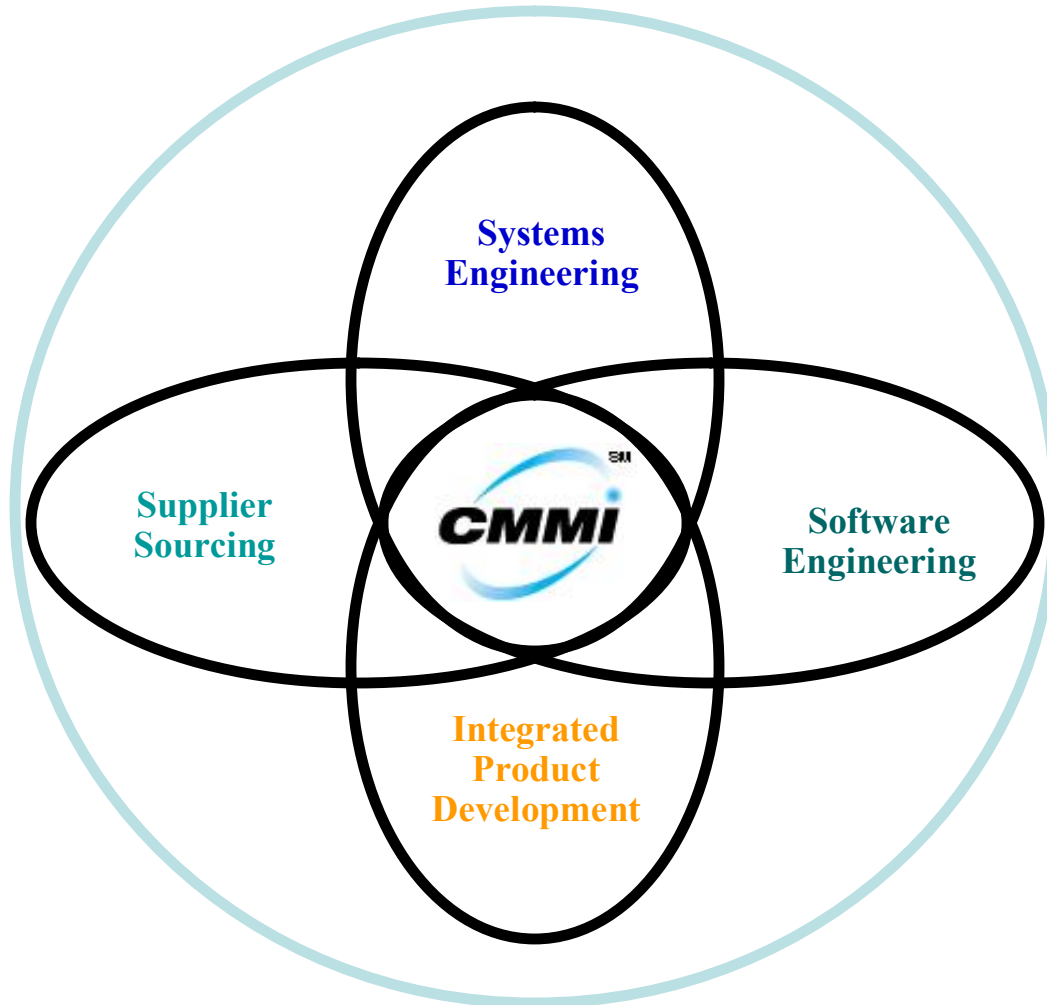**Integrated System Diagnostics**
INCORPORATED

Experiences Implementing Very Large, High Confidence Enterprise Appraisals

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Scope of Events Discussed

➢ **3 *very* large organizations in last three years**

➢ **SE/SW**
➢ **SW only**
➢ **SE/SW/IPPD**

➢ **Wide array of types of work. 2 Global, 1 U.S. Fed and State. 2 did not have external customer CMMI Level requirements. All deal with multiple frameworks. 1 has been doing CMM based improvement for a many years.**

Systems Engineering

Supplier Sourcing

CMMI

Software Engineering

Integrated Product Development

What is an Enterprise Appraisal?

