Carnegie Mellon
Software Engineering Institute

CMMI ᔆᴹ

A Family of
SCAMPI^{SM} Appraisal Methods

Will Hayes

Gene Miluk

Dave Kitson

Carnegie Mellon
Software Engineering Institute

Three Classes of Appraisals

Characteristic	Class C	Class B	Class A
Amount of objective evidence	Low	Medium	High
Ratings generated	No	No	Yes
Resource needs	Low	Medium	High
Team Size	Small	Medium	Large

Are We Talking About the Same Thing?

"Mini Assessment"

Carnegie Mellon
Software Engineering Institute
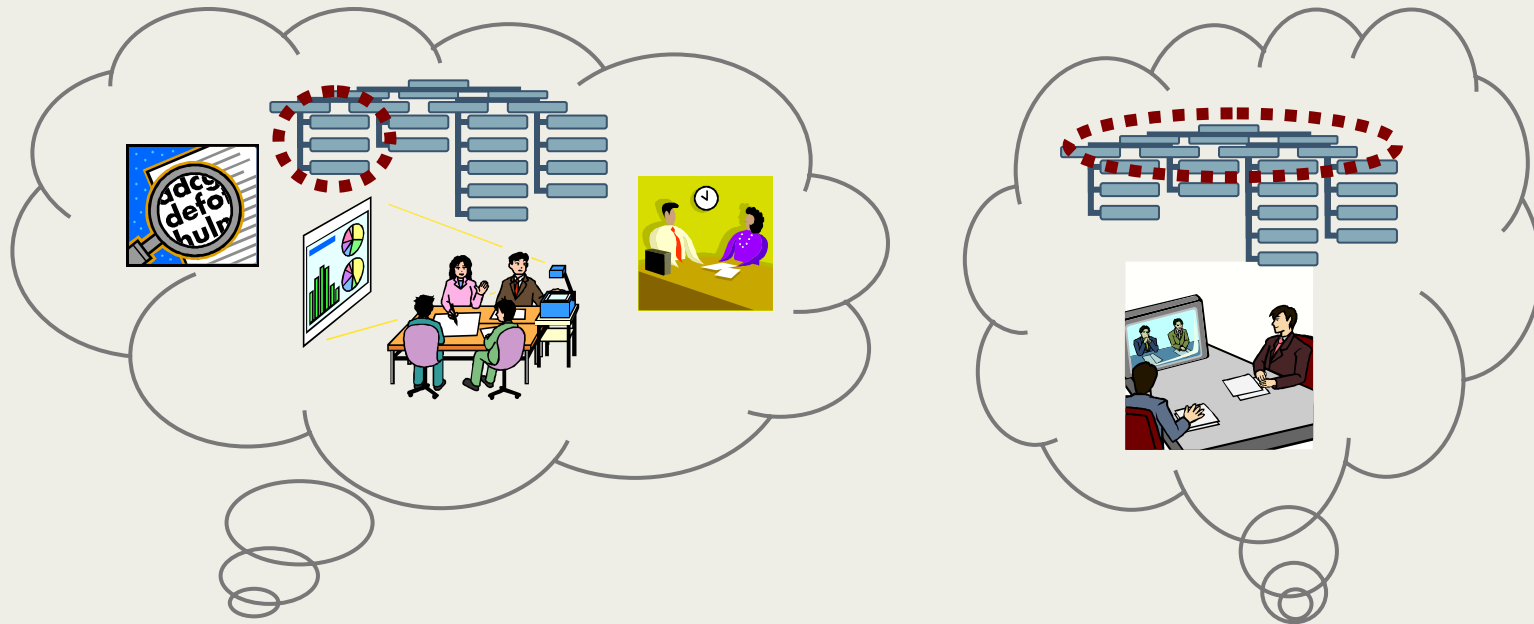
The SEI SCAMPI^{SM} B&C Project

Develop, Field Test, and Deploy an integrated suite of appraisal methods that are:

- Developed iteratively with extensive field tests
- Based on requirements from users
- Integrated and upwardly compatible
- Well specified and documented

Carnegie Mellon
Software Engineering Institute

Presentation Outline

Examples of Appraisal Types

Motivation and Purpose of Appraisals

Data Collection Techniques Used

Three Areas of Specification

wh SEPG03

Getting-Started Intervention

Purpose: Provide information to an organization learning about CMMI^{SM}.

Description: Expert-directed, presentation & discussion-intensive, broad scope, shallow coverage method that emphasizes participation of affected groups in facilitated sessions - with no focus on sufficiency of coverage.

Rough Effort Estimate: One to two experts on site for 1 to 5 days. Planning and coordination effort driven by appraisal scope.

Mini Appraisal

Purpose: An abbreviated version of a benchmarking appraisal used for experience and non-rating related outputs.

Description: Team-based, data intensive, narrow scope, deep coverage method that emphasizes the use of Objective Evidence and interviews - with reduced focus on data sufficiency.

