Measurement and Software Process Improvement

- Work accomplished by subgroups
- Charge to subgroups
  - Issues
  - Audience
  - Obstacles
  - I-C-M beginning
- Except the CMMI Measurement and Analysis PA subgroup

Subgroups

- Measuring process instantiation, compliance, and impact
- Measurement across the organization
- CMMI Measurement Process Area

Subgroup 1: Measuring Process Instantiation, Compliance, and Impact

- Participants
  - Brad Clark
  - Don Dortenzo
  - Stephen O'Grady
  - Kevin Richins
  - Jay Rothman
  - Meredith Turner

Bob Chaney
Larry LaBruyere

Categories Considered

2. Showing value for SEPG and IT activities (getting process in place)
6. Integrating demands of "getting product out the door" and SPI
7. PSM and SPI - Making the linkage clear
8. Showing status and progress of SPI
9. Measuring effectiveness and compliance (do processes make a difference)

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PSM and SPI

SPI Plan

- ***Goals/Objectives***
- ***Success Criteria*****
- ***Strategy/Approach***
- ***Risks***

Adapt "basic" PSM guidance

SPI Activities

- ***Management of***
- ***Progress against goals*****
- ***Maintaining sponsorship*****

SPI Results

- ***Outcome*****
- ***Justification*****
- ***Effectiveness*****
- ***Impact/ROI*****

**** Requires new PSM guidance**

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Questions - 1

Questions	Stakeholders			
	Senior Exec.	SEPG	QA	Project Mgt.
What are the costs?	•	•		•
What is the ROI?	•	•		•
Are we achieving SPI goals?	•	•		
How long will it take?	•	•		•
How much effort / staff are required?	•	•		•
What are the risks?	•	•		•
What are the consequences of not starting?	•	•		
When are we done?	•	•		•
What are goal priorities?	•	•		
What will impact be to product, profit, and on going work?	•	•		•
Are you on SPI schedule?	•	•		
What is SPI earned value?	•	•		
What is status of SPI?	•	•		

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Questions - 2

When do we stop? (it is not working)	•	•		
How do I justify cost / schedule slip to customer?	•			•
How many processes have been instantiated this year?		•	•	
How are we performing against SPI plan (cost, schedule)?	•	•		
How many processes are defined toward achieving the Model level?		•		
What training is available?		•		
What is the training coverage for projects?		•		•
Are the processes being used?	•	•		
Why aren't the processes being used?	•	•	•	
How do we demonstrate improvement?		•		
How compliant are the projects with their process?			•	•

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Questions - 3

Is the SPI plan being followed? (Organization / Project)			•	
What impact will process have on project?				•
What value is process change?				•
What training is required?				•
What impact will process have on product quality?				•
What impact will process have on project schedule?				•
What impact will process have on project budget?				•
What is impact of backing out of process improvement?	•			•
What kind of tools are available to support SPI?				•
How is this going to affect the developer?				•

I-C-M Table (1)

Issue	Category	Measure
Schedule and Progress	Milestone Performance	Milestone Dates
	Work Unit Progress	Component Status Non-compliance Report Status Reviews Completed Process Change Request Status
	Incremental Improvement Capability	Improvement Content
Resources and Cost	Personnel	Effort Staff Experience Staff Turnover
	Financial Performance	Earned Value Cost
	Environment Availability	Resource Availability Dates
Growth and Stability	Project Participation	Projects involved in SPI
	Process Asset Library Size	Process Asset Library Items Process Change Requests

I-C-M Table (2)

Process Quality	Defects	Problem Reports Defect Density
	Process User Satisfaction	Incidences of Process Tailoring
	Customer Satisfaction	Number of Process Waivers "Survey Results"
Process Performance	Process Maturity	Reference Model Level Attained
	Process Effectiveness	Return On Investment Cost of Quality
	Process Compliance	Non-compliance Reports
Technical Adequacy	Resource Utilization	Process Asset Library Usage
	Technology Impact	Tool Usage Tool Evaluations
Training	Coverage	Courses Offered Staff Trained
	Effectiveness	Course Evaluations
Culture	Organizational Readiness	"Survey Results"
	Implementation Climate	"Survey Results"

