CMMI® for Technical Staff

SES CMMI® Training Series
April 7, 2009

Audio Conference #:
Dial - 1-877-760-2042
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Software Engineering SERVICES

Agenda

- Project Success with the CMMI
- Success Through Process
- The Generic Goals
- How Process Management Supports the Project
- The Engineering Processes
- The Support Processes
- Other Processes

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Course Objectives

Train SES developers, analysts, testers, and other project personnel to:

- *Understand the role of CMMI® in projects.*
- *Understand how institutionalization affects projects.*
- *Learn the application of engineering and support processes on projects.*
-

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→ Project Success with the CMMI

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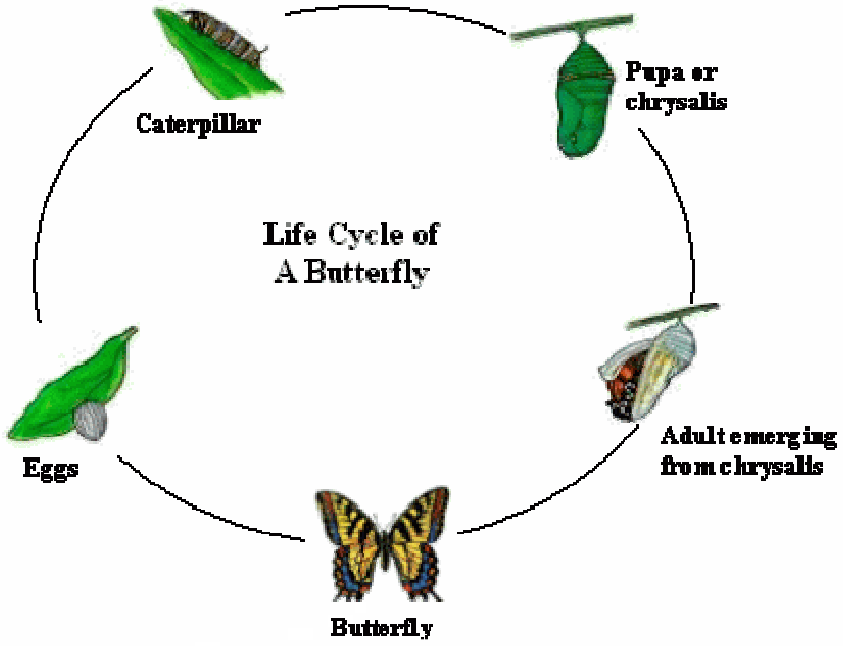
What can be Done?

- Take an incremental approach!!!
- **Preparing for Change!!!**



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Why Choose the Model?

- Flexible – Processes are defined according to business goals, product characteristics
- Modular – divided into process areas and levels
- Scaleable –the model can be used for projects of different sizes
- Comprehensive - integrates management and engineering issues
- Road Map – may use the staged model or the continuous model

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Success Through Process

Projects are more likely to succeed with standardized processes and documentation in place

- Much more common now for projects to integrate components from multiple sources, develop final product or service
- Processes weave together the people, procedures, and tools
- Best practice processes perform the weaving more effectively and efficiently

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The Criticality of Tailoring

- Tailoring is a key activity to demonstrate standardization of process within SES projects (both internal and external)
- Tailoring has as its starting point the SES set of standard processes (the organizational set of standard processes (OSSP))
- Project processes derive from the OSSP instead of ad-hoc, client-based, or other sources
- Tailoring done properly should not interfere with meeting client process requirements and artifact production requirements

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Success Through Process

Capability Maturity Model Integration (CMMI) Version 1.2 Process Areas (PA)

LEVEL 2	Requirements Management	REQM
	Project Planning	PP
	Project Monitoring and Control	PMC
	Supplier Agreement Management	SAM
	Measurement and Analysis	MA
	Process and Product Quality Assurance	PPQA
	Configuration Management	CM
LEVEL 3	Requirements Development	RD
	Technical Solution	TS
	Product Integration	PI
	Verification	VER
	Validation	VAL
	Organizational Process Focus	OPF
	Organizational Process Definition +IPPD	OPD
	Organizational Training	OT
	Integrated Project Management +IPPD	IPM
	Risk Management	RSKM
	Decision Analysis and Resolution	DAR

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The Generic Goals on Projects

- ‘Generic’ means the goal applies to more than one process area
- Generic goals describe how an organization institutionalizes each process area
- Therefore our projects must achieve each of the generic goals for every process area

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The Generic Goals on Projects

- GG2: Institutionalize a managed process
  - GP 2.1: Establish and maintain organizational policy
  - GP 2.2: Establish and maintain the plan to perform the process
  - GP 2.3: Provide adequate resources
  - GP 2.4: Assign responsibility
  - GP 2.5: Train people
  - GP 2.6: Manage configurations
  - GP 2.7: Identify and involve stakeholders
  - GP 2.8: Monitor and control the process
  - GP 2.9: Objectively evaluate adherence
  - GP 2.10: Review status with higher management

Those in blue font relate directly to project staff.

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The Generic Goals on Projects

- GG3: Institutionalize a defined process
  - GP 3.1: Establish a defined process
  - GP 3.2: Collect improvement information

Those in blue font relate directly to project staff.

