



Process Appraisals with Procurement-Oriented Reusable Results

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Topics: Procurement-Oriented Reusable Appraisals

- Appraisals: Disadvantages and Advantages
- Appraisal Reuse Advantages
- Appraisal Reuse Principles
- Appraisal Reuse Methodology
- Appraisal Data Reusability
- Appraisal Reuse Infrastructure
- Contractor Data Submissions

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CMM-Based Appraisals

- Two primary CMM appraisal methods
- CMM-Based Appraisals—Internal Process Improvement (CBA-IPI)
 - Motivation: Foundation for process improvement
 - Normally performed by an internal team
- Software Capability Evaluations (SCE)
 - Motivation: Process risk evaluation
 - Normally performed by an external team

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Appraisal Disadvantages

- Potentially quite expensive
 - \$10,000 to “\$100,000”+
- Potentially quite time-consuming
 - From initial planning through final report completion may require several months
- Potentially disruptive to the involved projects and personnel
- Can be highly distracting

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Appraisal Advantages

- Provide insights into
 - Internal: Strengths and Weaknesses
 - External: Compliances and Non-Compliances
- Provide a foundation for risk identification, management, mitigation, and contingency planning
- Motivate and focus the organization
- Catalyst for process improvement

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Appraisal Reuse Advantages

- Appraisal advantages notwithstanding, *excessive appraisals* result in *excessive costs* and *excessive effort*
- In addition to providing a foundation for process improvement, reusable appraisals
 - Can be used by *contractors* as valuable supplemental material for proposals
 - Can be used by *procurement officials* for enhanced contractor selection & monitoring

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Appraisal Reuse Advantages

- For procurement officials
 - Substantially reduce the *agency's* cost, effort, and resources required to determine and monitor contractor process capability (compared to SCEs)
 - Potentially reduce the *contractor's* costs (and ultimately, agency costs) associated with demonstrating process capability

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Appraisal Reuse Advantages

- For software executives
 - Directly plan and control frequency, type, schedule, resource impacts, and costs associated with process appraisals
 - *Respond* to strategic opportunities (in addition to tactical requirements)
 - *Amortize* appraisal costs across multiple government (and other) customers
 - *Realize* multiple benefits from appraisals (e.g., enhanced proposals; marketing)

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Appraisal Reuse Principles

- For procurement officials
 - *Treat all contractors equitably*
 - Ensure your agency's processes for appraisal reuse are *repeatable* and well *defined*
 - Encourage contractors to *conduct their own appraisals* and submit resulting and supporting data
 - Use a scalable approach that maximizes *early* and *accurate capability confirmations*

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Appraisal Reuse Principles

- For software executives
 - Use a *strategic, business-driven, balanced* approach alternating between
 - Quick sampling and comprehensive appraisals
 - Internal and external resources
 - Larger and smaller projects
 - Existing and desired customers
 - *Reduce/eliminate the need for procurement organizations to conduct Software Capability Evaluations*

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Appraisal Reuse Methodology

- Objectives (*Appraising Organization*)
 - Maximize cost reductions to the government
 - Maximize cost reductions to contractors
 - Achieve repeatable, consistent, equitable, and accurate results
 - Achieve capability confirmations at the earliest opportunity
 - *Make every reasonable effort to avoid unnecessary Software Capability Evaluations*

Appraisal Reuse Methodology

- Phase 1: Appraisal & Organizational Data
- Phase 2: PI History & Infrastructure Data
- Phase 3: Onsite Briefings
- Phase 4a: Document Reviews
- Phase 4b: Interviews
- Phase 4c: Engineering Floor Walkthroughs
- Phase 5a: Accelerated SCE
- Phase 5b: Comprehensive SCE

Phase 1: Appraisal & Organizational Data

- Ask (all) contractors to submit, for any appraisals conducted during the prior one to three years, copies of the appraisals'
 - Final Findings Presentation
 - Final Findings Report
- Ask for an organization chart clearly showing the locations of and the relationships between the appraised organizations and the bid or performing organization



Phase 1: Appraisal & Organizational Data

- Review appraisal data and determine if it passes data reusability criteria (discussed in the following section)
 - If YES: Release contractor from this cycle of monitoring; inform them of the next cycle commencement date; update your files
 - If NO: Assign contractor to the nearest next Phase that is likely to provide the necessary supplemental information to allow capability confirmation (ideally, Phase 2)

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Phase 2: PI History & Infrastructure Data

- Use this Phase to clarify and augment any appraisals that were marginal or which appeared to fail to meet minimum reuse criteria
- Request process improvement historical information such as
 - Prior year Process Improvement Plan
 - Current year Process Improvement Plan
- Request process improvement infrastructure information relating to Management Steering Committees, Software Engineering Process Groups, etc.

