Contrasting CMMI and the PMBOK

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Agenda

- Purpose & Overview
- Considerations for Comparison
- Similarities Between CMMI and PMBOK
- “Grey” Areas and Differences
- How PMBOK Supplements CMMI
- How CMMI Supplements PMBOK
- Conclusions
Purpose

- Contrast process requirements contained in CMMI to the process requirements in the PMBOK
Overview

- PMBOK provides additional project management processes for CMMI Organizations
- CMMI provides a process management structure and Systems and Software Engineering Best Practices
- Combining them will result in better and more complete project management of engineering projects
Considerations for Comparison
Coverage

- **CMMI**
  - Addresses Project Management of engineering endeavors
  - Addresses a larger organization composed of engineering projects

- **PMBOK**
  - Addresses Project Management without addressing the type of project or directly addressing the larger organization

- The depth of coverage varies between the documents
Intent & Structure

- PMBOK supports training Project Managers for Project Management Professional (PMP) certification.
- CMMI supports organizational process improvement for achievement of maturity and/or capability levels.
- While both have a project management focus, the structure of these documents is different.
Model Components in the Staged Representation

- Maturity Levels
  - Process Area 1
  - Process Area 2
  - Process Area n

- Specific Goals
- Generic Goals

- Specific Practices
- Generic Practices
PMBOK Components

Knowledge Area (4)
Process 5.1

Knowledge Area (5)
Process 5.2
5.2.1 Inputs
5.2.2 Tools & Techniques
5.2.3 Outputs

Knowledge Area (12)
Process 5.n

...
Similarities Between CMMI and PMBOK
Processes Addressed by Both

- Requirements Management or Scope Control
- Project Planning
- Managing and Controlling Project Execution
- Quality Assurance
- Supplier or Procurement Management
- Risk Management
- Measurement
“Grey” Areas

• The following are implied or partly addressed by PMBOK
  – Configuration Management
  – Causal Analysis
  – Generic Practices

• The following is partly addressed by CMMI
  – Human Resource Management
Definition & Context Differences

- Verification and Validation – Definitions in both documents are basically reversed
- Risk – In PMBOK, risk is an uncertainty and can be positive or negative
- Procurement Management – PMBOK considers buyer and seller points of view
- Progressive Elaboration Vs. Establish and Maintain
How PMBOK Supplements CMMI
How PMBOK Supplements CMMI

• Project Charter (or Initiation)

• More guidance and details on
  – Planning,
  – Management and Control,
  – Human Resource Management,
  – Quality Assurance,
  – Risk, and
  – Procurement

• Close Project + Accepted Deliverables
How PMBOK Supplements CMMI

• Project Charter
  – Issued by sponsor external to the project organization
  – Provides reasons for selecting a project
  – Formally authorizes existence of a project
  – Identifies and gives authority to project manager
How PMBOK Supplements CMMI

• More guidance and details on planning
  – Project Time Management (Activity Definition, Activity Sequencing, Activity Resource Estimating, Activity Duration Estimating, Schedule Development, and several possible support tools)
How PMBOK Supplements CMMI

• More guidance and details on management and control
  – Performance measurement analysis and forecasting using earned value calculations - formulas and examples are provided
  – Integrated change control details with links to the implementing sections of the PMBOK
How PMBOK Supplements CMMI

• More guidance and details on Human Resource Management
  – Human resource planning
  – Acquiring the project team
  – Developing the project team
  – Managing the project team
How PMBOK Supplements CMMI

• More guidance and details on Quality Assurance
  – Quality Planning
    • Considers Cost of Quality
    • Suggests tools with descriptions: Design of Experiments, Cost-Benefit Analysis, Benchmarking
  – Quality Control
    • Suggests tools with descriptions and some examples: cause and effect diagram, control charts, flowcharting, histogram, Pareto chart, run chart, scatter diagram, statistical sampling, defect repair review
    • Links outputs back into other processes
How PMBOK Supplements CMMI

• More guidance and details on risk
  – Risk planning and budgeting
  – Example risk parameters
  – More information on how to identify risks
  – Qualitative and quantitative risk analysis
  – Risk response planning
How PMBOK Supplements CMMI

• More guidance and details on contracting or Procurement Management
  – Considers buyer and seller
  – Request seller responses (solicitation)
  – Considerations for evaluation
  – Includes contract closure and payment
How PMBOK Supplements CMMI

• Close Project + Accepted Deliverables
  – Part of Project Management Plan
  – Administrative closure procedures
  – Contract closure procedures
  – Formal acceptance of product
How CMMI Supplements PMBOK
How CMMI Supplements PMBOK

- Engineering Best Practices
- Organizational Process Management
- Data Management
- Decision Analysis
How CMMI Supplements PMBOK

• Engineering Best Practices
  – Requirements Elicitation
  – Requirements Decomposition & Design
  – Requirements Traceability
  – Management of Interfaces
  – Planning and preparation, including environment, for Integration, Verification, and Validation
  – Product Integration
How CMMI Supplements PMBOK

- Organizational Process Management
  - Process Needs (drivers & improvements)
  - Process Asset Library
  - Process Training
  - Quantitative Quality and Process Performance Objectives
  - Process Innovation and Deployment
How CMMI Supplements PMBOK

• Data Management
  – Planning for Data Management
  – Monitoring Data Management
How CMMI Supplements PMBOK

- Decision Analysis
  - Formal Decision Analysis and Resolution with expectations on how to structure the decision process
Conclusions
Conclusions

- CMMI and the PMBOK
  - Can support each other and
  - Supplement each other
- Implementing PMBOK can help CMMI organizations support and maintain their Project Management Professionals (PMP)
- Implementing CMMI can help PMBOK based organizations with Process Management and engineering best practices
The Mappings Are Available

- Link to -
  [https://bscw.sei.cmu.edu/pub/bscw.cgi/0/79783](https://bscw.sei.cmu.edu/pub/bscw.cgi/0/79783)

- Click on “Comparisons of CMMI & Other Standards/References”

- Then click on “CMMI and PMBOK”

- There will be three files, start with “CMMI and PMBoK Mappings”
## Contact Information

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