CMMI and PMBOK Synergy

Leveraging Process Platforms for Improvement

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Objectives

Attending this presentation should enable you to:

1. Understand a little about the Project Management Institute (PMI) Project Management Body of Knowledge (PMBOK)
2. Adopt a project management approach to process improvement
3. Know the CMMI and PMBOK similarities and differences
4. Know the CMMI and PMBOK strengths and weaknesses
5. Develop an approach for combined CMMI-PMBOK implementations

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Speaking the Same Language

A “project” is:

PMBOK A temporary endeavor undertaken to create a unique product or service

CMMI A managed set of interrelated resources that delivers one or more products to a customer or end user. This set of resources as a definite beginning and end and typically operates according to a plan.

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Speaking the Same Language (cont)

The characteristics that typically define a "project" are:

- The project work is performed to fulfill some need (e.g., goals or "requirements")
- The project work can be defined or described
- The project delivers something (e.g., products or services) to someone (there is a "customer")
- Resources (usually insufficient) are allocated to the project
- The work is or can be planned
- The work can be tracked to the documented plan

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Speaking the Same Language (cont)

So, if you concur with the ideas on slides 3 and 4, then all of these things can be planned and managed as projects:

- Going to the store for groceries
- Flight testing a prototype of an advanced aircraft
- Developing and delivering a software-intensive system
- Fixing system defects for a year with a $200K budget
- Achieving CMMI Level 3
- Building a house
- Increasing organizational productivity by 1%
- Providing defined engineering services for a defined period of time

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Planning the Process Improvement Project

Consider these items in planning your process improvement project:

- The thing being developed and delivered is an integrated process "system"
- Define the business goals for what the process system is supposed to accomplish (requirements) [not a ML, which is just a measure]
- The customers of the process system are those people who will use the process system or those who will benefit from its use
- Assign a process improvement project manager and a project team (can be the SEPG but doesn't have to be)
- Define the project's deliverables and success criteria

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Planning the Process Improvement Project (cont)

Consider these items in planning your process improvement project:

- Estimate the effort, cost, and quality for designing and developing the process system based on existing data
- Look in the PMBOK for the list of the most common reasons projects fail; many of these are the same risk your process improvement project will face
- Define the process improvement project's life cycle:
  - IDEAL
  - Iterative mini-waterfalls; an elaboration of IDEAL (see next slide)

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Planning the Process Improvement Project

(Life cycle: Iterative mini-waterfalls)

For each defined improvement:

Phase 1	Characterize the current state
Phase 2	Define and baseline the process improvement requirement(s)
Phase 3	Plan the process improvement
Phase 4	Design/architect the process system or system component
Phase 5	Develop (or acquire) the process system or component
Phase 6	Test the process system or its components, and fix defects
Phase 7	Communicate, train and implement the process system or component
Phase 8	Measure and advertise success in improvements

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Managing the Process Improvement Project

Consider doing these things to manage your process improvement project:

- Integrate process improvement project reporting into the organization's mainstream methods and cycles for project reporting
- Report progress against plans (not just CMMI implementation)
- Collect and use planned measures (SPI, CPI, EV, milestone reviews) to monitor and control progress
- Use CM to ensure the integrity of the project's work products
- Use QA to objectively evaluate the process improvement project's performance to plan

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CMMI and PMBOK Similarities

Both the CMMI (primarily the PAs in the Project Management category) and the PMBOK provide good guidance for:

- Planning the project (PP, SAM, IPM)
- Executing the project (PMC, SAM, RSKM, IPM)
- Managing subcontracts (SAM, ISM)
- Managing risks (RSKM)
- Using quantitative and statistical methods for measuring and improving these processes (MA, GP3.2)

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CMMI and PMBOK Similarities (cont)

The DOD Extension to the PMBOK provides project management knowledge and practices for:

- System Engineering Management
- Software Acquisition Management (SAM, ISM)
- Logistics Management
- Test and Evaluation Management (VAL)
- Manufacturing Management

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CMMI and PMBOK Differences

The main difference between the CMMI and the PMBOK is exactly why they complement each other and work well together:

- The CMMI identifies the "**what**": the collection management and engineering practices found in successful software and system engineering orgs
- The PMBOK identifies the "**how**": generally accepted project management practices which have proven successful in many projects

The PMBOK can provide effective tools and techniques for implementing the CMMI Project Management practices.

