Carnegie Mellon
Software Engineering Institute

Pittsburgh, PA 15213-3890

CMMI SM

SCAMPI B & SCAMPI C Methods: Initial Design Concepts and Project Status

Will Hayes
Gene Miluk

Sponsored by the U.S. Department of Defense

Appraisal Needs

Getting Started, Understanding the CMMI

Familiarization or Expectation Setting for Future Appraisal

Broad-based Information on Implementation of Practices

In-depth Analysis of Implemented Practices

Gap Analysis Focused on Findings of Previous Appraisal

Incremental Data to Track Improvement Progress

Benchmarking Leading to a Public Statement

Architectural Considerations

- Create an family of appraisal methods that:
  - Best covers the spectrum of needs
  - Allows organizations and LA to plan for a series of appraisals that best support their process improvement goals (e.g. incremental organizational and model scope)
  - Creates standards for B&C appraisals and the data generated from them

- Design these methods allowing the greatest level of "reusability" of appraisal effort and artifacts

- Integrate these methods so that organizational effort spent preparing for the appraisals and appraisal team effort conducting appraisals provides maximum value at minimum costs

CMMI Based Appraisals

The Appraisal Requirements for CMMI (ARC v1.1) defines three classes of appraisal methods.

- Class A - Benchmarking
- Class B - Mini-Appraisal
- Class C - Pulse Taking

Appraisal Method Classes

Characteristics	Class A	Class B	Class C
Amount of objective evidence gathered (relative)	High	Medium	Low
Ratings generated	Yes	No	No
Resource needs (relative)	High	Medium	Low
Team size (relative)	Large	Medium	Small
Appraisal Team Leader Requirements	Lead Appraiser	Lead Appraiser or person trained and experienced	Person trained and experienced

Project Objective

Operating within the ARC structure of A,B,C appraisals design, pilot and document a series of methods that meet as many of the community appraisal needs and design criteria as possible

Areas of Specification for Appraisals

1) Matching Information Need to Appraisal Enactment

2) Data Collection Mechanisms, and Sampling Processes

3) Nature of Outputs, and Techniques to Generate them

First Area of Specification

Matching Information Need to Appraisal Enactment

- Differentiating the three classes
- Listing of needs that can be met by appraisal types
- Listing of commonly used appraisal types

Data Collection Mechanisms, and Sampling Processes

Nature of Outputs, and Techniques to Generate them

Appraisal Types

Getting-Started Intervention

Mini Appraisal

Gap Analysis

Improvement Monitoring

Delta Appraisal

Incremental Appraisal

Benchmarking Appraisal

Sources of Objective Evidence

Instruments
- Organizational assets reflecting evidence of implementation of model practices (e.g., mapping tables)
- Questionnaires

Interviews
- Standard structured interviews; on-call interviews; follow-up interviews
- Exploratory or focused questions targeted at manager, practitioners and/or users

Presentations
- Briefings, demonstrations

Documents
- Hardcopy, softcopy, hyperlinks

Developing Information needs for Appraisal Types and Classes

B&C appraisal must conform to ARC requirements

Collect information necessary to meet the goals of the appraisal

Collect information necessary to provide reusable artifacts for future appraisals

Develop an information architecture that allows for the integration of these artifacts

Second Area of Specification

Matching Information Need to Appraisal Enactment

Data Collection Mechanisms, and Sampling Processes

- Discussion of data types, and the inferences supported
- Listing and descriptions of data collection techniques
- Methods for performing organizational analysis

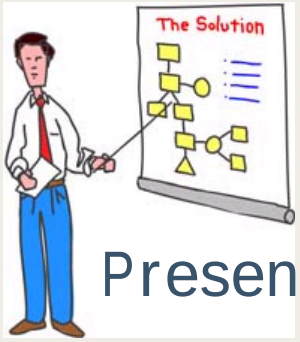
Nature of Outputs, and Techniques to Generate them

Data Collection Mechanisms

Instruments

Interviews

Documents



Presentations

"Organizational Unit" (OU)

"That part of an organization that is the subject of an appraisal (also known as the organizational scope of the appraisal). An organizational unit deploys one or more processes that have a coherent process context and operates within a coherent set of business objectives. An organizational unit is typically a part of a larger organization, although in a small organization, the organizational unit may be the whole organization."

