Improving Organizational Performance through Measurement Insight

PSM Users' Group Conference
14-18 July 2008

U.S. Army Armament Research
Development and Engineering Center

PSM 2010

Objectives of the Workshop

- Review results from past workshops on "Future of Measurement"
- Review PSM Project Structure
- Agree on Scope Characteristics for PSM 2010
- Identify and Prioritize Operational Plan with actions for coming year
- Discuss changes to PSM Principles

Workshop Background

- PSM Workshops in July and December 2007

Intended Output

- Agreed Scope Characteristics
- Prioritized Operational Plan with actions for 2008/2009
- Revised principles (time allowing)

PSM Project Structure

- See Figure 1 in separate file

PSM Vision

- *(Draft 0) "To be the primary resource used by projects and organizations to implement a measurement based decision discipline that drives performance optimization and improvement"*
- *(Draft 1) "To be the primary global resource used by projects and enterprises to implement a measurement based decision discipline that drives performance*
- *AI: members to propose alternative wording*

PSM Scope Characteristics

- *PSM Tasks*
  - *Project Management*
  - *Technology Development and Integration*
  - *Development of guidance, product set*
  - *Marketing and Transition*
- *Application Scope*
  - *Project, Enterprise*
  - *Government, DoD, Industry, International, Academia*
  - *Acquirer / Supplier* c2
- *Focus Areas*
  - *Project Management - Engineering Capability & Management*
  - *Process Improvement*
  - *Performance Analysis - benchmarking, outcome*
  - *Governance* c3
  - *Interrelationships between PSM and other disciplines - e.g. Lean, Six Sigma, BSC, CMMI, other professional mgmt organizations*

Slide 8

c2 mixed set of items - need to rationalize
cheryl.jones5, 7/16/2008

c3 need to investigate to decide if should be a focus area - to what level

insersection between governance and systems/software engineering - applications, protection, what is being changed
cheryl.jones5, 7/16/2008

PSM Scope Characteristics (cont.)

- End User
  - Decision makers – project level, executive (including CIO, CEO)
- Technical Domains
  - Primary: Software-Intensive Systems
  - Secondary: flexible (with tailoring) – focused guidance
  - Potential: services, SOS, agile, service-oriented architecture, strategic planning
- Sophistication
  - Novice - Fundamental
  - Advanced
  - Focused on end-user (decision-maker)
  - Experienced users (black belts, CMMI level 4/5)
- Technical Currency
  - E.g. SLOC versus current approach

c4

PSM Initiative

- Principles
- Foundational Models - process, information, analysis, behavioral
- Key Constructs - ICM, measurement specifications, information products, impact - value added
- Key Products - guidance, training, PSM Insight, implementation aids
- Transition Strategy - marketing
- Project Management - financials, qualifications, quality, impact - value added

Slide 9

c4 think about common use today as well as up and coming technology
support the development of measures in new technical domains

services area
cheryl.jones5, 7/16/2008

Update Approach

- Update all elements for:
  - Current technology
  - Expanded/revised scope

Foundational Models

- Process model
- Information model
- Analysis model
- Behavioral model - add c5

Slide 12

c5 does behavioral model need to be separate or part of others?
cheryl.jones5, 7/16/2008

Key Constructs

- ICM table
  - Revisit basic table
  - Other ways of presenting info
  - Other specializations (e.g. agile, services, SOS)
- Measurement specifications
  - Revise template
  - Samples - simple and sophisticated
  - Samples - more examples with less level of control (reduce cycle time to produce)
- Information products
  - How to present information
- Impact – Value Added
  - How to evaluate a PSM implementation (qualitative and quantitative)
  - For each measure, show return (link to outcome)
  - Address trade-off of which measures to employ when (what gives biggest bang for the buck)

Key Products

- Guidance
  - Book / guidebook
  - Case studies
- Training
  - Update of existing materials
  - On-line training
  - Executive training
- PSM Insight
- Implementation aids
  - Explaining how to build an ICM for a different domain
  - Tailoring guidance for specification
  - Information product structure
  - Measurement process procedure

Transition Strategy

- Presentations at workshops
- Articles in magazines
- Talk to
  - leadership in various organizations (industry, government, DOD)
  - industry organizations (e.g. benchmarking consortium)
- Web site update

Project Management

- Sponsorship
  - External sponsors and PSM TWG members
- Qualifications
  - Update trainers with new technology
  - Ensure collaboration / inputs from transition organizations
- Quality
  - Transition Quality - maintain quality of trainers, understand usage and impact of PSM activities
  - Product Quality - Maintain quality through updates
- Impact - Value Added
  - How to evaluate the value of the PSM project

Measurement Principles

- Use Information Needs and Objectives to Drive the Measurement Requirements
- Define and Collect Measures Based on the Technical and Management Processes
- Collect and Analyze Data at a Level of Detail Sufficient to Identify and Isolate Problems
- Implement an Independent Analysis Capability

Measurement Principles (cont.)

