

МУК 2016/2017:

Модели за управление на качеството.
[Курс на базата на CMMI]

Software Quality Models
[CMMI based course]

Project Monitoring and Control (PMC)

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Информация, източници:

www.esicenter.bg >> general info and in "Resources"

links to CMMI models

<http://cmmiinstitute.com/cmmi-solutions/>

<http://www.sei.cmu.edu/cmmi/tools/index.cfm>

CMMI –DEV v 1.3 model (CMMI Institute, and SEI, Carnegie Mellon University)

<http://cmmiinstitute.com/resource/cmmi-for-development-version-1-3/>

www.sei.cmu.edu/reports/10tr033.pdf

General

www.sei.cmu.edu

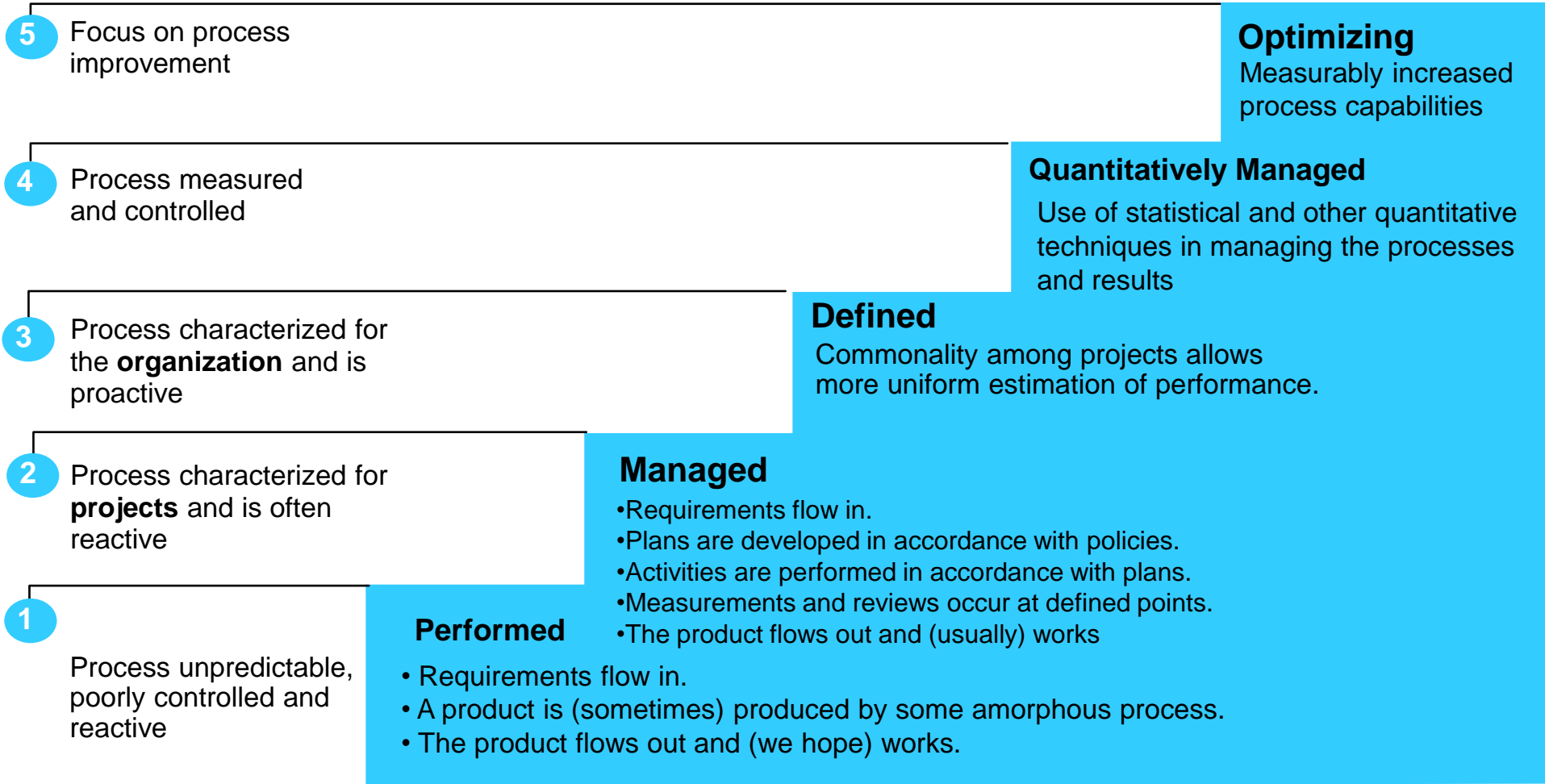
www.cmmiinstitute.com

Къде сме?

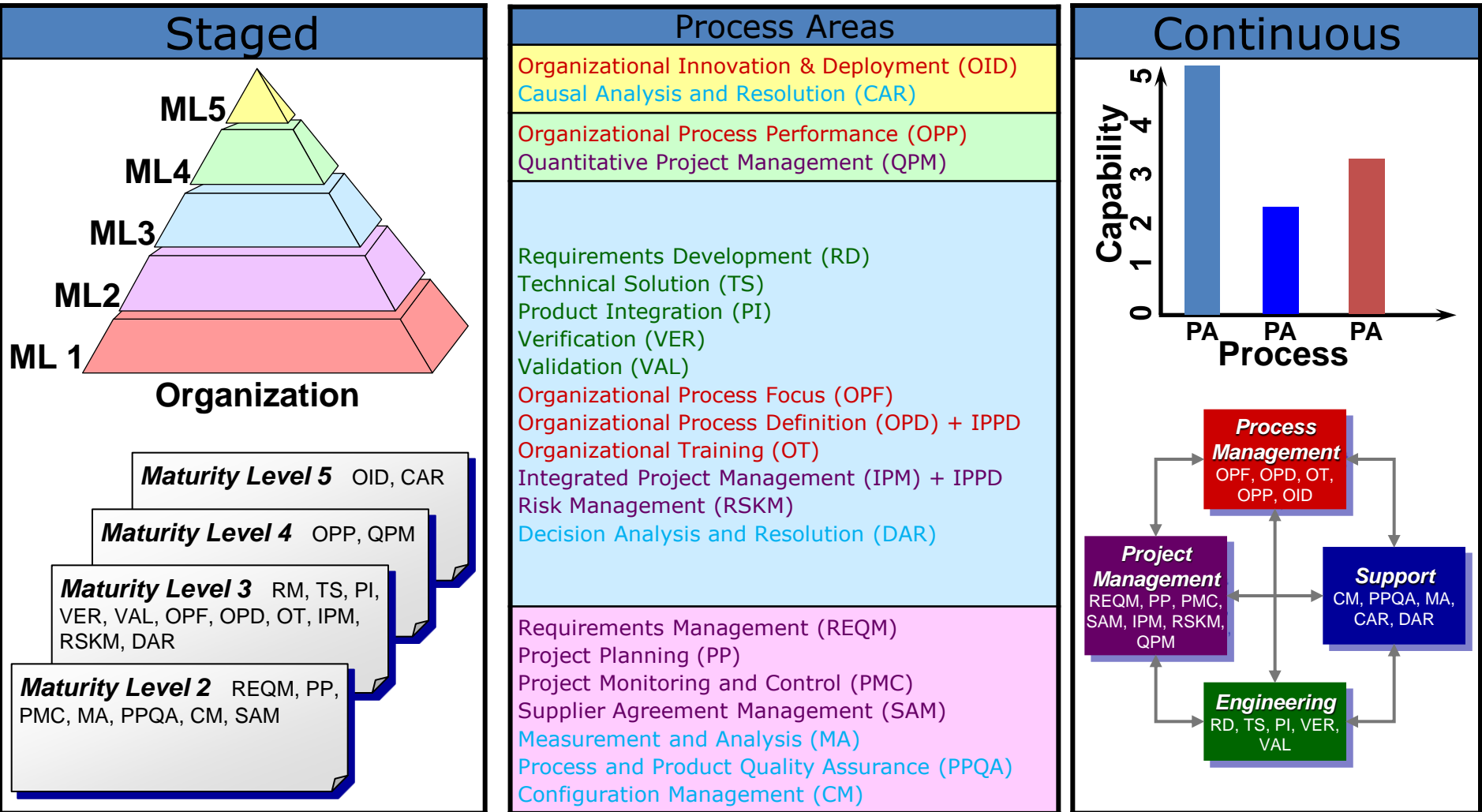
1	Увод в управление на качеството. Компоненти и цена на качеството. Процеси. Преглед на моделите за управление на качеството и подобряване на процесите. Методи за оценка на зрелостта на ИТ-интензивни и софтуерни организации. Стратегически карти/Балансирана система от показатели (balanced ScoreCards).
2	Модел CMMI (ver 1.3). История, внедряващи организации. Обща структура. Процесни области. Генерични и специфични цели и практики. Презентации – Maturity/Capability нива на Continuous и Staged representations. Категории процесни области: Process Management, Project Management, Engineering, Support.
3	Процесни области от ниво 2 на CMMI. Детайлно представяне на: REQM – Requirements Management PP – Project Planning MA – Measurement and Analysis PPQA – Process and Product Quality Assurance CM – Configuration Management PMC – Project Monitoring and Control Преглед на: SAM-Supplier Agreement Management
4	Процесни области от ниво 3 на CMMI. Детайлно представяне на: RD – Requirements Development VAL - Validation VER - Verification RSKM - Risk Management TS - Technical Solution Преглед на: DAR - Decision Analysis and Resolution , IPM - Integrated Project Management , OPD - Organizational Process Definition , OPF - Organizational Process Focus, OT - Organizational Training , PI - Product Integration Преглед на Maturity Level 4 и 5. Обобщение на връзките между процесните области: Tying all together
5	Внедряване на програма за подобряване на процесите на база CMMI. Адаптирани подходи – Agile CMMI, CMMI/ISO. Нови модели CMMI – CMMI for Services, CMMI for Acquisition. Оценка (SCAMPI), роли.
6	Подобряване на процесите в малки фирми – IT Mark. Компоненти на зрелостта – бизнес, организация/процеси, информационна сигурност. Оценка на нивото и план за подобрения.

