CMMI® DEV Practices for Maturity Levels 2+3
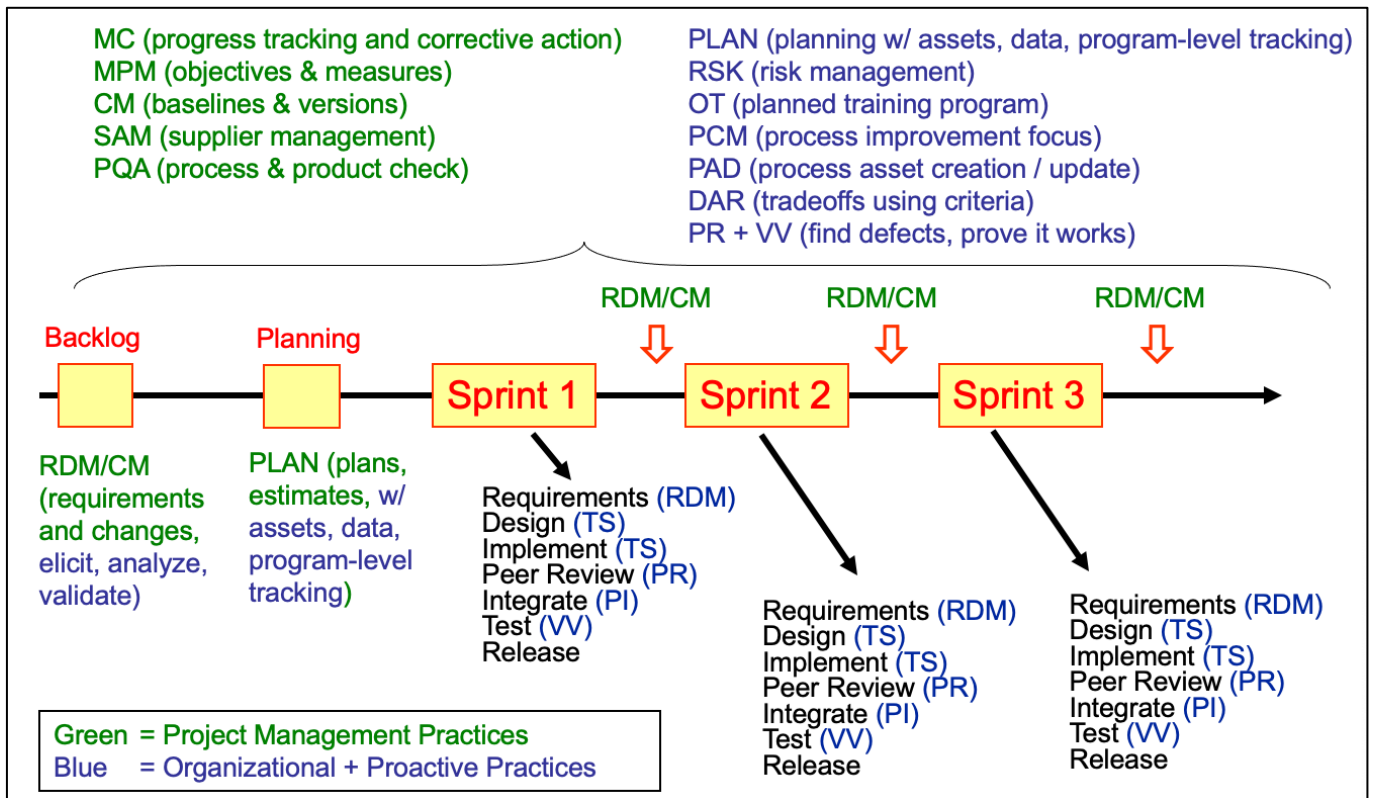
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An example grouping of the PAs based on roles and workflow

CMMI V3 Development Summary

Practice Area	Capability Level 2	Capability Level 3	Capability Level 4	Capability Level 5
Causal Analysis and Resolution (CAR)				
Decision Analysis and Resolution (DAR)				
Risk and Opportunity Management (RSK)				
Organizational Training (OT)				
Process Management (PCM)				
Process Asset Development (PAD)				
Peer Reviews (PR)				
Verification and Validation (VV)				
Technical Solution (TS)				
Product Integration (PI)				
Managing Performance & Measurement (MPM)				
Process Quality Assurance (PQA)				
Configuration Management (CM)				
Monitor and Control (MC)				
Planning (PLAN)				
Estimating (EST)				
Requirements Development & Management (RDM)				
Governance (GOV)				
Implementation Infrastructure (II)				