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The Generic Goals on Projects

Generic Goal	Typical SES Artifact
GP 2.1: Establish and maintain organizational policy	SES policy
GP 2.2: Establish and maintain the plan to perform	PP w/revisions, schedule
GP 2.3: Provide adequate resources	PP w/revisions, schedule, org chart
GP 2.4: Assign responsibility	PP w/revisions, schedule, org chart
GP 2.5: Train people	Training plan or PP
GP 2.6: Manage configurations	Data Mgmt. Plan or PP, CM plan
GP 2.7: Identify and involve stakeholders	PP signoff, Mgmt reviews, meetings w/relevant stakeholders
GP 2.8: Monitor and control the process	Detailed proj. status report, MDS, milestone / mgmt. meetings
GP 2.9: Objectively evaluate adherence	QA report, QA audit, AI/CAR log
GP 2.10: Review status with higher management	PM & QA reports, milestone & mgmt reviews, demos

PP = project plan
MDS = metric definition spreadsheet
AI/CAR = Action Item/Corrective Action Request

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The Generic Goals on Projects

Generic Goal	Typical SES Artifact
GP 3.1: Establish a defined process	Std Processes and Tailoring worksheet
GP 3.2: Collect improvement information	Proj. closure report, lessons learned, MDS or other measurements in SES repository

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How Process Management Supports the Project

- EMO sets policy, directs process management activities
- PMG maintains process management processes
- Process management process areas (OPF, OPD, OT) maintained by PMG
- Process management processes help projects by:
  - Training project staff in the CMMI®
  - Identifying strengths & weaknesses in process implementation (assessment, audit)
  - Maintaining and improving the set of standard SES processes
  - Assist projects in deploying SES processes including tailoring
  - Assist projects in updating and maintaining SES processes throughout the project life cycle

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The Engineering Processes

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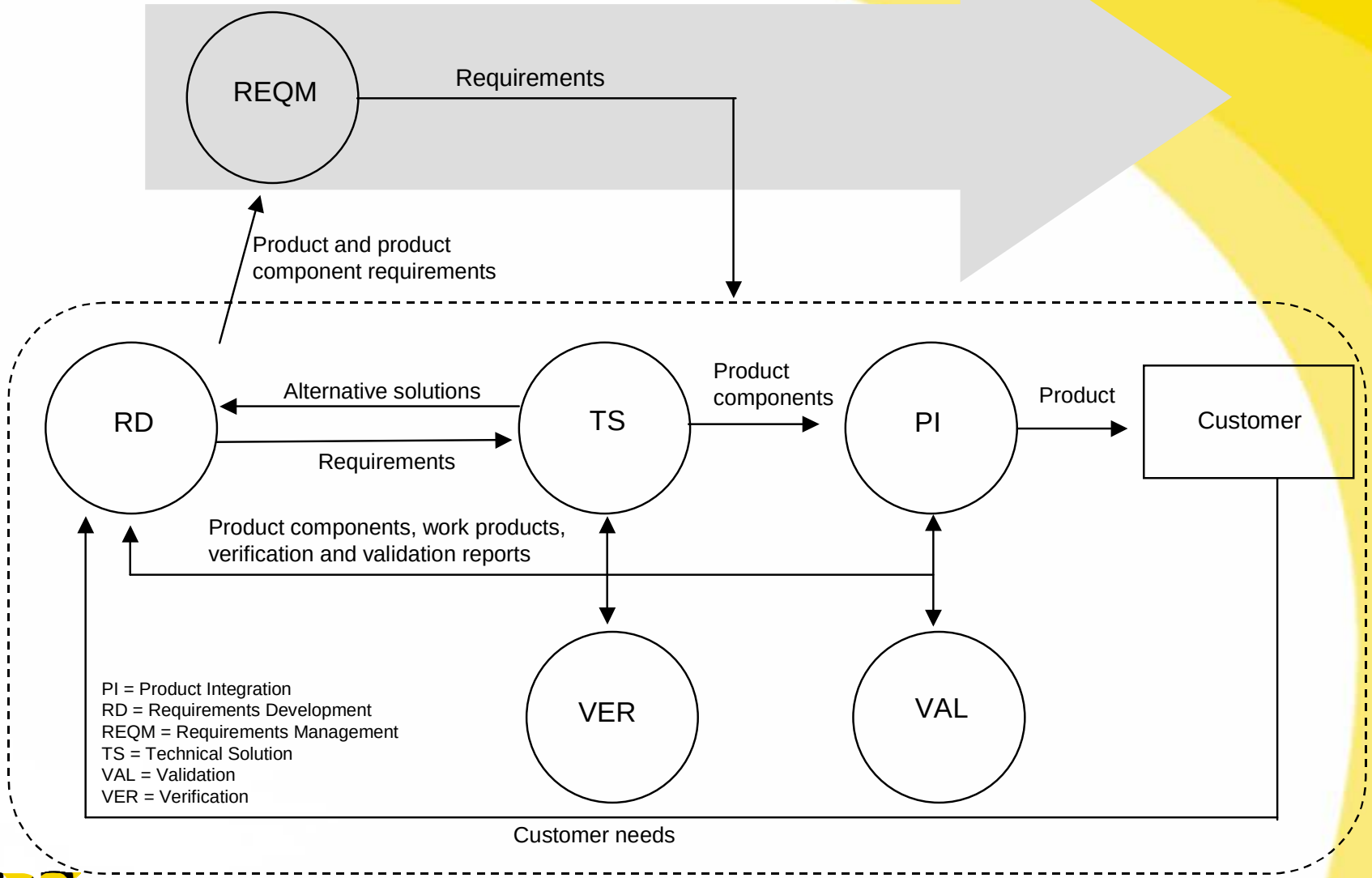
The Engineering Process Areas



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Requirements Management

- Plays critical role in project management, though it comes from the Engineering process group.
- CMMI V1.3 will add REQM to the Project Management process group.