Rough Effort Estimate: One expert on site for 3 to 5 days. Planning and coordination effort driven by appraisal scope, and experience level of local team members.

Gap Analysis

Purpose: Identify specific deficiencies in implemented practices relative to practices which would support achievement of the goals - for a specified scope.

Description: Expert-based, interview-intensive, broad scope, shallow coverage method that emphasizes identification of weaknesses - with more limited focus on sufficiency of coverage.

Rough Effort Estimate: One to two experts on site for 1 to 3 days. Planning and coordination effort driven by appraisal scope.

Carnegie Mellon
Software Engineering Institute

Improvement Monitoring

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

Description: Expert-based, interview & document-intensive, narrow scope, deep coverage method that emphasizes identifying status of changes in processes - with more limited focus on sufficiency of coverage.

Rough Effort Estimate: One to two experts on site for 1 to 3 days. Planning and coordination effort driven by scope and outcomes of previous appraisal(s).

Delta Appraisal

Purpose: Confirm corrective actions resulting from a benchmarking appraisal.

Description: Expert-based, interview & document-intensive, very narrow scope, deep coverage method that emphasizes confirming specific changes in processes - with limited focus on sufficiency of coverage for the model.

Rough Effort Estimate: One to two experts on site for 1 or 2 days. Planning and coordination effort driven by the nature and magnitude of weaknesses identified in the benchmarking appraisal.

Incremental Appraisal

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

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

Rough Effort Estimate: Appraisal events distributed over time. One expert on site for 3 to 8 days. Planning and coordination effort driven by appraisal scope, and experience level of team members.

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.

Rough Effort Estimate: One expert on site for 5 to 15 days. Planning and coordination effort driven by appraisal scope, organizational maturity, and experience level of team members.

Carnegie Mellon
Software Engineering Institute

Presentation Outline

Examples of Appraisal Types

Motivation and Purpose of Appraisals

Data Collection Techniques Used

Three Areas of Specification

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

Purpose of Appraisal -1

Formulating Our
Winning Strategy

Fixing Immediate
Problems

Exploring Goals for
Improvement &
Training Staff

Purpose of Appraisal -2

Motivating Supplier
Best Practices

Evaluating and
Monitoring Risk

Reality!

Fact-Based
Management

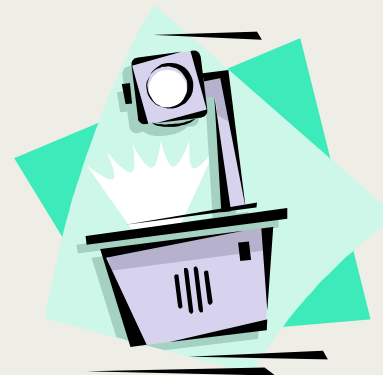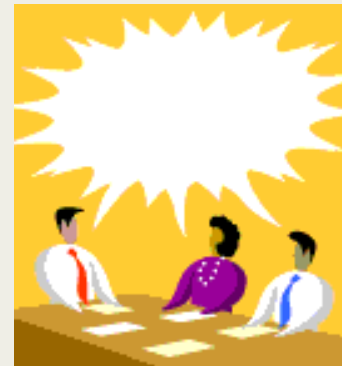# **Presentation Outline**
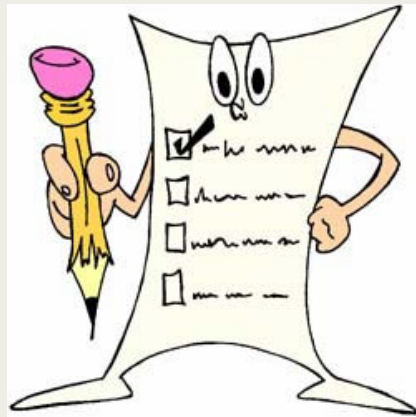
Examples of Appraisal Types

Motivation and Purpose of Appraisals

Data Collection Techniques Used

Three Areas of Specification

Traditional Data Collection Techniques

Evolution of Data Collection

Carnegie Mellon
Software Engineering Institute
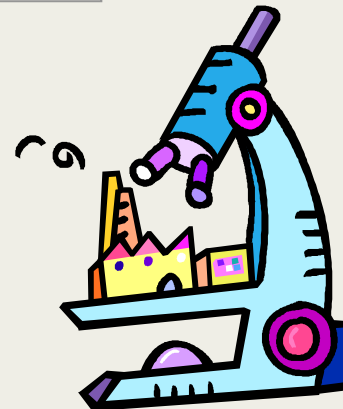
Presentation Outline