- Maturity Level 2 = All Practice Areas implemented with Capability Level 2 practices. ML2 = **The big blue rectangle**.
- Maturity Level 3 = All Practice Areas implemented with Capability Level 2 and 3 practices. ML3 = **The big red rectangle.**
- Maturity Level 4 = All Practice Areas implemented with Capability Level 2, 3 and 4 practices.
- Maturity Level 5 = All Practice Areas implemented with Capability Level 2, 3, 4 and 5 practices.

Practices for Maturity Levels 2+3
Maturity Level 2 = 2.x practices
Maturity Level 3 = 2.x + 3.x practices

Causal Analysis and Resolution (CAR) (core Practice Area)

CAR 2.1	Select outcomes for analysis.
CAR 2.2	Analyze and address causes of outcomes.
CAR 3.1	Determine causes of selected outcomes by following an organizational process.
CAR 3.2	Propose actions to address identified causes.
CAR 3.3	Implement selected action proposals.
CAR 3.4	Record cause analysis and resolution data.
CAR 3.5	Submit improvement proposals for changes proven to be effective.

Configuration Management (CM) (core Practice Area)

CM 2.1	Identify items to be placed under configuration management.
CM 2.2	Develop, keep updated, and use a configuration and change management system.
CM 2.3	Develop or release baselines for internal use or for delivery to the customer.
CM 2.4	Manage changes to the items under configuration management.
CM 2.5	Develop, keep updated, and use records describing items under configuration management.
CM 2.6	Perform configuration audits to maintain the integrity of configuration baselines, changes, and content of the configuration management system.

Decision Analysis and Resolution (DAR) (core Practice Area)

DAR 2.1	Develop, keep updated, and use rules to determine when to follow a recorded process for criteria-based decisions.
DAR 2.2	Develop criteria for evaluating alternatives.
DAR 2.3	Identify alternative solutions.
DAR 2.4	Select evaluation methods.
DAR 2.5	Evaluate and select solutions using criteria and methods.
DAR 3.1	Develop, keep updated, and use a description of role-based decision authority.

Estimating (EST) (core Practice Area)

EST 2.1	Develop, keep updated, and use the scope of what is being estimated.
EST 2.2	Develop and keep updated estimates for the size of the solution.
EST 2.3	Based on size estimates, develop and record effort, duration, and cost estimates and their rationale for the solution.
EST 3.1	Develop and keep updated a recorded estimation method.
EST 3.2	Use the organizational measurement repository and process assets for estimating work.

Governance (GOV) (core Practice Area)

GOV 2.1	Senior management defines, keeps updated, and communicates organizational directives for process implementation and improvement based on organization needs and objectives.
GOV 2.2	Senior management provides funding, resources, and training for developing, supporting, performing, improving, and evaluating adherence to processes.
GOV 2.3	Senior management identifies their information needs and uses the collected information to provide governance and oversight of effective process implementation and performance improvement.
GOV 2.4	Senior management holds people accountable for adhering to organization directives and achieving process implementation and improvement objectives.
GOV 3.1	Senior management ensures that measures supporting objectives throughout the organization are collected, analyzed, and used.
GOV 3.2	Senior management ensures that competencies and processes are aligned with the objectives of the organization.

Implementation Infrastructure (II) (core Practice Area)

II 2.1	Provide sufficient resources, funding, and training for developing and performing processes.
II 2.2	Develop and keep processes updated, and verify they are being followed.
II 3.1	Use organizational processes and process assets to plan, manage, and perform the work.
II 3.2	Evaluate the adherence to and effectiveness of the organizational processes.

II 3.3	Contribute process-related information or process assets to the organization.