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Requirements Management

Purpose: ***Manage the requirements of the project's products and product components and to identify inconsistencies between those requirements and the project's plans and work products.***

Goal	Activities	Artifacts
Manage requirements	Understand Requirements. Obtain Commitment to Reqmts. Manage Requirements Changes. Maintain Traceability. Identify Inconsistencies Between Work Products and Requirements.	Product Reqmt Specification Signoff. Demo / Walkthrough minutes, Kickoff attendees & minutes, Reqmts Peer Review Form / Results. Reqmt Change Form. Traceability Matrix w/Revision History.

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Requirements Development

Purpose: ***Produce and analyze customer, product, and product component requirements.***

Goal	Activities	Artifacts
Develop Customer Requirements	Elicit Needs. Develop the Customer Requirements.	SOW, Customer Requirements, Reqmts meeting/JAD minutes, Requirements Document
Develop Product Requirements	Establish Prod & Prod Comp. Reqmts. Allocate Prod Component Reqmts. Identify Interface Requirements.	Requirements Document, Interface Control Requirements Document, High-Level Design Document
Analyze and Validate Requirements	Establish Op Concepts & Scenarios. Establish Definition of Required Functionality. Analyze Requirements. Analyze Reqmts to Achieve Balance. Validate Requirements.	Ops Concept Document, Use Cases, Requirements Document, Design Document, Quality/Peer Review Results, Prototypes, Walkthrough with Users

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Technical Solution

Purpose: ***Design, develop, and implement solutions to requirements..***

Goal	Activities	Artifacts
Select Component Solutions	Develop Alternative Solutions. Develop Selection Criteria. Select Solutions.	Design Specification or Tech Solution Evaluation Selection Form
Develop the Design	Design Components. Establish a Technical Data Package. Design Interfaces. Perform Make/Buy/Reuse Analysis.	Design Spec, Interface Design Worksheet, Tech Solution Evaluation Selection Form, Req't Definition Doc., Req't Spec, Make /Buy Worksheet or Analysis
Implement Product Design	Implement Design. Develop Support Documentation.	Product Components e.g. Source Code, Databases, User Training Materials, User/Operator/ Maintenance/ Installation Manuals

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Product Integration

Purpose: ***Assemble product from components; ensure it functions properly; and deliver the product.***

Goal	Activities	Artifacts
Prepare for Integration	Determine Integration Sequence. Establish Integration Environment, Procedures, and Criteria	Integration Sequence Worksheet, Integration Procedures Form
Ensure Interface Compatibility	Review Completeness of Interface Descriptions. Manage the Interface Definition/ Design/Changes.	Interface Mgmt Doc, Interface Design Worksheet
Assemble the Product and Deliver Components	Ensure Component And Interface Readiness. Assemble Components. Evaluate Component Interface Compatibility. Package and Deliver Product to Customer.	Acceptance Form, Acceptance Signoff, Directory of Stored Components, Interface Mgmt Doc, QA Test Audit, Issue Log, V&V Report, Signoff Form

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Verification

Purpose: ***Ensure work products meet the specified requirements.***

Goal	Activities	Artifacts
Prepare to Verify	Select Product to Verify. Establish Verification Environment. Establish Verification Procedures and Criteria.	V&V Plan, Test Plan
Perform Peer Review	Prepare and Conduct Peer Reviews. Analyze Peer Review Data (Defects, Needed Changes).	Completed Peer Review Checklists, QA Plan and Reports
Verify Work Products	Perform Verification. Analyze Results of Verification.	Completed Peer Review Checklists, V&V Report, Test Report

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Validation

Purpose: ***Demonstrate product or product components fulfill intended use when placed in the intended environment.***

Goal	Activities	Artifacts
Prepare for Validation	Select Validation Products. Prepare Validation Environment. Establish Validation Procedures and Criteria.	V&V Procedures and Plan, Test Plan and Scripts/Procedures
Validate Product	Perform Validation. Analyze Validation Results.	V&V Report, Test Report