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Phase 2: PI History & Infrastructure Data

- Use the Phase 2 data submission *in combination with* the appraisal information submitted for Phase 1
- As before, review all data and determine if it passes data reusability criteria
- If sufficient to confirm capability, then you are done; otherwise assign the contractor to a subsequent Phase

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Phase 3: Onsite Briefings

- Use Phase 3 to clarify any outstanding issues, especially with regard to relevancy, consistency, and objectivity
- Negotiate applicable topics with the contractor for a contractor-provided set of briefings to address outstanding issues
- Attend briefings, ask questions, and again attempt capability confirmation

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Phase 4: Selective Audit

- Phase 4 consists of
 - Document reviews only (4A)
 - Document reviews and interviews (4B)
 - Document reviews, interviews, and engineering floor walkthroughs (4C)
- Select *one* approach—if unable to confirm capability then your only remaining option is to conduct a Software Capability Evaluation (Phase 5)



Phase 4a: Document Reviews

- Select this approach if you want to confirm ongoing compliance even though
 - Appraisal data appears rather dated
 - There have been one or more management changes or reorganizations
- Ask to review current plans, procedures, and evidence from
 - Previously appraised projects
 - Projects of interest



Phase 4b: Interviews

- Consider selecting this approach if there appears to have been significant management, functional area specialist, or technical personnel changes since the appraisal was conducted
- Conduct interviews in a manner similar to interviews conducted for a SCE



Phase 4c: Engineering Floor Walkthroughs

- Consider selecting this approach when you suspect that the organization may have “excessively prepared” for the appraisal(s) or for any prior Phases
- As with any Phase, if you are relatively sure that the Phase will *not* allow you to confirm capability, then skip the Phase

Phase 5a: Accelerated SCE

- At this point you have made at least one attempt, and possibly several attempts, to avoid an unnecessary SCE
- Decide if you can conduct an accelerated SCE (Phase 5a)—or if a comprehensive SCE (Phase 5b) is required
- Select an accelerated SCE if you are interested in only a subset of Key Process Areas, or in a rather small organization

Phase 5b: Comprehensive SCE

- If you need to confirm a Capability Level, and you do not have reusable appraisal material, then you'll need to conduct a CAF-compliant SCE (or wait for the submission of reusable material)
- Phase 5 is the *only* Phase that actually determines and assigns a Maturity Level (other Phases merely confirm a contractor's claim of compliance)

Summary: Appraisal Reuse Methodology

- Phase 1: Appraisal & Organizational Data
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Appraisal Data Reusability

- Primary factors affecting reusability of the appraisal data
 - Objectivity
 - Timeliness
 - Relevancy
 - Consistency
 - Content
 - Collateral support



Objectivity

- Appraisals must be conducted as objectively as possible, using a team that is relatively free from conflicts of interest
 - External evaluators usually viewed as reasonably objective
 - Internal personnel from outside the assessed organization can also be objective
 - *Appraisal teams staffed by organizational PI or management personnel may be viewed as having a conflict of interest*



Timeliness

- Appraisals are a snapshot of capability at a given moment in time
- All organizations are subject to varying degrees of change
- Over time, appraisals increasingly become a snapshot of *"how it used to be done"*
- Appraisals with the last 12 months are almost assuredly reusable, those over 2 years old are almost assuredly not



Relevancy

- Ideally, the appraised organization is *identical* to the organization managing and performing the agency's work, and the appraised projects *include* the projects performing agency tasking
- Relevancy becomes increasingly *uncertain*
 - As the number of interviewed personnel to total organization size becomes smaller
 - If appraised projects significantly differ from agency projects



Consistency

- To be reusable, *at least one appraisal must have been conducted in a CAF-compliant manner*, consistent with
 - CPA-IPI methodology and guidelines
 - SCE methodology and guidelines
- Even “quick looks” or other hybrid methods can have greater or lesser degrees of consistency with SEI/CAF process audit principles

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Content

- Ideally, the appraisal data will include everything you need to know
 - Maturity Level assignment
 - Credentials and background of the Appraisal Team
 - Appraised organizational structure
 - Appraisal scope
 - Appraisal methodology and activities
 - Project descriptions
 - Personnel roles and responsibilities
 - Detailed onsite interview schedule
 - Detailed compliances and non-compliances

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Collateral Support

- Collateral support includes everything that might help you better understand if available appraisal data is sufficient to confirm a contractor’s compliance claims
- Collateral support includes
 - *Proposing organization structure* and history
 - PI infrastructure
 - PI history (planned versus actual)
 - Updated project information and evidence

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Appraisal Reuse Infrastructure

- For an acquisition organization to systematically monitor a set of contractors *or sub-contractors* requires
 - Contractor Capability Monitoring (CCM) *Coordinator*
 - CCM *Review Team* (at least 3 to 5 people—potentially as a part-time or matrixed responsibility)
 - CMM *Data Administrator* (1 person, part-time or full-time)



Appraisal Reuse Infrastructure

- The CCM Coordinator and Review Team members should collectively have substantial education and experience in
 - Software development
 - Software project management
 - Software process appraisals
- Generally, all CCM personnel should be trained and qualified to conduct or support SCEs