CMMI (SEI/CMU) – reference model or **de facto** industrial standard

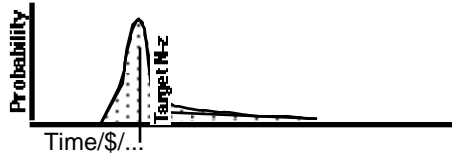
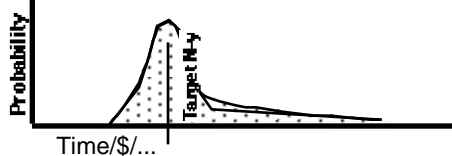
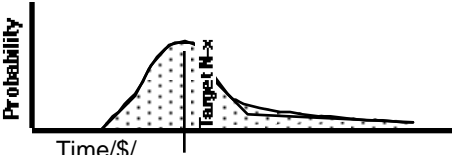
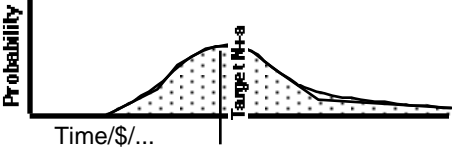
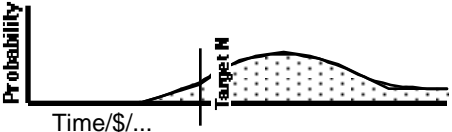
CMMI-DEV, CMMI-ACQ, CMMI-SVC