◆ An event(s) that leads to a ratable Class A benchmark appraisal that includes multiple sub-units which in and of themselves are ratable OUs.

- Includes more than one sub unit.
- Includes corporate level organization units (above the typical OU scope)

◆ Why?

- Confirm standard process roll out and execution
- Gain competitive advantages
- Accept and work with reality of constant organizational changes

◆ **Is it one "big honking appraisal?" – No!!**

Stakeholder Concerns to Address

◆ Senior sponsor: "Is this going to bust our budgets? What's the benefit?"

◆ Business Unit sponsor: "I don't want to jeopardize *my* bonus!"

◆ Program Managers: "Why do I care about these *other* business units?"

◆ EPG members: "How can I support all these events and help people improve too!"

◆ Enterprise Lead Appraiser: "How do I ensure that all these appraisals are run effectively . I can't be on them all!"

◆ Lead Appraisers: "I don't want *my* appraisal at risk with SEI by doing some non-standard event… !"

◆ SEI: "We don't want any SCAMPI principles violated ot requirements missed, and we don't want organizations making crazy level claims!"

Several Innovations and Improvements

- Org (enterprise level) appraisal elements
- Incremental Data Reuse
- Org Sampling criteria
- PIID Refresh events (practice sampling)
- Verification Reviews

We will discuss these bullets throughout the presentation

- Strategic Appraisal Plan
- Central Appraisal Planning
- Implementation %Waves+
- Common tooling (and work instructions)
- Common training
- Common Interpretations
- Norming with Leads

Appraisal Goals . Enterprise Impacts
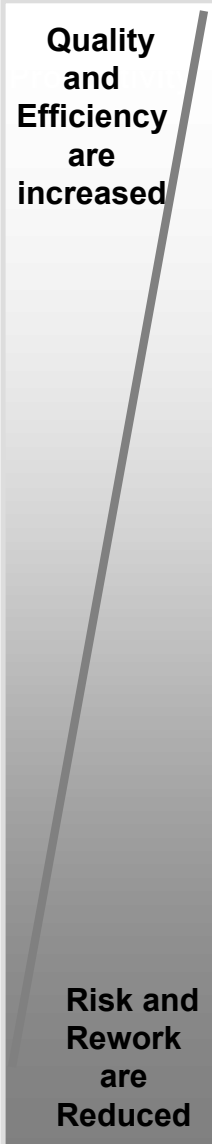
Common Goal	Sub-Goal	Enterprise Appraisal Implementation
Ensure results	Contribute directly to business improvement Comparable across companies/organizations	Increased *specificity* needed Comparability *required* Customer *"believability"* essential
Optimize value to sponsors	Support business objectives Optimize cost and minimize disruption	*Multiple* requirements must be satisfied Enterprise *"big picture"* focus
Ensure appraisal reliability	Create repeatable processes . standardize Make results predictable and differences explainable Results independent of team composition	*Objectivity* essential Use of external (non-OU) resources increases *Standardization* needed.

Slide adapted and updated from presentations by Mr. Byrnes while managing the appraisal project at the SEI.

Appraisal Goals . Business Unit SCAMPIs

◈ Provide a thorough, objective benchmark against the CMMI

◈ Baseline the process capability of each targeted business unit against the CMMI V1.1, Staged Representation, using the SCAMPI V1.1 method

◈ **Ensure events are led, managed, and executed in a manner that is**

  ▪ **ARC *compliant*,**

  ▪ **fully *defensible*, and**

  ▪ **results are *acceptable* to respective clients requiring reference model benchmarks.**

◈ **Ensure each entity receives appraisal assets that are *usable* by the business unit sponsor *independent* of any final Enterprise ML rating**

◈ Receive an official CMMI Maturity Level Rating from a team led by an external SEI Authorized SCAMPI Lead Appraiser

◈ Conduct each appraisal within schedules tailored in each appraisal plan to meet overall Enterprise *and* Business Unit specific appraisal objectives.

el Scope . Enterprise ORG

Level	Focus	Process Areas
5 Optimizing	*Continuous Process Improvement*	Organizational Innovation and Deployment Causal Analysis and Resolution
4 Quantitatively Managed	*Quantitative Management*	Organizational Process Performance Quantitative Project Management
3 Defined	*Process Standardization*	Requirements Development Technical Solution Product Integration Verification Validation **Organizational Process Focus** **Organizational Process Definition** **Organizational Training** Integrated Project Management Risk Management Decision Analysis and Resolution
2 Managed	*Basic Project Management*	Requirements Management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management
1 Initial		

Enterprise level entities reviewed separately or in conjunction with underlying unit Class A events.