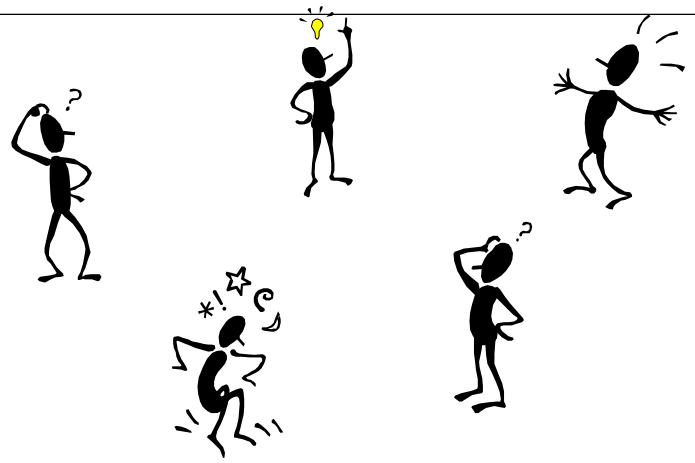
Conclusions

- PSM is relevant to measuring and managing SPI Initiatives
- SPI Initiative can be considered a project
- "Generic" PSM process applies to SPI measurement
- Basic structure and content of I-C-M table is applicable
- Unique issues, categories, and measures integrate easily
- PSM guidance in this area would fill a need

Recommended Next Steps

- Continue to refine I-C-M list to address SPI-based issues, categories, and measures
- Adapt use of "basic" PSM for measuring and managing an SPI initiative
- Add new issues, categories, and measures as necessary
- Adapt existing PSM guidance for SPI
- Develop additional guidance as necessary for applying PSM to SPI

Questions or Comments?



Subgroup 2: Organizational Roll-up

- Participants
  - Greg Albert
  - Joe Boeggeman
  - Kathy Chastain
  - Bill Criss
  - Donna Thomas

Subgroup: Measurement across the organization

- Issue: Using the PSM process across all levels of the organization to identify issues and measures
  - Is the guidance sufficient?
- Issue: How to elicit issues/information needs from different levels of the organization?
- Issue: How to collect organizational measures
  - Mandate a standard set of measures (top-down)
  - Roll-up measures (bottom-up)
- Issue: Trying to compare projects that are not comparable
- Issue: Misuse of information
  - punishing
  - not listening to bad news

Subgroup: Measurement across the organization

- Obstacles
  - Lack of organizational buy-in
  - Lack of management commitment
  - Not listening to bad news
  - Lack of common processes
  - Trying to compare projects
  - Punishment
  - Projects don't understand how data will be used
  - Training

Subgroup: Measurement across the organization

- Audience
  - All levels of management
  - Other stakeholders

Subgroup 3: CMMI Measurement Process Area

- Participants
  - Dennis Ahern
  - Mal Davis
  - Jim Hudec
  - Joe Jarzombek
  - Guy Mercurio

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Restatement of Objectives

- Explore the role of measurement in Software Process Improvement
- Begin development of I-C-M table for SPI
- Develop input for Measurement and Analysis PA in CMMI

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Summary

- Very productive groups
- Good beginning by subgroups on their topics

Conclusions, Recommendations, and Results

- Guidance for measurement in SPI is needed in two forms:
  - what are the preconditions that should be met before the introduction of measurement
  - PSM approach can help to clarify what to measures to address SPI plans, activities, and results

Next Steps/Action Items

- Form a group to continue the PSM-SPI work
- For CMMI Measurement and Analysis PA, continue to solicit review and input from PSM

Measurement & SPI Workshop

- Subgroup on
- Measurement and Analysis (MA) Process Area (PA) for Capability Maturity Model Integration (CMMI)