Managing Performance and Measurement (MPM) (core Practice Area)

MPM 2.1	Derive and record measurement and performance objectives from selected business needs and objectives and keep them updated.
MPM 2.2	Develop, keep updated, and use operational definitions for measures.
MPM 2.3	Obtain specified measurement data according to the operational definitions.
MPM 2.4	Analyze performance and measurement data according to the operational definitions.
MPM 2.5	Store measurement data, measurement specifications, and analysis results according to the operational definitions.
MPM 2.6	Take actions to address identified issues with meeting measurement and performance objectives.
MPM 3.1	Develop, keep updated, and use organizational measurement and performance objectives traceable to business objectives.
MPM 3.2	Follow organizational processes and standards to develop and use operational definitions for measures and keep them updated.
MPM 3.3	Develop, keep updated, and follow a data quality process.
MPM 3.4	Develop, keep updated, and use the organization's measurement repository.
MPM 3.5	Analyze organizational performance using measurement and performance data to determine and address performance improvement needs.
MPM 3.6	Periodically communicate performance results to the organization.

Monitor and Control (MC) (core Practice Area)

MC 2.1	Track actual results against estimates for size, effort, schedule, resources, knowledge and skills, and budget.
MC 2.2	Track the involvement of identified stakeholders and commitments.
MC 2.3	Monitor the transition to operations and support.
MC 2.4	Take corrective actions when actual results differ significantly from planned results and manage to closure.
MC 3.1	Manage the project using the project plan and the project process.
MC 3.2	Manage critical dependencies and activities.
MC 3.3	Monitor the work environment to identify issues.
MC 3.4	Manage and resolve issues with affected stakeholders.

Organizational Training (OT) (core Practice Area)

OT 2.1	Identify training needs.
OT 2.2	Train personnel and keep records.
OT 3.1	Develop and keep updated the organization's strategic and short-term training needs.
OT 3.2	Coordinate training needs and delivery between the projects and the organization.
OT 3.3	Develop, keep updated, and follow organizational strategic and short-term training plans.
OT 3.4	Develop, keep updated, and use a training capability to address organizational training needs.
OT 3.5	Assess and report the effectiveness of the organization's training program.
OT 3.6	Record, keep updated, and use the set of organizational training records.

Peer Reviews (PR) (core Practice Area)

PR 2.1	Develop and keep updated procedures and supporting materials used to prepare for and perform peer reviews.
PR 2.2	Select work products to be peer reviewed.
PR 2.3	Prepare and perform peer reviews on selected work products using established procedures.
PR 2.4	Resolve issues identified in peer reviews.
PR 3.1	Analyze results and data from peer reviews.

Planning (PLAN) (core Practice Area)

PLAN 2.1	Develop and keep updated the approach for accomplishing the work.
PLAN 2.2	Plan for the knowledge and skills needed to perform the work.
PLAN 2.3	Based on recorded estimates, develop, and keep the budget and schedule updated.
PLAN 2.4	Plan the involvement of identified stakeholders.
PLAN 2.5	Plan transition to operations and support.
PLAN 2.6	Ensure plans are feasible by reconciling estimates against capacity and availability of resources.
PLAN 2.7	Develop the project plan, ensure consistency among its elements, and keep it updated.
PLAN 2.8	Review plans and obtain commitments from affected stakeholders.
PLAN 3.1	Use the organization's set of standard processes and tailoring guidelines to develop, keep updated, and follow the project process.
PLAN 3.2	Develop a plan and keep it updated, using the project process, the organization's process assets, and the measurement repository.
PLAN 3.3	Identify and negotiate critical dependencies.
PLAN 3.4	Plan for the project environment and keep it updated based on the organization's standards.

Process Asset Development (PAD) (core Practice Area)

PAD 2.1	Determine what process assets will be needed to perform the work.
PAD 2.2	Develop, buy, or reuse process assets.
PAD 2.3	Make processes and assets available.
PAD 3.1	Develop, keep updated, and follow a strategy for building and updating process assets.
PAD 3.2	Develop, record, and keep updated a process architecture that describes the structure of the organization's processes and process assets.
PAD 3.3	Develop, keep updated, and make the organization's processes and assets available for use in a process asset library.
PAD 3.4	Develop, keep updated, and use tailoring criteria and guidelines for the set of standard processes and assets.
PAD 3.5	Develop, keep updated, and make work environment standards available for use.
PAD 3.6	Develop, keep updated, and make organizational measurement and analysis standards available for use.

Process Management (PCM) (core Practice Area)

PCM 2.1	Identify improvements to the processes and process assets.
PCM 2.2	Develop, keep updated, and follow plans for implementing selected process improvements.
PCM 3.1	Develop, keep updated, and use process improvement objectives traceable to the business objectives.
PCM 3.2	Identify processes that are the largest contributors to meeting business objectives.
PCM 3.3	Explore and evaluate potential new processes, techniques, methods, and tools to identify improvement opportunities.
PCM 3.4	Provide support for implementing, deploying, and sustaining process improvements.
PCM 3.5	Deploy organizational standard processes and process assets.
PCM 3.6	Evaluate and report the effectiveness of deployed improvements in achieving process improvement objectives.