Appraisal Reuse Infrastructure

- Example resource requirements (per contractor)
 - Phase 1: Team of 3; 1 - 2 hours (4 shrs +/-)
 - Phase 2: Team of 3; 2 - 4 hours (8 shrs +/-) *2X*
 - Phase 3: Team of 3-4; 2 - 8 hours (20 shrs +/-) *3X*
 - Phase 4: Team of 4-5; 8- 24 hours (80 shrs +/-) *4X*
 - Phase 5: Team of 5-6; 40-120 hours (400 shrs +/-) *5X*
- Note: even if a SCE is eventually required, time spent in prior Phases usually results in substantially more time saved during the SCE



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Contractor Data Submissions

- Applicability
- Framework Scope
- Organizational Scope
- Commitment
- Information Organization
- Creation, Release & Revision History
- Internal Checks & Balances



Applicability

- Generally, conduct appraisals that cover all areas of current and future customer interest
 - Projects showing *problem domain* expertise
 - Projects showing *solution domain* expertise
- Clearly document and highlight *management control* structure and paths
- Show *historical* and *current success*



Framework Scope

- Ideally, cover *more* than the minimum customer-required
 - Key Process Areas
 - Maturity Levels
- Strive to include Subcontract Management (to show lower-risk in the event of necessary future teaming)
- If using multiple frameworks, merge them into a cohesive approach (e.g., ISO 9000 & CMM)



Organizational Scope

- Clearly identify the appraised software organization in terms of projects, functional areas, and personnel included/excluded
- *Avoid excessive scale-up* of the appraisal (e.g., appraising 3 projects, interviewing 20 people, then asserting that 500+ people are compliant)



Commitment

- Generally, although there are no such applicable requirements at Level 2, most organizations still need to use
 - Process Improvement plans
 - Management Steering Committees
 - Software Engineering Process Groups
- Ultimately, management only spends money on top priorities



Information Organization

- Organize any requested data so that it is easy for the acquisition agency (CCM team) to *review, interpret, discuss, understand,* and *confirm compliance*
- Where appropriate, map information directly to CMM goals; optionally to CMM key practices
- Avoid contradictory organization charts



Creation, Release & Revision History

- Most process descriptions are subject to review, approval, and release cycles
 - Clearly show the history of evolving process descriptions
- Ensure that no critical process descriptions (or policies) are annotated as “draft” or “pilot release”
- Ensure all evidence contains accurate date and time information



Internal Checks & Balances

- Arguably, if you have a strong *Quality Assurance* function, you'll achieve, maintain, and readily demonstrate capability compliance
- Similarly, appropriate and timely *executive oversight* helps ensure ongoing compliance (and, as necessary, corrective actions)



Summary: Contractor Data Submissions

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Summary: Procurement-Oriented Reusable Appraisals

- Procurement agencies will find that *contractors are very receptive to and supportive of agency reuse* of contractor provided appraisal data
- Contractor submitted data often *clearly exceeds agency requirements* for objectivity, timeliness, relevancy, etc.
- *This appraisal reuse method is relatively easy for an agency to implement and staff*



Summary: Procurement-Oriented Reusable Appraisals

- Contractor organizations leveraging reusable appraisals can expect to see
 - Increased amount of material available for use in *proposals* and *marketing material*
 - *Greater* recognition of, and *acceptance of*, contractor assertions of *Process Capability*
 - *Reduced cost, time and distractions* caused by *unexpected* or *unnecessary SCEs*

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Summary: Procurement-Oriented Reusable Appraisals

If timely, objective, relevant, and otherwise *reusable appraisal data already exists*, it is in everyone's best interests to *leverage the data* and *avoid performing unnecessary SCEs*

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Contact Information

For additional information, or if you know someone who might be interested in hearing this briefing, please contact:

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Speaker Biography

Dr. Bechtold has over twenty years of progressive experience in the development, management, and improvement of complex software systems, architectures, processes, and environments. In addition to extensive software development and software project management experience, Dr. Bechtold's expertise includes all aspects of organizational change management, process improvement, process assessment, process definition and modeling, workflow automation, and managerial and technical training. Dr. Bechtold continues to work with both industry and government in the performance of Software Capability Evaluations, contractor process maturity monitoring, software process improvement, and acquisition process improvement. As the President and Principal Consultant of Abridge Technology, Dr. Bechtold provides subject-matter expertise on organizational change management to industry, government, research centers, and academic institutions, especially relating to organizational agility and high-velocity adaptation.

In conjunction with this work, Dr. Bechtold assists the IRS in contractor process maturity monitoring and has participated in numerous onsite process-audits of contractor facilities and resources. Dr. Bechtold has been a team member on nearly every SCE performed by the IRS since 1996. In addition to performing SCEs, he regularly assists the IRS in monitoring the contractors' processes for relative quality and risk. He helped with the original and ongoing design and implementation of the process used by the IRS to reuse contractor appraisal information. This process (PARM) has been used successfully by the IRS since 1996.

In addition to consulting, Dr. Bechtold teaches *Software Project Management* (SWSE 625) at George Mason University. This is a Masters Degree course cross-listed to the Ph.D. Information Technology degree. The course covers all aspects of successful software project planning, management, control, and recovery.

Dr. Bechtold's latest book, *Essentials of Software Project Management*, is published by Management Concepts, Inc. (www.managementconcepts.com)

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