Measurement and Analysis Process Area

RELEVANT CMMI BACKGROUND

- Capability Maturity Model Integration (CMMI).
  - CMMI Product Development Team (PDT) acknowledged potential need for Measurement and Analysis (MA) Process Area (PA).
  - Three PDT Members assigned MA PA authoring responsibilities.
- Source models and ISO standards.
  - SW-CMM V2.0, Draft C: Part of Statistical Process Management.
  - SECM V1.0: FA 2.8, Ensure Quality.
  - IPD-CMM V0.98: PA20, Quantitative Techniques (BPs: 1, 3, 4, 5, 6).
  - ISO 15504: Quality Management Process, MAN.4.
  - ISO 15504: Measurement Process, ORG.5.
  - ISO/IEC WD 15939, *IT–Software Measurement Process Framework.*

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Measurement and Analysis Process Area

WORKSHOP SUBGROUP TASK

- Review the initial draft process description from MA PA authors.
- Generate an expanded working draft for MA PA:
  - Define the Purpose.
  - List the Contents.
  - Define Goals and Specific Practices.
  - Provide Notes for clarification and outstanding issues.
  - Reference ISO Standards, and KPAs and Focus Areas in the source CMMs.

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Measurement and Analysis Process Area

PURPOSE

- Supports any process that has quantitative information needs.
  - Those information needs, and the goals and issues related to them, drive all measurement collection and analysis activities.
- Applicable within all organizational unit levels:
  - individual project.
  - organization or enterprise levels.

Measurement and Analysis Process Area

PURPOSE (cont.)

- Supports decision making, provides an objective basis for communication, and helps to manage life cycle activities.
- Ensures feasibility of plans, and adherence of activities to those plans.
- Supports the evaluation of product design, the quality of products or services, and the capability of processes.

Measurement and Analysis Process Area

CONTENT

- Establish and Maintain Measurement Capability:
  - Ensure personnel and infrastructure prerequisites for measurement are satisfied.
- Plan Measurement:
  - Develop plan to implement and evaluate data collection and analysis tasks.
- Perform Measurement:
  - Collect and analyze data, according to the measurement plan.
- Evaluate and Improve Measurement:
  - Evaluate measurement strengths and weaknesses.
  - Take action to improve the measurement process and plan.

Measurement and Analysis Process Area

GOALS

- Obtain management commitment for measurement activities.
- Establish a measurement plan to address the information needs of the organizational unit, and execute according to plan.
- Evaluate and improve the measurement process and plan.

Measurement and Analysis Process Area

SPECIFIC PRACTICES

- Establish and Maintain Measurement Capability:
  - A1. Organizational unit shall establish management commitment to support measurement and analysis.
  - A2. Organizational unit shall assure adequate resources (*e.g.*, personnel, tools) are available for performing the measurement tasks.

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Measurement and Analysis Process Area

SPECIFIC PRACTICES

- Plan Measurement:
  - B1. A measurement plan shall be produced and approved, which will:
    - B1.1 Identify a set of measures, driven by the information needs and goals of the organizational unit.
    - B1.2 Define how analysis will be conducted and used.
    - B1.3 Address how the measurement process is to be evaluated and improved, and how the plan is to be updated.

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Measurement and Analysis Process Area

SPECIFIC PRACTICES

- Perform Measurement:
  - C1. Data shall be collected in accordance with the measurement plan.
  - C2. Analysis shall be performed and results communicated to the organizational unit in accordance with the measurement plan.

Measurement and Analysis Process Area

SPECIFIC PRACTICES

- Evaluate and Improve Measurement:
  - D1. The measurement process and plan shall be evaluated, to identify strengths and weaknesses:
    - D1.1 Determine if information needs have changed.
    - D1.2 Evaluate the usefulness of current measures.
    - D1.3 Evaluate current data collection, analysis, and reporting techniques.
    - D1.4 Identify automation opportunities.
  - D2. Actions shall be taken to improve the measurement process and plan based on the evaluation results.

Measurement and Analysis Process Area

NOTES AND ISSUES

- A “common” PA.
- Consistent with PSM and emerging ISO/IEC 15939.
- All goals and practices within MA PA may be applied at any capability level; degree of sophistication varies.
- Open issues within CMMI on relation of MA PA with other proposed PAs, *e.g.*, Quantitative Process Management.
- Comments? dennis_m_ahern@mail.northgrum.com