Quality and Efficiency are increased

Risk and Rework are Reduced

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Reference Model Scope . Overall

Target Process Capability	Rating Baseline	Rating Elements	Other
(For each sub-unit SCAMPI) CMMI v1.1 Levels x and y, Staged Representation	Full Scope, Full Coverage with formal ratings of all Level x and y PAs Maturity Level rating required Joint ISD/client team	Maturity Level Process Areas Process Area Goals Generic practices Specific practices	Results of underlying business unit benchmark Class A appraisals and the Enterprise level risk appraisal (Class B) event and document review performed during the Readiness Review may be re-used, as applicable, within the team's appraisal database.
(For enterprise event) CMMI v1.1 Staged Representation, Organization process areas	Full coverage with process area ratings for Organization level Process Areas (OPD, OPF, OT, OEI)	Process Areas Process Area Goals Generic practices Specific practices	A sampling of practice implementation across prior appraised units will be re-validated as part of the Enterprise appraisal to ensure continued institutionalization of sub unit ratings [called PIID refresh events].
(For each sub-unit SCAMPI) (For enterprise event) CMMI v1.1, Staged	None	None	Resulting appraisal artifacts from underlying SCAMPI Class A predecessor events will be verified by the Enterprise Lead Appraiser for ARC compliance.

Data reuse

Practice Sampling

Asset Verification

Org Scope . 3 Primary Event Types

Company	Business Unit	Location	Site visit dates
<Very Large Company X>	<Named> Sector <Named> Organizational Units	Multiple locations throughout the United States.	Multiple throughout <several years> **Many sub unit Class A's**
<Very Large Company X>	<Enterprise Organization entity>	<On site City, State>	<on site peric **Enterprise Level "O" appraisal**
<Very Large Company X>	<Named> Sector Some <Named> Organizational Units [PIID refresh events]	Varied	<On Site Period> and other dates within 3 months of enterprise SCAMPI **PIID Refresh events**

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Organization Scope . Enterprise SCAMPI

For the enterprise level SCAMPI, the Organizational infrastructure entities appraised in entirety or in part:

- ◆ Senior Leadership
- ◆ Enterprise Process Group (EPG)
- ◆ Quality Management and Delivery Assurance
- ◆ Human Resources
- ◆ Organizational Training
- ◆ Knowledge Management (infrastructure and tools)

Entities in large organizations typically above the division level that create, deploy, and maintain common assets across the whole enterprise.

Enterprise Appraisal Results

◈ The *Enterprise* SCAMPI Class A event results in

- Process Area ratings for OPF, OPD, and OT for organization entities
- An *overall* Enterprise Maturity Level rating based on the *combined* results of the Enterprise SCAMPI and the results of each underlying Wave 1 Business Unit SCAMPI Class A.

◈ The Enterprise SCAMPI Class A event does ***not*** re-benchmark underlying business unit SCAMPI results.

- Each sub-unit has been rated *separately* with full coverage and its own ADS
- Where appropriate (ratings outside 90 day Enterprise event window), PIID Refresh events are conducted to *confirm capabilities* are still in place.
- Business Unit Class A appraisal assets and results are *verified* to ensure *adequacy*, *completeness*, and ARC *compliance*.