Examples of Appraisal Types
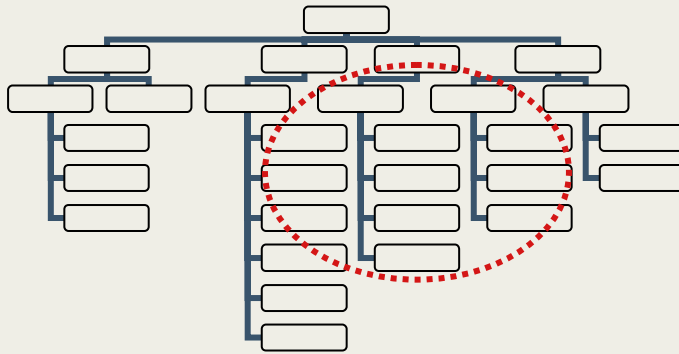
Motivation and Purpose of Appraisals

Data Collection Techniques Used

Three Areas of Specification

wh SEPG03

Requirements Based Tailoring
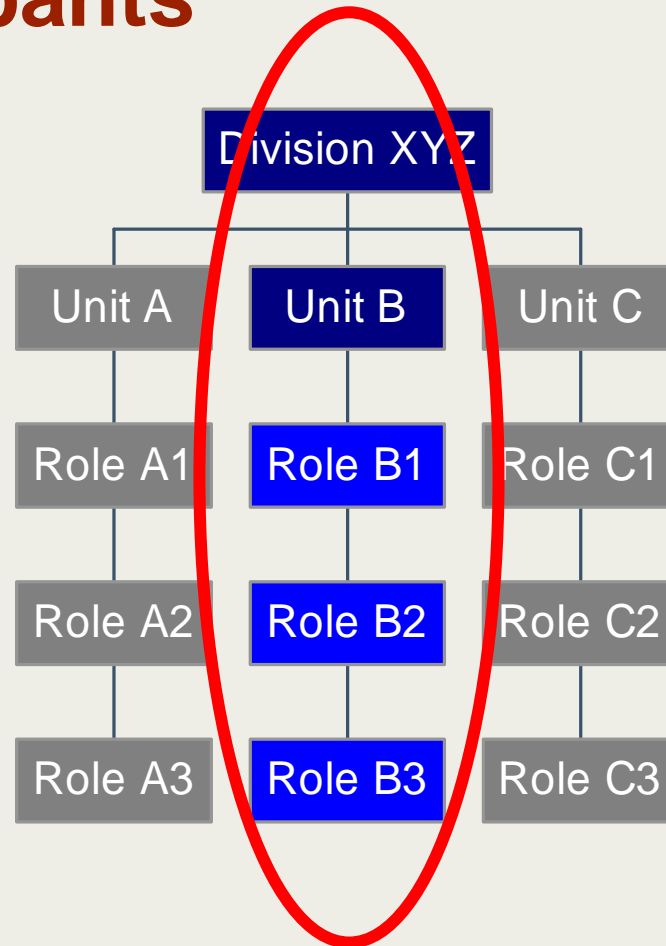
Level 2

Level 3

Level 4

Sampling Participants

Choosing who to involve in specific data collection activities requires one to make sampling decisions.

Preserving a coherent scope for the appraisal requires specification of meaningful sampling criteria.

Sampling:
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

Carnegie Mellon
Software Engineering Institute

Sampling:
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
  - 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

Summarizing and Presenting Results

Statements of strengths and/or weaknesses are most common.

Characterizations of differences in practice implementation
- across model content
- across the organization

Profiles of detailed data, or prioritized lists of statements are also common.

Your Results
- Findings statements
- Strengths/Weaknesses
- Recommendations
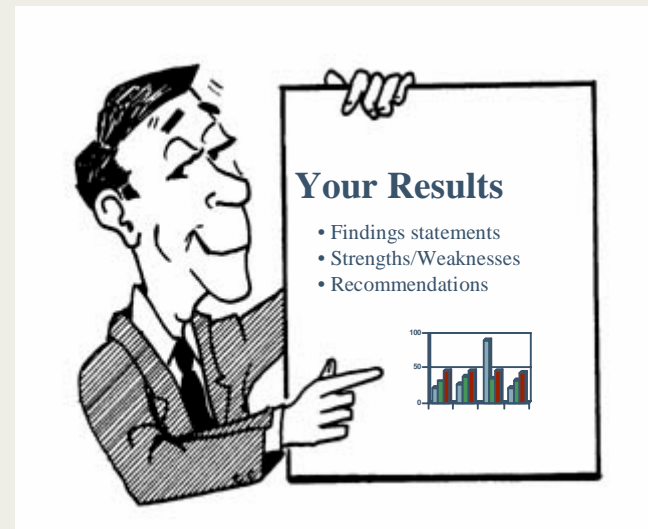
Carnegie Mellon
Software Engineering Institute

The SCAMPI^SM B&C Project

SEI working with appraisal stakeholders:
- prototyping and field trials with collaborator organizations
- communication with stakeholders about the project
- periodic dissemination of draft material for review
- publication/presentation of project results

Points of Contact
Will Hayes wh@sei.cmu.edu
Gene Miluk gem@sei.cmu.edu