- Use a Systematic Analysis Process to Trace the Measures to the Decisions
- Interpret the Measurement Results in the Context of Other Project Information
- Integrate Measurement into the Project Management Process Throughout the Life Cycle
- Use the Measurement Process as a Basis for Objective Communications
- Focus Initially on Project-Level Analysis

Next Steps

- Writing Sessions
  - Revise principles
  - Revise ICM table
  - Complete measurement specifications
  - Technology refresh of existing training materials

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Background

PSM - A Short History

- 1994 - MIL-STD-SWM
  - "let's make a list of the best metrics"
- 1995-1996 - PSM Versions 1.1 and 2.1, A Guide to Objective Program Insight
  - information driven process, objective results, experience based
- 1998 - PSM Version 3.1 - A Foundation for Objective Project Management
  - ICM constructs, measurement specifications, process model
- 1998 - PSM Insight
  - integrated tool to automate the measurement process
- 2001 - PSM Version 4.0 - A Foundation for Objective Project Management
  - software and systems engineering measurement
- 2002 - PSM, Objective Information for Decision Makers
  - information model, decision focus, ISO/IEC 15939, CMMI
- 2002-2007 - PSM Technical Extensions
  - systems engineering, specific domain guidance, performance measurement and evaluation, multi-project systemic analysis, risk management

How Has PSM Evolved?

- Software to Systems
- Project to Enterprise
- DOD to Commercial Applications
- Fundamentals to Specific Implementations
- Concepts to Models to Constructs
- Small to Extensive Number of Users
- Single Guidance Source to Multiple Sources
- Different Sponsors and Participants

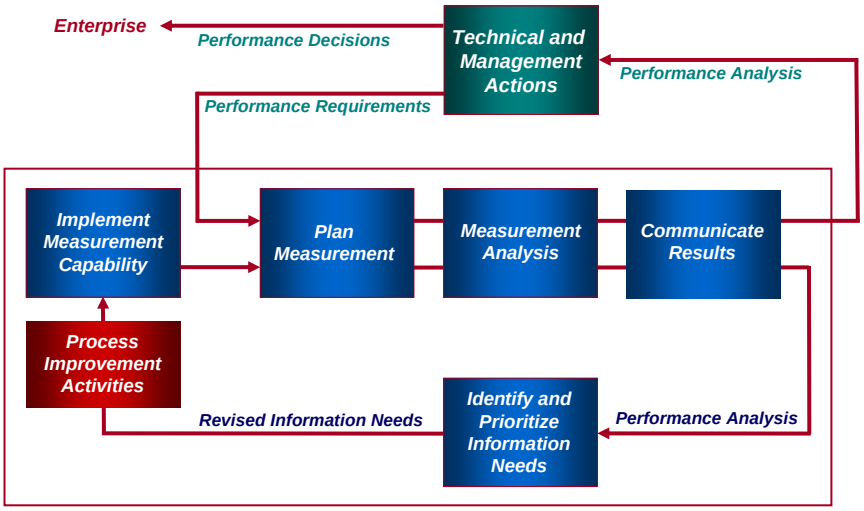
Key Questions

- What is the "best" technical guidance we can produce to help projects and organizations implement measurement effectively? (Technical)
- What do we need to do to influence greater acceptance and use of the measurement results (Acceptance)
- How do we redefine or restructure the PSM project to do this? (PSM Initiative)

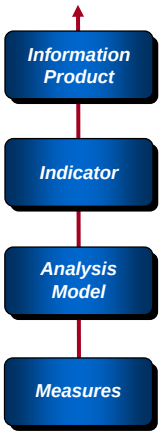
Measurement Application Challenges

- Technical Requirements - Keeping Measurement Up to Date
  - What to measure
  - How to measure
  - Analysis & estimation techniques
  - Context based understanding
  - Education
- Measurement Scope & Efficiency
  - Breadth of domain application
  - Ability to change - quickly
  - High degree of flexibility
  - Value added - cost

Measurement Process Model



Measurement Information Model



- Enterprise and project performance requirements
- Dynamic - many influences

- Primary information / decision communication construct
- Focuses on performance analysis and viable alternatives