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CMMI and PMBOK Differences (cont)

Focus

PMBOK focuses on practices for the individual PM. CMMI focuses on the project and the organization.

Maturity and Capability Levels

CMMI defines maturity and process capability levels; PMBOK does not.

Certification

PMI Certification (PMP) is bestowed on individuals. There is no individual certification for using the CMMI.

Industry Specificity

PMBOK is industry independent, but focuses exclusively on project management. CMMI focus is on software and system engineering, and covers areas beyond project management.

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CMMI and PMBOK Differences (cont)

Measurement

SCAMPI provides a method for measuring CMMI implementation. There is no defined appraisal method for measuring PMBOK implementation.

Organizational Scope

There are numerous organizational considerations for using the CMMI; “organizational unit” must be clearly defined. PMBOK practices can be used without regard to organizational scope.

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Brief Diversion on the Organizational Project Management Maturity Model (OPM3)

Although the PMBOK is focused on an individual project, OPM3 is being developed by PMI with the following vision:

> "To create a widely and enthusiastically endorsed maturity model that is recognized worldwide as the standard for developing and assessing project management capabilities within any organization."

The OPM3 kick-off was 1998 and the model is not yet finalized. Refer to www.omp3.pmi.org for more details.

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PMBOK Strengths, CMMI Weaknesses

- Because the PMBOK takes a much broader, non-industry specific approach to project management, it is more comprehensive in that area. CMMI's PM is relevant mostly to software and system engineering.
- PMBOK connects why projects should or shouldn't be started with business strategy. In the CMMI, projects simply materialize from thin air.
- The PMBOK provides practices for project closure. In the CMMI world, projects apparently never end.
- PMBOK goes into depth in project planning, monitoring, and control. CMMI coverage is broad for systems engineering, but not deep.

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PMBOK Strengths, CMMI Weaknesses (cont)

- PMBOK provides depth for risk management; CMMI's coverage is cursory.
- PMI certification of PMPs provides some level of quality assurance on the practitioners of the PMBOK. There is no quality standard for practitioners of the CMMI.

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CMMI Strengths, PMBOK Weaknesses

- CMMI integrates project management with requirements, CM, QA, verification, validation, development, and measurement; PMBOK does not.
- CMMI provides practices to ensure process institutionalization; PMBOK does not.
- Measurement in CMMI is broad based to quantitatively understand all process areas. PMBOK measures are limited to use of historic data and actual vs planned schedule / budget.
- Because the PMBOK focuses on an individual project manager's performance, it can promote the "hero syndrome" rather than improving the organization as a whole.

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CMMI Strengths, PMBOK Weaknesses (cont)

- Because CMMI is more abstract, it works with many different life cycle models. Because the PMBOK is not industry specific, it must be used in conjunction with an appropriate life cycle methodology for the industry in which it is practiced.
- CMMI provides a framework for measuring improvement at structured intervals. There is currently no easy way to measure the extent to which an organization is “PMBOKing.”
- The CMMI can be used as a way to benchmark separate organizations. The PMBOK cannot easily be used for benchmarking.

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Leveraging the Synergy

The CMMI and the PMBOK can be used together for more effective and efficient process improvement:

- Use PMBOK as “how to” guide for implementing the project management practices in the CMMI.
- Use the PMBOK’s Project Procurement Management section to complement the CMMI’s Supplier Agreement Management.
- Use PMBOK-based training and certifications to create training plans for project management staff.
- Use PMI certified PMPs to define your organization’s project management processes.

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Leveraging the Synergy (cont)

… more effective and efficient process improvement:

- Use the CMMI to “round-out” the PMBOK by integrating the management of other system engineering processes into project management.
- Use the CMMI’s Generic Practices to establish the infrastructure needed to institutionalize good project management practices.
- Use the PMBOK’s practices for project initiation and project closure to complement the CMMI’s Project Planning and Project Monitoring and Control.

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