Appraisal Considerations

Appraisal practices (examples)	Implementation issues, risks, and recommendations	Appraisal considerations
Plan the Process (GP 2.2)	Organizations often don¢t know how much data is needed relative to prior events when increasing scope.	Must engage outside Lead sooner. Do Central Appraisal Planning. Sampling strategies need to be documented. Align goals across units, not just within. Use historical appraisal data for estimating.
Identify and Involve Stakeholders (GP 2.7)	Very broad set of stakeholders. Easy to miss key people. May involve groups not previously part of appraisals.	When õnewö groups involved, they exhibit õlow appraisal maturityö despite organization overall process capability. More prep time needed. Do training even if they already had it.
Establish a Defined Process (GP 3.1)	Organizations often focus on procedures *within* processes, rather than with interfaces, coordination, synergy, and integration across.	Need documents that describe connections across process elements and organizational boundaries.
Review Status with Higher Level Management (GP 2.10)	Many issues and decisions can be driven down to lower levels appraisals.	Manage the effort like a project. Decompose the problem. Track metrics. Set norms up front.
Manage Configurations (GP 2.6)	Data across company in multiple repositories. Significant IT, security and archival concerns and needs.	Need for good CM to manage incremental appraisal database build up and reuse over several events. IT infrastructure critical.

Addressing Risks

Risk	Factors	Actions
Maintaining senior mgt. commitment	Caused by turnover or mergers Caused by management changes Issues resulting from shifting investment priorities	Dual or tri-sponsorship for major events . enterprise, EPG, Business Unit . interfaces established
Middle mgt. resistance	Overriding pressure for project performance; Incentives on delivery, not quality Focus on Level rather than improvement	Assign EPG TPOCs for each unit. Minimize disruption.
Inappropriate or conflicting goals	Focus on Level rather than improvement Business Unit Level x goal, Enterprise level y goal	Ensure each major sub unit is intervened with. Tailor events . not force single approach.
Unrealistic expectations	All OUs benchmarked by year end in the 4th quarter. Start Up projects Level x by year end.	Spread events over long period. Establish incremental strategy and roll up. Define %wave strategy.
Crash implementations	PIID mania. Big bang appraisals. Process in a box.	Lots of efforts on going at any one time. Not one %mega+effort. Several methods in tool kit.

Risk Management Activities

◈ Spend extra time up front defining the organization scope, strategy, approach, and techniques. How much time? Years! *(this is not a tactical effort!)*

◈ Integrate outcomes from a series of events for each business unit (swim lanes). Affinitize units into "waves,+for deployment and benchmarking. *(this is practical!)*

◈ Standardize appraisal assets for use by a commonly trained set of appraisers, using a central appraisal planner. *(these are essential and sometimes learned after the fact!)*

◈ Norm the set of Leads . each Lead¢ ways of doing business on a one-off needed to adjust slightly. *(this is challenging!)*

◈ Involve the SEI throughout, at key pivot points *(this was hard!)*

...gger B's, smaller A's, appraisal lifecycle model
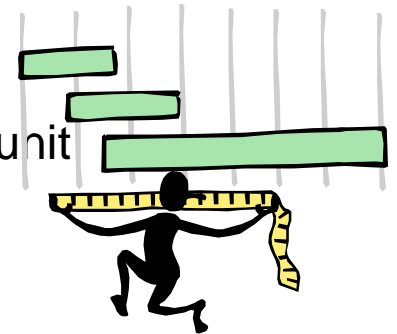
Example Appraisal Team Set Up

Appraisal Event	Team Size	Days on site	Team Comp.: External – External to OU – Internal to OU	Effort hours /Team Member (normative)
Class A	6-8	5-7	At least 2 totally external, ½ non OU	45
Class B	6-8	7-10	Tried to have same team as A	64
Class C	1-3	3-5	Usually internal or expert driven	24
Readiness Review	4 or more	5	½-1.0 size of A	40
PIID Refresh	4	3-4	½ the size of A; all from A team	24

Trends

# What's a Wave?

◈ Due to size and complexity of the organization, processes and process improvement activities can be deployed in "waves."

- Mechanism to prioritize EPG involvement
- Mechanism to focus organization improvement where end customer or project specific needs are most pressing
- Establishes and exceeds reasonable percentages for organization coverage for enterprise and separate business unit ratings
- Accounts for reality that not all programs will be at same maturity state at same time
- Ensures process deployment across entire Enterprise
- Reduce risk, increase success rate, manage complexity

◈ Assumption: Not all units targeted will be at the same stage of maturity, or readiness for change, or ability to implement changes.