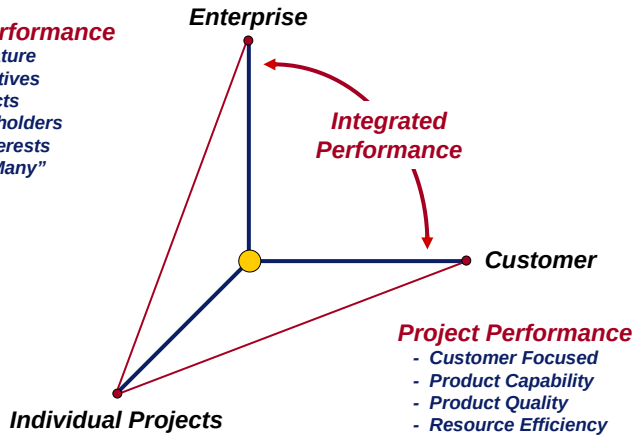
- Primary measurement construct
- Presents and clarifies measurement results

- Compares measured performance results to objective requirements
- Difficult to validly aggregate across diverse projects

- Explicitly defined and specified
- Must be feasible with respect to enterprise and project context and capability

Integrated Performance Concept

Enterprise Performance
- Strategic in Nature
- Multiple Objectives
- Multiple Projects
- Multiple Stakeholders
- Competing Interests
- "Good of the Many"



Project Performance
- Customer Focused
- Product Capability
- Product Quality
- Resource Efficiency
- Schedule Constrained
- Mission Oriented
- "Good of the Few"

Information Needs
Similar Requirements - But Unique Contexts

Enterprise

- Strategic Performance
- Enterprise Capability
- Mission Readiness
- Mission Performance
- Portfolio Management
- Reduced Cycle Times
- Resource and Financial Efficiency

Enterprise Information Needs

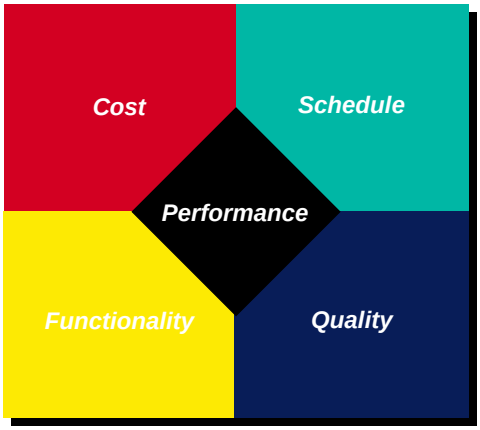
Project

- Project Team Capability
- Project Planning and Management
- Product Requirements
- Product Quality
- Estimation and Risk Assessment
- Operational Performance
- Customer Satisfaction

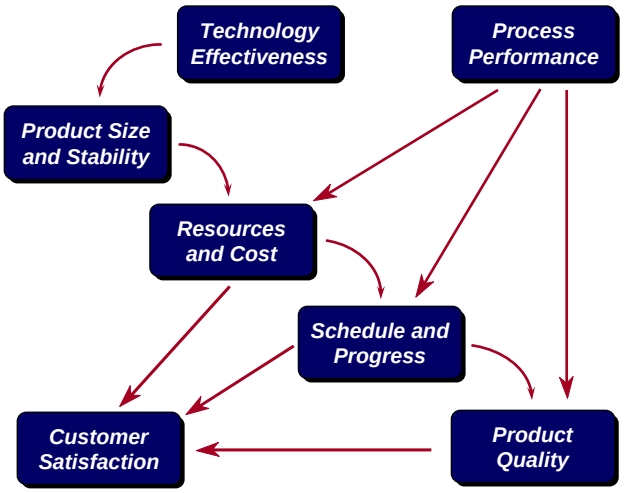
Project Team Information Needs

Aligned Information Needs

Real World Tradeoff Decisions



Integrated Analysis Model



Integrated Information Needs

Enterprise

Enterprise product portfolio performance and capability - HIGH+

Productivity improvement and resource efficiencies - process improvement - HIGH

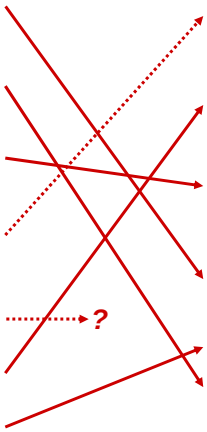
Reductions in product delivery cycles - HIGH

Project resource, product, and financial profiles - quantitative organizational characterization (people, dollars, product) - HIGH