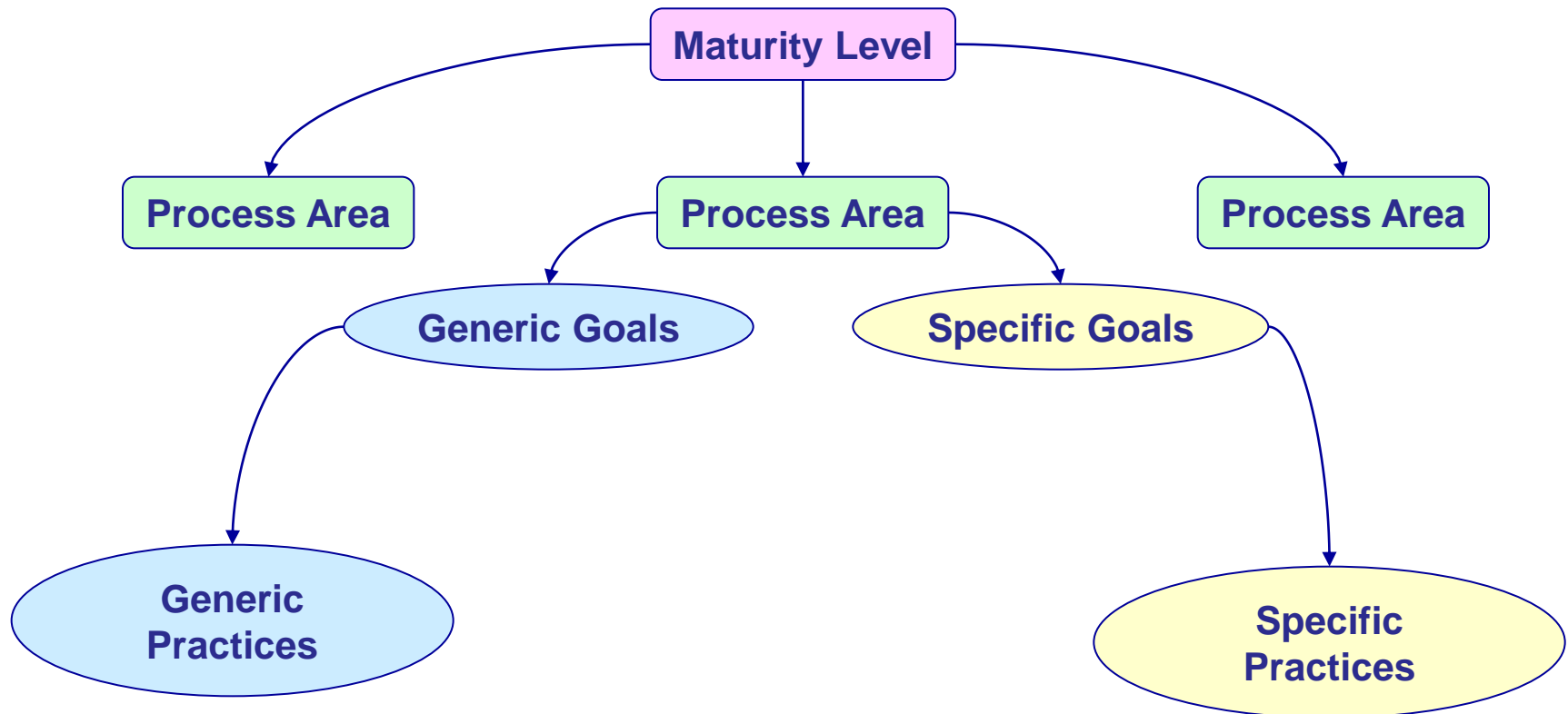
Remember: CMMI Representations



Remember: Evolution of Process Capability

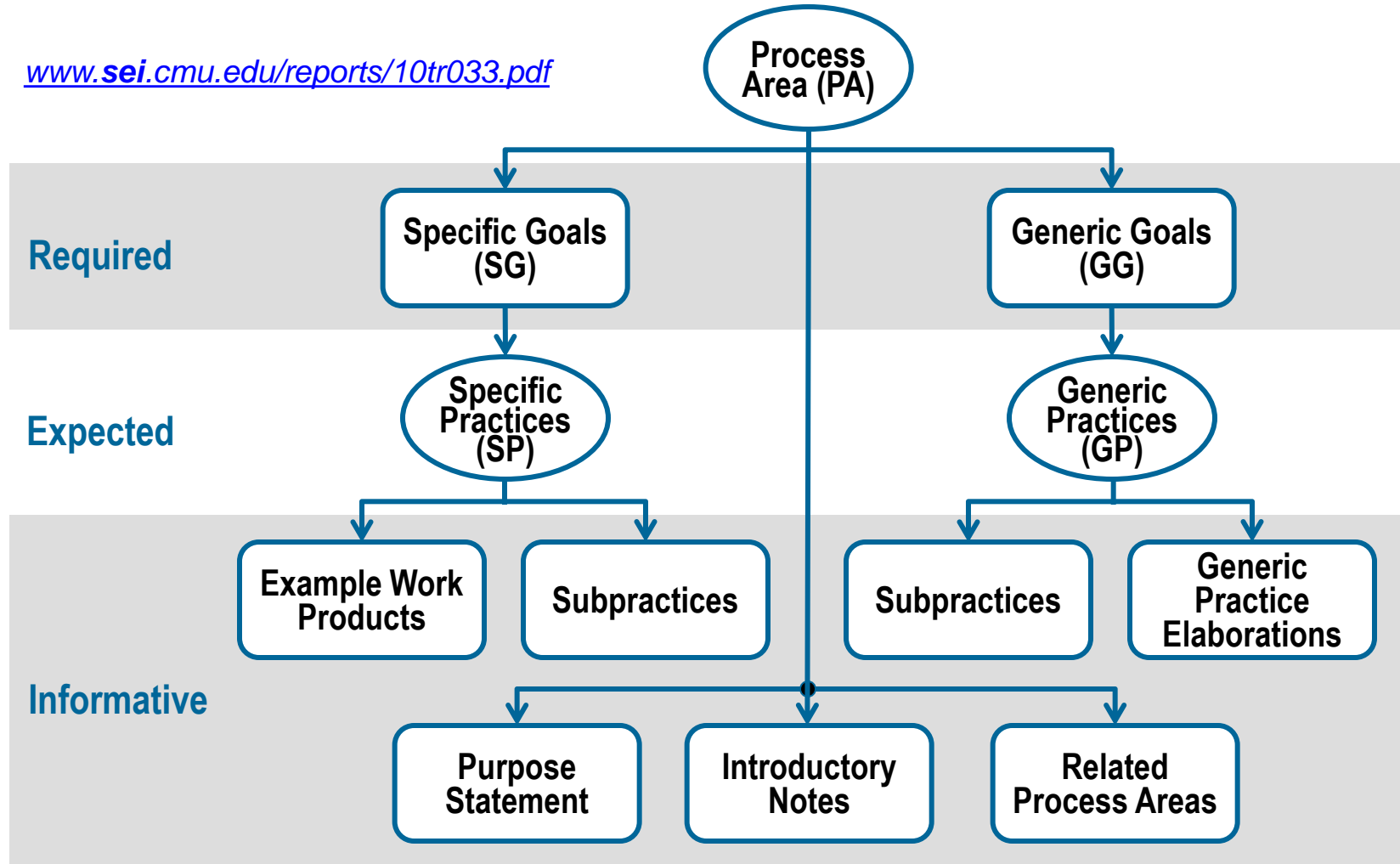
Level	Process Characteristics	Predicted Performance
5 Optimising	Process improvement is institutionalised	
4 Quantitatively Managed	Product and process are quantitatively controlled	
3 Defined	Software engineering and management processes are defined and integrated	
2 Managed	Project management system is in place; performance is repeatable	
1 Initial	Process is informal and unpredictable	

Structure of the CMMI Staged Representation



What's in the model & book: Process Area Components

www.sei.cmu.edu/reports/10tr033.pdf



Remember:

Maturity Levels Cannot Be Skipped

A level provides a necessary foundation for effective implementation of processes at the next level.