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The Support Processes

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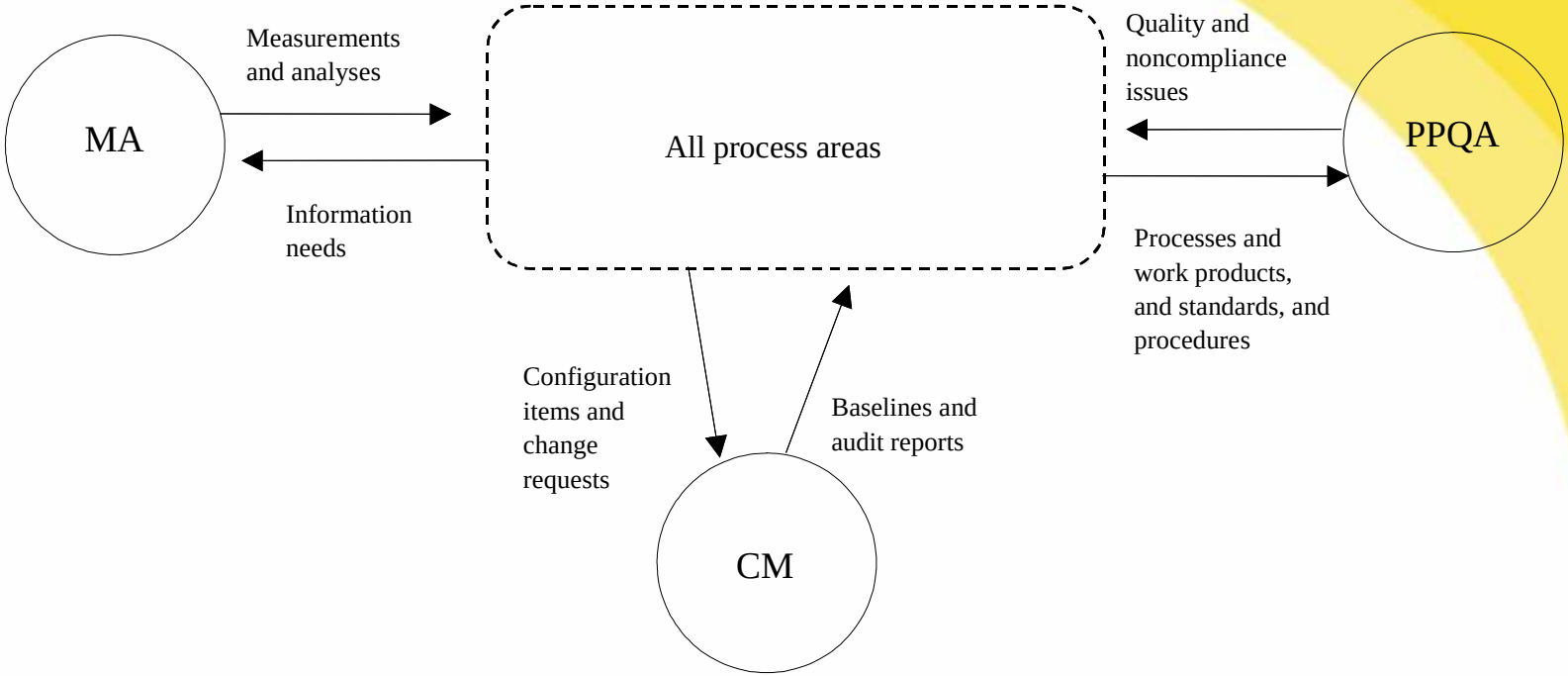
Basic Support Process Areas



MA = Measurement and Analysis
CM = Configuration Management
PPQA = Process and Product Quality Assurance

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Measurement and Analysis

Purpose: ***Develop and sustain a measurement capability that is used to support management information needs.***

Goal	Activities	Artifacts
Align M&A Activities	Establish Objectives. Specify Measures. Specify Data Collection And Storage Procedures. Specify Analysis Procedures.	SES Metric Plan; Possibly in PP also. MDS.
Provide Measurement Results	Collect, Analyze, And Store Data. Store Results Of Data Analysis. Communicate Analysis Results.	PM & QA Reports (can attach MDS) stored in Doc. Locator.

PP = Project Plan
M&A = Measurement and Analysis
MDS = Metric Definition Spreadsheet

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Process and Product Quality Assurance

Purpose: ***Provide staff and management with objective insight into processes and associated work products.***

Goal	Activities	Artifacts
Objectively Evaluate Processes and Work Products	Evaluate Work Product, Services, and Processes.	QA Audit Checklists (suite) QA Audit Reports
Provide Objective Insight	Communicate Non-compliance. Ensure Non-compliance Issues are Resolved. Establish QA Records.	QA Audit Checklists (suite). CAR Log / Defect Log. Audit Schedule.

QA = Quality Assurance.
CAR = Corrective Action Request

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Configuration Management

Purpose: ***Establish and maintain the integrity of work products using configuration identification, configuration control, configuration status accounting, and configuration audits.***

Goal	Activities	Artifacts
Establish Baselines.	Identify Configuration Items. Establish a CM System. Release Baselines.	CM Plan (or CM Section in PP). Project's Populated Doc. Locator Directory. Diagram of Environments (Dev., Test, Prod., Etc.).
Track and Control Changes.	Track Change Requests. Control Configuration Items.	Key Project Documents' PM and Client Signoff and Change History; Document Versions.
Establish Integrity	Establish CM Records. Perform Configuration Audits.	Key Project Documents' PM and Client Signoff and Change History; Document Versions. CM Baseline Audit Report. Functional and Physical Audit Reports.