Degree of Staff and resource resource sharing - MEDIUM

Product quality and reliability growth - MEDIUM

Enterprise risk profile - LOW



Projects

Project management and performance status information - (progress, financial management, personnel resources - HIGH+

Platform requirements and implemented product quality information - HIGH

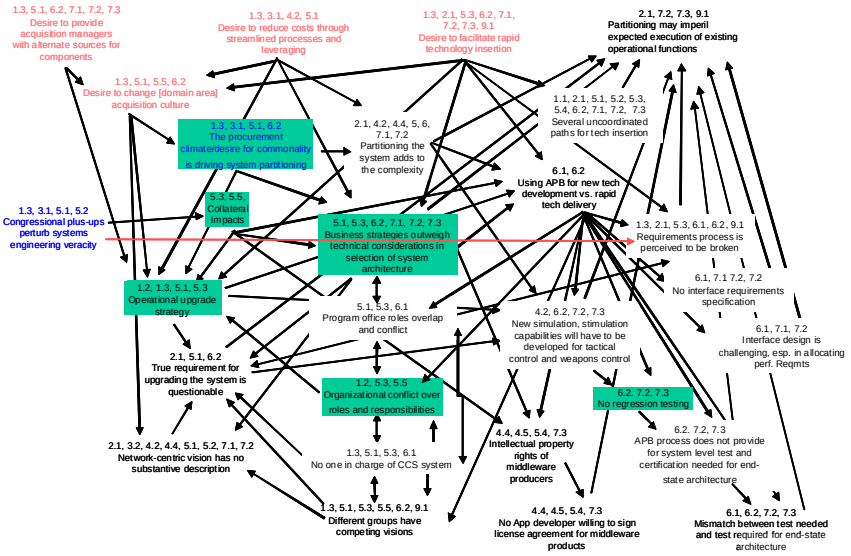
Objective work package estimation and interrupt driven task impact information - MEDIUM

Customer derived mission capability and product performance assessment information - MEDIUM

Project risk profile - LOW

Process efficiency - LOW

Complex Causes and Effects



Performance Factors

- Capable Leadership
- Superior Capabilities
- Performance Bias
- Fact-Based Decisions
- Objective Information

Superior Information

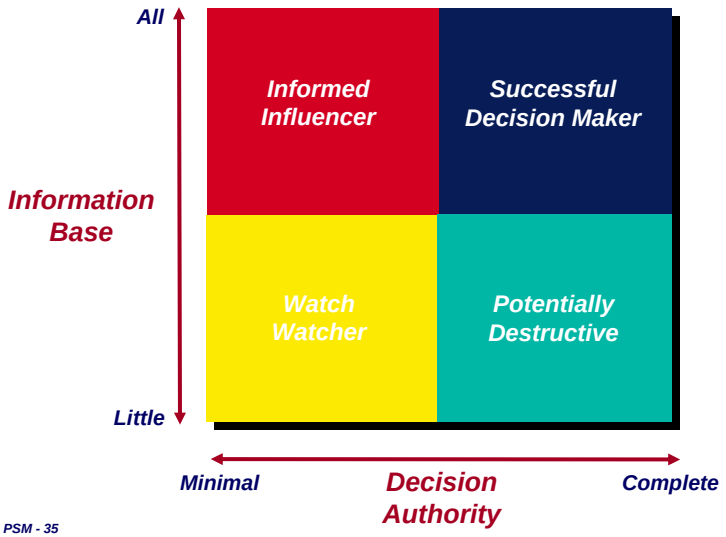
- *Explicitly defined measurable goals*
- *Objective measurement data*
- *Objective risk data*
- *Effective performance information*
- *Unfettered team communication*

- Compelling Mission Need
- Strong Constituency Support
- Feasible Objectives
- Realistic Resources & Plans

Conducive Decision Environment

- *A realistic chance of meeting defined objectives*
- *The ability to make the right, and sometimes difficult, decisions*
- *Aligned reward structure*

Decision Model



Information Infrastructure

Performance Information Needs — Enterprise Project

Objective Data + Integrated Analysis + Fact-Based Decisions + Management Actions

Measurement Application

- Capable Information Process
- Viable Measurement Constructs
- Both Measurement and Risk Data
- Performance Analysis
- Decision Alternatives
- Unfettered Communication

Decision Environment

- Decision "Freedom"
- Decision - Change Implementation
- Performance Tradeoff Decisions
- Measureable Performance Feedback
- Integrated Context - Portfolio Mgt.
- Revised Strategies and Objectives