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Experiences in the Application of MDD v1.3 Sampling Factors

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Topic Overview, Objectives

- Raytheon Missile Systems Organizational Unit overview
- About the v1.3 Method Definition Document (MDD) scoping and sampling provisions
- Case study: RMS' experience with applying scoping and sampling
- Experiences and Lessons
 - Questions
 - Biography

Raytheon Missile Systems CMMI® Background

■ Raytheon Missile Systems

- One business of Raytheon
 - Characterized by high-volume, complex systems--“Rocket Science”
 - A large organization
- Appraised at Maturity Level 5 for CMMI® for Development version 1.2 +IPPD in 2009
- Next appraisal in 2012
 - Selected CMMI-DEV v1.3 using v1.3 of the Method Definition Document (MDD)
 - To use MDD v1.3, we must satisfy the scoping and sampling provisions

Summary of v1.3 Sampling and Scoping

- MDD version 1.3 calls out scoping and sampling in section 1.1.4 (Implementation Guidance)

- How does this guidance affect my organization? (How bad is it?)
 - Sources of information
 - Software Engineering Institute (SEI) webinars
 - SEI staff and others at conferences
 - Lots of reading of the MDD and its appendices
 - Try things
 - Ask questions!

Applying MDD v1.3 Sampling Factors

- Sampled projects / basic units (always were) representative of the *Organizational Unit (OU)*
- Define and evaluate dimensions which cause behavior within OU to vary
 - Set of required (to be considered) *sampling factors* is described in MDD Appendix F
 - Select those sampling factors which make a difference in process execution in your OU
 - Use sampling factors to determine your *subgroups*
 - Determine whether *support functions* exist in your organization
 - Use selected sampling factors, subgroups and support functions to construct a representative sample of your OU
 - Document these in your appraisal plan and package
 - Might result in more, or fewer, instantiations than appraisals conducted under MDD v1.2

Note: Terms in italics can be found in MDD glossary

For instance, “Basic Unit,” “Sampled Basic Unit (SBU),” “Support function,” “[Sampled] Subgroup”

Tips for Applying the v1.3 Sampling and Scoping Provisions

- Become familiar with the case studies in MDD Appendix F
- Gather information about your OU
- Construct various scenarios related to your own organization
 - Remember to base appraisal objectives on your goals
 - Peer review
 - Have others ask questions
 - Iterate as necessary
- Vary parameters and OU dimensions to see how factors affect your appraisal
 - Constraining the OU is a useful tool
 - You may find that two appraisals is a better solution than one big appraisal
- Declare and use appropriate support functions to reduce instantiations
 - Effort is required to initially adjudge whether appropriate to declare a support function
 - Probable effort savings over the appraisal life cycle

- Don't give up!

Once Approach is Decided, Share with Stakeholders

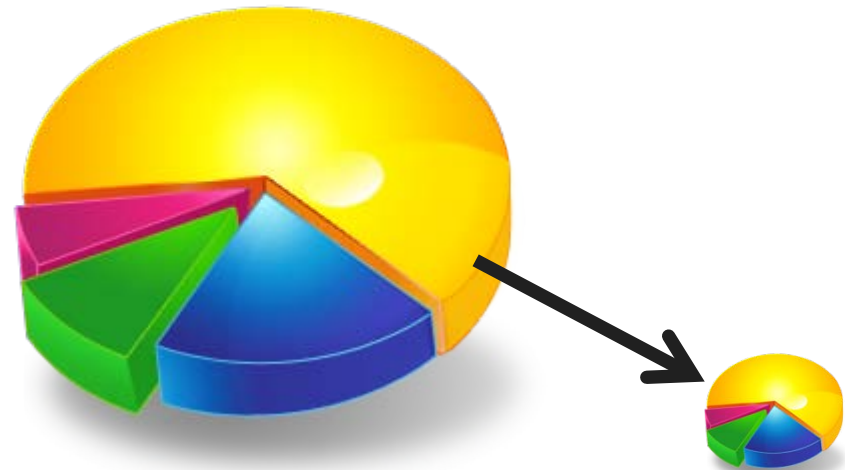
- Share approach with lead appraiser
 - Process will be iterative
 - Don't assume your lead appraiser has already applied all the provisions of sampling and scoping at other sites
 - Your OU is (probably) unique

- Share with appraisal team
 - Also iterative process
 - Start with internal team members
 - Use internal members to educate external team members
 - Involve all members of team
 - Including any who don't often lead
 - Ensure understanding and buy-in

- Share with other stakeholders
 - Appraisal team members can brief sponsors, managers, basic unit leaders

Sampling Factors to be Considered

- The MDD requires organizations to construct a representative sample of the organization. Sampling factors serve to identify meaningful differences in the conditions under which work is performed in the organization. The following sampling factors must be considered:
 - Location
 - Customer
 - Size
 - Organizational Structure
 - Type of work
 - [Others]



Case Study: RMS Application of SEI Sampling Factors

RMS appraisal team considered the potential influential contributors to variation in the conditions under which our work is performed.

Sampling Factor	Applicability to RMS
Location	Single location, scope of appraisal is defined as “RMS, Tucson, Arizona.”
Customer	Product lines account for different customers.
Size	Period of performance accounts for size.
Organizational structure	Product lines account for different organizational structure.
Type of work	Tiers account for the type of work.

Case Study: RMS Factor Analysis Summary

- All criteria which are within scope are subsumed by RMS program tiers
 - RMS has defined “tiers” as categories of like programs based on their end use
- The RMS appraisal team mapped sampling factors and selected tiers as the critical factor used to attain the representative sample for RMS

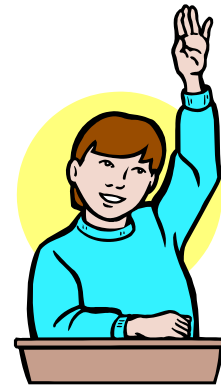
Observations and Experiences

- Become familiar with the intent and details of the sampling algorithm
 - Examples and case studies helped us more than explanations
 - Some of our most applicable examples came from Services rather than Development
 - Always go back to the MDD explanations to understand what flexibility exists

- Version 1.3 will probably drive a change in your appraised set of instantiations
 - More diverse work and project / basic unit types can anticipate a more complex appraisal, or more separate appraisals
 - More consistent, homogenous organizations probably have a smaller appraisal burden using v1.3

- Support functions can reduce the appraisal burden
 - You must decide which support functions are appropriate to declare for your appraisal
 - Gain consensus with the appraisal team regarding the use of support functions in your appraisal
 - Invest early work to demonstrate support function appropriateness to save downstream work over the appraisal lifetime
 - You can still appraise support function disciplines the “traditional” way

Questions?



Presenter Biography

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Recent roles

- Raytheon Missile Systems CMMI project team
- Raytheon Business Point of Contact to SEI
- Member of several CMMI appraisal teams

28 years
engineering
experience

- Functions: software, systems engineering, program management liaison, process improvements
- Industries: cell phones, industrial automation, missile systems
 - 3 patents – high-reliability systems, redundancy, inter-process communication

Personal

- Long-time science fair judge
- Officer of the International Lilac Society
- Together with his wife Debbie, is a rated geocacher in the desert southwest
- Cat rescue