...e just the high level flow – there was much more detail

Conceptual Diagram . Deployment "Waves"

Significant time spent with Enterprise Lead discussing sampling appropriateness
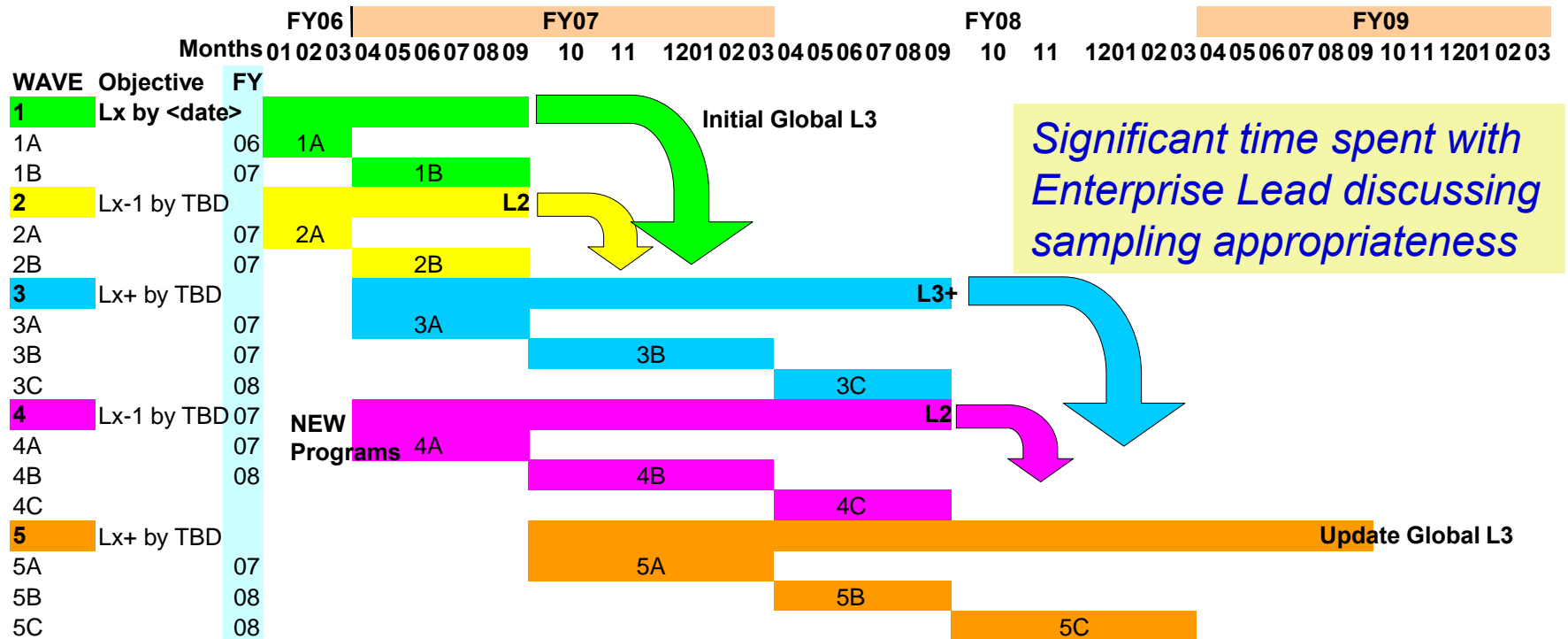
Notional timing for discussion and illustration purposes only

What's a PIID Refresh Event?

◈ Purpose: Verify process still in place and implemented for a previously benchmarked unit.