Definition quoted from the MDD glossary: Derived from CMMI model glossary, ISO 98C and ARC v1.1

Method Strategies (Solution Space)

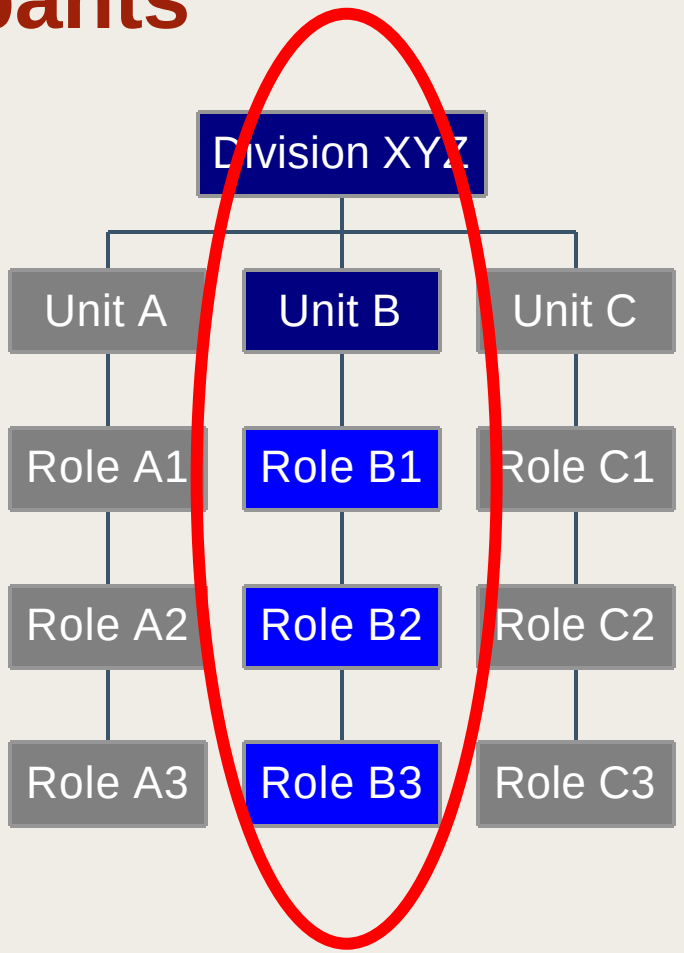
- Sampling
- Incremental Scope
- Coverage options

Sampling Participants

Whenever it is not feasible to involve every member of the OU, sampling decisions must be made.

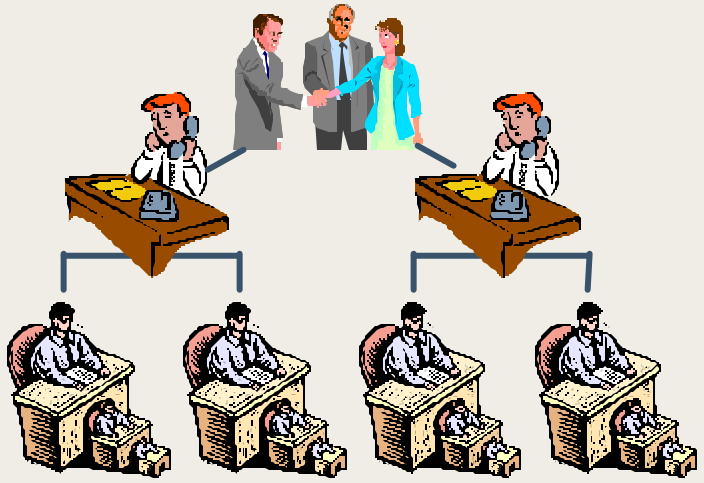
In choosing who to involve in which data collection activity, sampling decisions must be made.

Preserve a coherent scope for the appraisal, relative to the defining characteristics of OU.

