- Pilot                                     June-Aug 2004
- V1.0                                     Sep 2004

## Formal B&C SLA Training

- Draft                                    Oct 2004
- Pilot                                     Oct-Nov 2004
- V1.0                                     Dec 2004

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# SCAMPI B&C Program Schedule-2

Appraisal Reporting System updates
- Design spec          May 2004
- V0.1                 June 2004
- Testing              June-July 2004
- V1.0 on line         Aug 2004

# Contact Information

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