◈ Need: Can't realistically perform all required Class A events in a 90 day pre-Enterprise Class A window due to

- Business unit specific needs and objectives
- Resource constraints
- Practical project work flow issues

◈ Timing: performed within 90 day window of Enterprise Class A

◈ Timing criteria relative to last successful Class A benchmark

- 0-3 months: use underlying data as is . full reuse
- 4-12 months: do PIID refresh to confirm current status
- >12 months: do full Class A event

...is is just the high level criteria – there was much more

PIID Refresh Guidelines/Criteria

Environmental Attribute	Current State Relative to Benchmark Event	Risk to Incremental Appraisal Outcomes	Risk Mitigation Activities
Major re-organizations	None/List specific change, date, and impact	Low/Medium/High	<Describe actions taken>
Major acquisitions			
Major changes in standard process			
Significant changes in plans/scope of appraised projects			
Senior Management changes			
Organization restructuring			
Process implementation changes			

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was an entire Appendix and an embedded document
Strategic Appraisal Plan dedicated to this topic.

What s a Practice Sampling Plan?

◆ Purpose: Tailor follow on appraisal event to minimize cost and disruption on an organization that has already successfully executed a full Class A but must participate in the Enterprise event.

◆ Approach: Obtain maximum *actual* OE coverage through optimizing a tailored set of practices reviewed. Pick %heavy hitter+and %repetitive+practices. Use precedence and dependency relationships inherent in the model. Example:

Level	Process Area	Goal	Practice	E L	O U	Decision Criteria Rationale
2	REQM		SP 1.3	X	X	Need to be able to manage changes and reconcile project issues as they change and ensure all relevant assets are getting updated.
			SP 1.5		X	
			GP 2.6		X	Making sure controlling requirements key.
			GP 2.8			Ensure Org level is collecting requirements metrics.
2	PP		SP 1.2	X	X	Estimates always an issue.
			SP 2.7		X	Plan updates affect everything else and will see the other goal 2 practices.
			SP 3.2		X	Reconciling tasks/resources always an on-going challenge.
			GP 2.6		X	Controlling changes to plans, estimates, etc. tends to be a typical issue area.
			GP 2.2			Ensure org level is getting plans from programs

What's an Asset Verification Review?

◆ Purpose: Ensure all underlying events leading to the Enterprise SCAMPI Class A event were performed with high quality and in accordance with all SCAMPI requirements.

◆ Approach: Develop and use a standard appraisal requirements checklist to perform reviews of all key appraisal deliverables for each event

- Plans, briefings, reports, ADS, etc.
- Document issues, recommendations and gaps as "findings" for corrective action.
- Issues in underlying events could potentially delay the final Enterprise outcome

Class A Requirements Checklist - Sample

Activity	Task	Requirements	Verification Notes	Verified
Analyze Requirements	Determine Appraisal Objectives	Identify Sponsor and Relevant Stakeholders	In Strategic Appraisal Plan Section 2.0	
		Document Business and Appraisal Objectives	In Strategic Appraisal Plan Section	
		Ensure Alignment of Appraisal Objectives with Business Objectives	In Strategic Appraisal Plan Section 3.0 and in Team In Brief and Organization In Brief	
		Determine and Document Appraisal Usage Mode	In Strategic Appraisal Plan throughout and in Team In Brief	

Objective Evidence Challenges

◈ Need common rules and guidance as to instantiations required.

◈ Need work instructions on
  ▪ how to present data,
  ▪ how much data is needed, and
  ▪ how the team is to record its review of the data.

◈ Need for automated tools increased . expansion in data elements, data reuse strategy, merging of data increases *need for different approaches to recording data*

◈ Organization Coverage: large units have a real challenge of showing institutionalization across the entity when only reviewing a small set of projects in a Class A . *how many instances is enough? What percentage of the unit is enough?*

◈ Functional Coverage: *there may be "org" groups that need to be covered at multiple layers of the overall enterprise (corporate, division, business unit).*

Model Interpretation Issues

◆ What is the "org" for OPD, OPF, and OT purposes?

◆ What makes up the "ratable" metrics repository?

◆ How "connected" must the enterprise be to the units? And vice versa?

◆ Team needs ability to "integrate" rather than de-compose [holistic perspective] for the Enterprise event.

Some Pitfalls and Take Aways

- ◈ Pitfalls
  - Dont assume everyone will understand on the first run.
  - All sub-units must buy into the approach as well, even if they have some specialized unit appraisal objectives.
  - Appraisal experience matters.
  - Team members that have worked with each other before matters.
  - Work instructions matter.