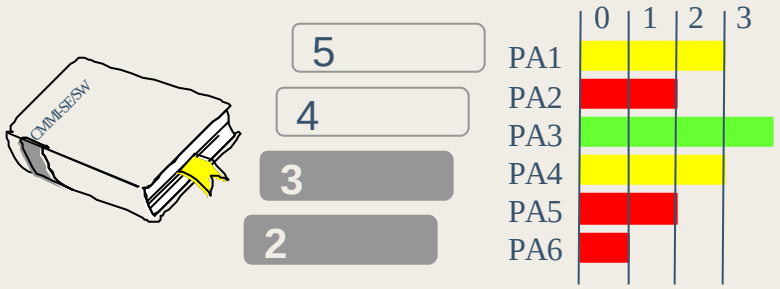


Appraisal Scope

Defining the
"Organizational Unit"



Selecting CMMI Model,
Representation, and Scope



Broad Scope, Shallow Coverage

Take advantage of low cost data collection methods

- achieve broader coverage of the organization
  - include all projects, not just 4 for benchmarking
- address a larger portion of the model
  - match information sources to information needs

Limitations of low cost data collection methods

- very limited opportunity to explain nuances
  - yes/no questions in interviews don't pay off
- difficult to assure validity of data
  - ambiguous questionnaire items don't help

Narrow Scope, Deep Coverage

Maximize insight with a small sample of the organization

- detailed insight about a selected unit in the organization
  - potentially include every staff member
- full coverage of limited model material (1 to 5 PAs)
  - minimal risk of undiscovered weaknesses

Limitations of using a small sample

- limited ability to make generalizations
  - process of one stellar project may be misleading
- limited coverage of the lifecycle in use
  - implementation of future phases may differ from intended practices

Third Area of Specification

Matching Information Need to Appraisal Enactment

Data Collection Mechanisms, and Sampling Processes

Nature of Outputs, and Techniques to Generate them

- Summarization and presentation mechanisms
- Intended uses of appraisal data

Required Outputs: SCAMPI B&C

Completed Appraisal Disclosure Statement (ADS)

Identification of data collection techniques used

Identification of data collection sessions conducted

Appraisal plan, annotated with actual data for

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

Expected Outputs: SCAMPI B&C

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

Characterizations of differences in practice implementation

- across model content covered in the appraisal
- across organizational units included in the appraisal

Detailed Data Profiles

	PA ->	RM	PP	PMC	SAM	MA	PPGA	CM	RD	TS	PI
Specific Goal 1											
	SP1.1	LI	FI	LI	NR	PI	FI	FI	LI	LI	FI
	SP1.2	FI	FI	FI	NR	LI	FI	FI	FI	FI	FI
	SP1.3	FI	FI	FI	NR	PI		FI		PI	FI
	SP1.4	FI	FI	NI		PI					
	SP1.5	FI									
	SP1.6										
	SP1.7										
Specific Goal 2											
	SP2.1		FI	FI	NR	PI	FI	FI	FI	FI	FI
	SP2.2		FI	FI	NR	PI	FI	FI	FI	FI	FI
	SP2.3		PI	FI	NR	PI			LI	LI	
	SP2.4		FI		NR	PI				PI	
	SP2.5		FI								
	SP2.6		NI								
	SP2.7		FI								
	SP2.8										
Specific Goal 3											
	SP3.1		FI					FI	FI	FI	FI
	SP3.2		FI					FI	FI	FI	PI
	SP3.3		FI						FI		PI
	SP3.4								LI		PI
	SP3.5								FI		
Generic Goal 2											
	GP2.1	FI	FI	FI	NR	NI	FI	FI	FI	LI	NI
	GP2.2	FI	FI	FI	NR	PI	FI	FI	FI	LI	LI
	GP2.3	FI	FI	FI	NR	PI	FI	FI	FI	FI	FI
	GP2.4	FI	FI	FI	NR	PI	FI	FI	FI	FI	LI
	GP2.5	FI	FI	FI	NR	NI	FI	FI	FI	LI	LI
	GP2.6	FI	FI	FI	NR	PI	FI	FI	FI	FI	FI
	GP2.7	PI	PI	FI	NR	NI	FI	LI	LI	PI	PI
	GP2.8	FI	FI	FI	NR	NI	FI	FI	FI	FI	LI
	GP2.9	FI	FI	FI	NR	NI	FI	FI	FI	PI	PI
	GP2.10	FI	FI	FI	NR	NI	FI	FI	FI	PI	PI
Generic Goal 3											
	GP3.1								LI	LI	PI
	GP3.2								PI	PI	PI

Reusable Artifacts

?

Project Status

Update provided at the conference