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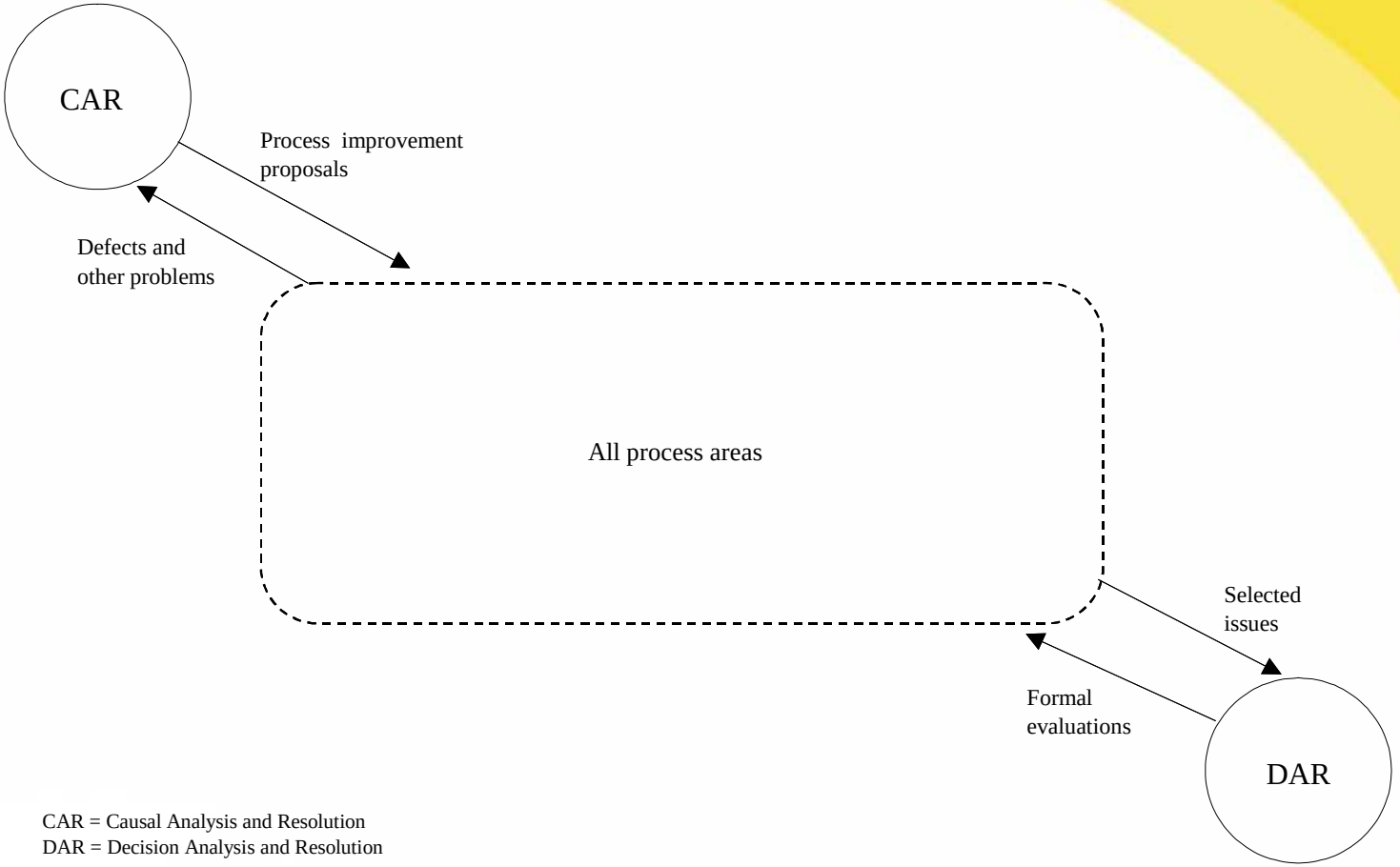
PP = Project Plan
CM = Configuration Management

Advanced Support Process Areas



CAR = Causal Analysis and Resolution
DAR = Decision Analysis and Resolution

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Decision Analysis and Resolution

Purpose: ***To analyze possible decisions using a formal evaluation process that evaluates identified alternatives against established criteria.***

Goal	Activities	Artifacts
Evaluate Alternatives	Establish Guidelines for Decision Analysis. Establish Evaluation Criteria. Identify Alternative Solutions. Select Evaluation Methods. Evaluate Alternatives. Select Solutions.	DAR Process and DAR Report.

For Example: DAR can be used to satisfy TS SG 1 (Select Product Component Solutions) and the Perform Make, Buy, or Reuse Analyses practice under TS SG2 (Develop the Design).