Process Quality Assurance (PQA) (core Practice Area)

PQA 2.1	Develop, keep updated, and follow a quality assurance approach and plan based on historical quality data.
PQA 2.2	Throughout the project, objectively evaluate selected performed processes and work products against the recorded process and applicable standards.
PQA 2.3	Communicate quality and non-compliance issues and ensure their resolution.
PQA 2.4	Record and use results of quality assurance activities.
PQA 3.1	Identify and record opportunities for improvement during quality assurance activities.

Product Integration (PI) (Development domain)

PI 2.1	Develop, keep updated, and follow an integration strategy.
PI 2.2	Develop, keep updated, and use the integration environment.
PI 2.3	Develop, keep updated, and follow procedures and criteria for integrating solutions and components.
PI 2.4	Confirm, prior to integration, that each component has been properly identified and operates according to its requirements and design.
PI 2.5	Evaluate integrated components to ensure conformance to the solution's requirements and design.
PI 2.6	Integrate solutions and components according to the integration strategy.
PI 3.1	Review and keep updated interface or connection descriptions for coverage, completeness, and consistency throughout the solution's life.
PI 3.2	Confirm, prior to integration, that component interfaces or connections comply with interface or connection descriptions.
PI 3.3	Evaluate integrated components for interface or connection compatibility.

Requirements Development and Management (RDM) (core Practice Area)

RDM 2.1	Elicit stakeholder needs, expectations, constraints, and interfaces or connections, and confirm understanding of requirements.
RDM 2.2	Transform stakeholder needs, expectations, constraints, and interfaces or connections into prioritized customer requirements.
RDM 2.3	Obtain commitment from project participants that they can implement the requirements.
RDM 2.4	Develop, record, and maintain bidirectional traceability among requirements and activities or work products.
RDM 2.5	Ensure that plans and activities or work products remain consistent with requirements.
RDM 3.1	Develop and keep requirements updated for the solution and its components.
RDM 3.2	Develop operational concepts and scenarios.
RDM 3.3	Allocate the requirements to be implemented.
RDM 3.4	Identify, develop, and keep updated interface or connection requirements.
RDM 3.5	Ensure that requirements are necessary and sufficient.
RDM 3.6	Balance stakeholder needs and constraints.
RDM 3.7	Validate requirements to ensure the resulting solution will perform as intended in the target environment.

Risk and Opportunity Management (RSK) (core Practice Area)

RSK 2.1	Analyze identified risks or opportunities.
RSK 2.2	Monitor identified risks or opportunities and communicate status to affected stakeholders.
RSK 3.1	Identify and use risk or opportunity categories.
RSK 3.2	Define and use parameters for risk or opportunity analysis and handling.
RSK 3.3	Develop and keep updated a risk or opportunity management strategy.
RSK 3.4	Develop and keep updated risk or opportunity management plans.
RSK 3.5	Manage risks or opportunities by implementing planned risk or opportunity management activities.

Technical Solution (TS) (Development domain)

TS 2.1	Design and build a solution to meet requirements.
TS 2.2	Evaluate the design and address identified issues.
TS 2.3	Provide guidance on use of the solution.
TS 3.1	Develop criteria for design decisions.
TS 3.2	Develop alternative solutions for selected components.
TS 3.3	Perform a build, buy, or reuse analysis.
TS 3.4	Select solutions based on design criteria.
TS 3.5	Develop, keep updated, and use information needed to implement the design.
TS 3.6	Design solution interfaces or connections using established criteria.

Verification and Validation (VV) (core Practice Area)

VV 2.1	Select components and methods for verification and validation.
VV 2.2	Develop, keep updated, and use the environment needed to support verification and validation.
VV 2.3	Develop, keep updated, and follow procedures for verification and validation.
VV 3.1	Develop, keep updated, and use criteria for verification and validation.
VV 3.2	Analyze and communicate verification and validation results.

Revision History

Version #	Date	Author	Changes Made
1	11/30/23	Neil	Created combined for all CMMI V3 practices