- ◈ Take Aways
  - Management support is *really* needed.
  - Communication vehicles *must* be routinely delivered.
  - Standard assets and common training *facilitate* easier comparisons.
  - Central planning helps ensure consistency
  - IT infrastructure for evidence collection, asset archive repository, and team activities is *essential*.

Key Organizational/Appraisal Challenges

◈ **Organizational**

- Too many models. Too many methods.
- Management drivers for *reduced* process improvement costs.
- Need to *increase* efficiency of both internal improvement activities and external appraisal efforts.
- Customer %disconnects+between %level achievement+and %project performance.+

◈ **Appraisal**

- Data element needs increase and morph with enterprise focus
- Some SCAMPI rules can actually get in the way
- Changes in method not fast enough to keep up with changes in organizational needs

Issues, Directions, and Opportunities

| Issues	SCAMPI V1.2 still focused on "single point appraisals," not set of integrated appraisals from an enterprise perspective
Directions	Starting second wave on 2 major accounts. Improvements in approach being documented now. Continue technical development
Opportunities	Technical approaches taken were considered a *great* success from all key stakeholders: Sponsors, EPG lead, Enterprise Lead Appraiser Interface with SEI for potential updates to SCAMPI

Questions and Answers
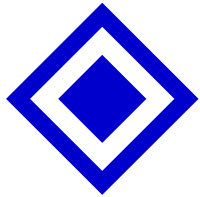
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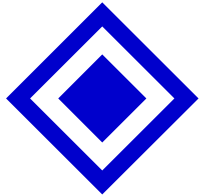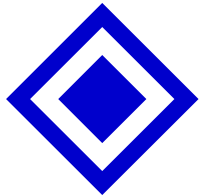
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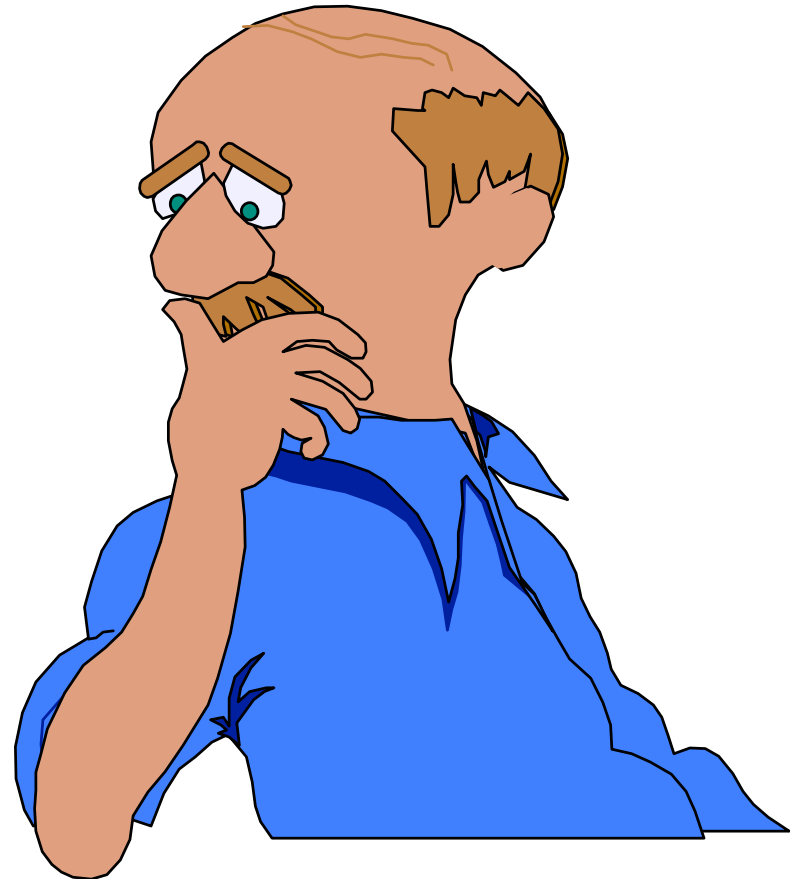
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- ▪ http://www.isd-inc.com
- ▪ Follow links technical presentations

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