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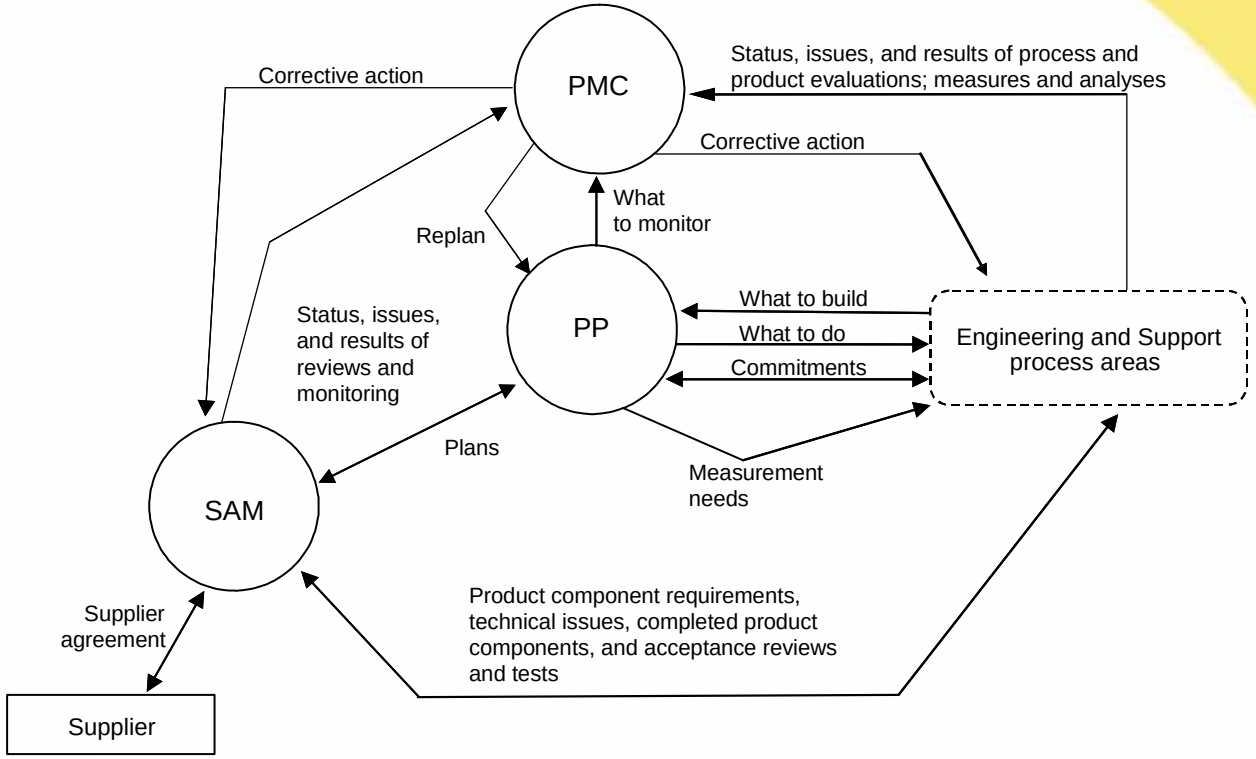
Basic Project Management Process Areas



PMC = Project Monitoring and Control
PP = Project Planning
SAM = Supplier Agreement Management

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Project Planning

Purpose:

To establish and maintain plans that define project activities.

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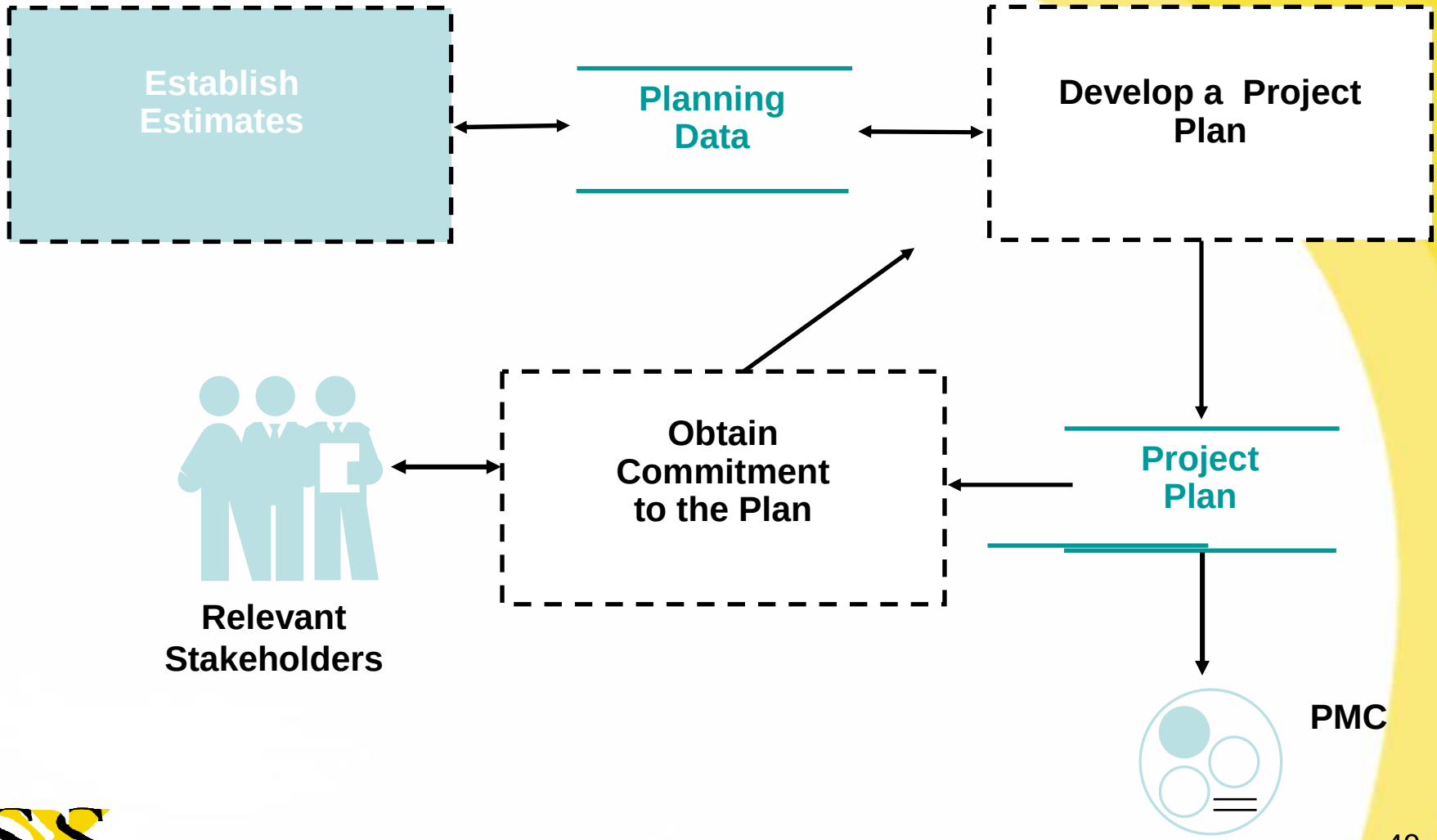
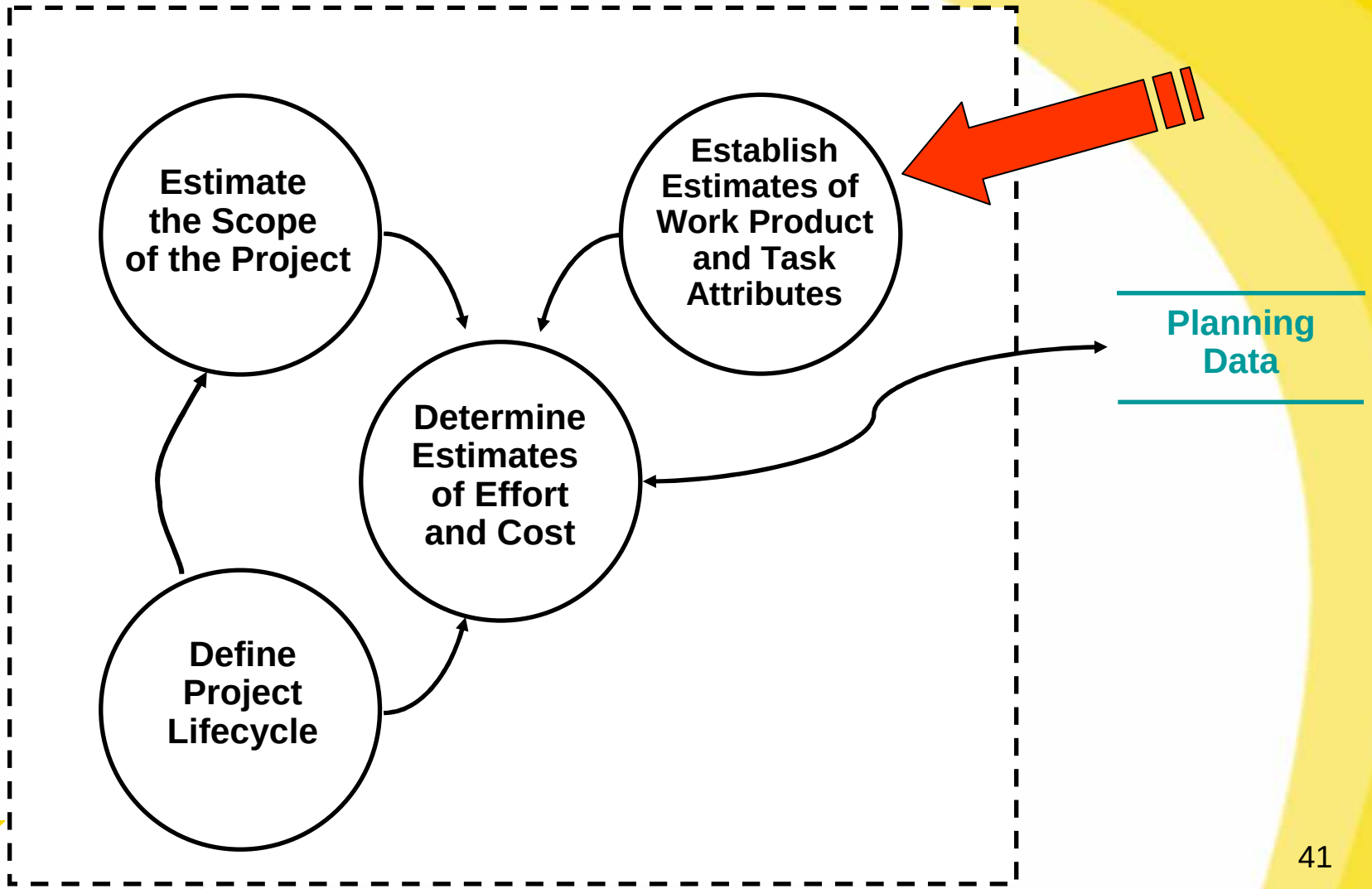
Project Planning



Project Planning

Artifacts: SOW, WBS, Estimating Worksheets, SDLC/PDLC Document



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Project Monitoring and Control

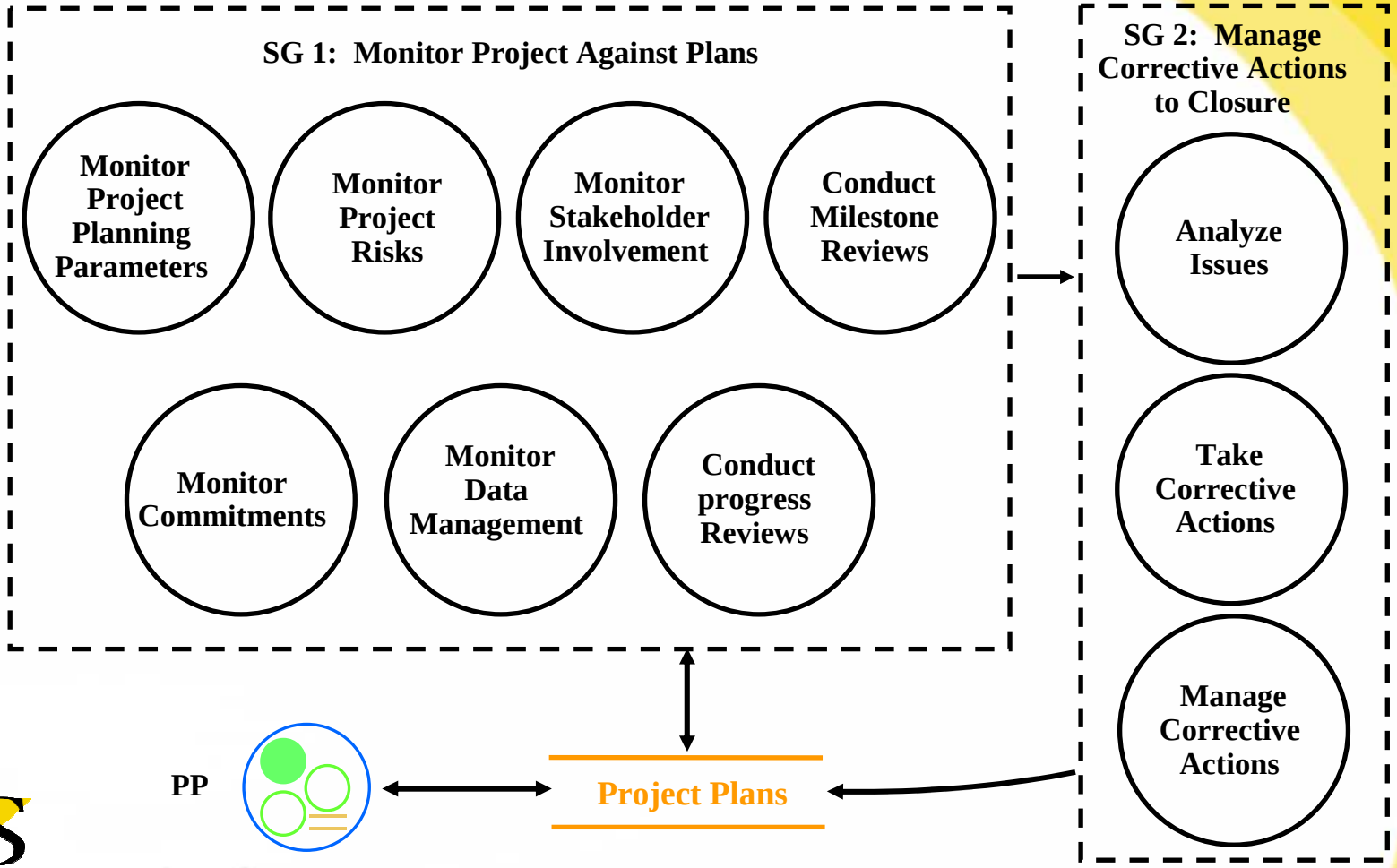
Purpose:

Provide understanding into the project's progress so that appropriate corrective actions can be taken when the project's performance deviates significantly from the plan.

Project Monitoring and Control - Context

Artifacts: QA audit reports, PM/QA/CM status reports, Risk report & register, Mgmt. Reviews.

Artifacts: Mgmt. Reviews / minutes / attendance, PM status report, action item and issues logs, revised PP w/signoff.



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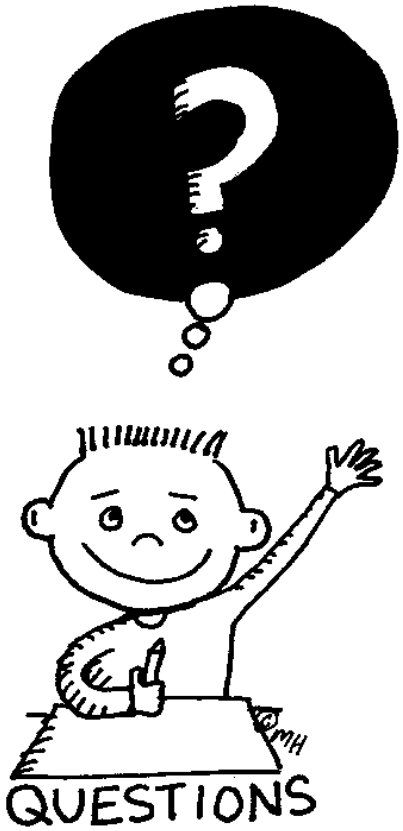
Q & A?



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Further Info

CMMI Homepage

https://teammember.sessolutions.com/sescmmi.aspx

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- Jim Moudry- jmoudry@sesc-us.com

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