- Higher level processes are easily sacrificed without the discipline provided by lower levels.
- The effect of innovation is obscured in a noisy process.

Higher maturity level processes may be performed by organisations at lower maturity levels, with risk of not being consistently applied in a crisis.

Maturity Levels & GPs

Maturity Level 2

- Requirements management
- Project planning
- Project monitoring and control
- Supplier agreement management
- Measurement and analysis
- Process and product quality assurance
- Configuration management

- GP 2.1 Establish organizational policy
- GP 2.2 Plan the process
- GP 2.3 Provide resources
- GP 2.4 Assign responsibility
- GP 2.5 Train people
- GP 2.6 **Control Work Products** (Manage configuration)
- GP 2.7 Identify and involve relevant stakeholders
- GP 2.8 Monitor and control the process
- GP 2.9 Objectively evaluate adherence
- GP 2.10 Review status with higher level management

Maturity Level 3




- Requirements development
- Technical solution
- Product integration
- Verification
- Validation
- Organizational process focus
- Organizational process definition + IPPD
- Organizational training
- Integrated project management + IPPD
- Risk management
- Decision analysis and resolution

GP 3.1 Establish a defined process

GP 3.2 Collect improvement information

About Generic Goals and Institutionalization

The degree of institutionalization is embodied in the generic goals and expressed in the names of the processes associated with each goal as indicated below.

Generic Goal and Title		Progression of Processes
 GG 3	Institutionalize a Defined Process	Defined Process
 GG 2	Institutionalize a Managed Process	Managed Process
 GG 1	Achieve Specific Goals*	Performed Process

* This generic goal is only used in the continuous representation.

ML2: **Управлението на проектите** **включва**

Разбиране и спазване на **изискванията**

Оценка на работа, която трябва да се извърши

Разработване на **механизми, които спомогнат за**
идентифициране на продуктите

Разработване на **план на проекта**

Предприемане на стъпки за **спазване на плана**

Работа с **доставчиците, за да установим** идентифицираните
продукти

Мониторинг на прогреса спрямо плана

Определяне и анализ на **риска**

Предприемане на действия за справяне със **значителни**
отклонения от плана

Предприемане на адекватни действия за
намаляване на риска

ML2 GG&GPs

GG2: Institutionalize a Managed Process

What should be applied to all PAs (from ML2 and up):

GP2.1: Establish an Organizational Policy

GP2.2: Plan the Process

GP2.3: Provide Resources

GP2.4: Assign Responsibility

GP2.5: Train People

GP2.6: Control Work Products

GP2.7: Identify and Involve Relevant Stakeholders

GP2.8: Monitor and Control the Process

GP2.9: Objectively Evaluate Adherence

GP2.10: Review Status with Higher Level Management

Project Management PAs (overview)

Requirements management (REQM)

- SG1: Manage requirements

Project Planning (PP)

- SG1: Establish Estimates
- SG2: Develop a project plan
- SG3: Obtain Commitment to the plan

Project Monitoring and Control (PMC)

- **SG1: Monitor Project Against Plan**
- **SG2: Manage Corrective action to closure**

PMC: Project Monitoring and Control

Целта на наблюдението и контрол на проекта (**Project Monitoring and Control=PMC**) е да осигури разбиране на **напредъка** в проекта, така че да бъдат могат да бъдат предприети **адекватни коригиращи действия**, когато изпълнението на проекта се отклонява значително от плана.



SG 1: Monitor Project Against Plan

Actual performance and progress of the project are monitored against the project plan.

SG 2: Manage Corrective Action to Closure

Corrective actions are managed to closure when the project's performance or results deviate significantly from the plan.

When Project Monitoring and Control Is Not Done Well...

Too much time is spent trying to determine **project status**.

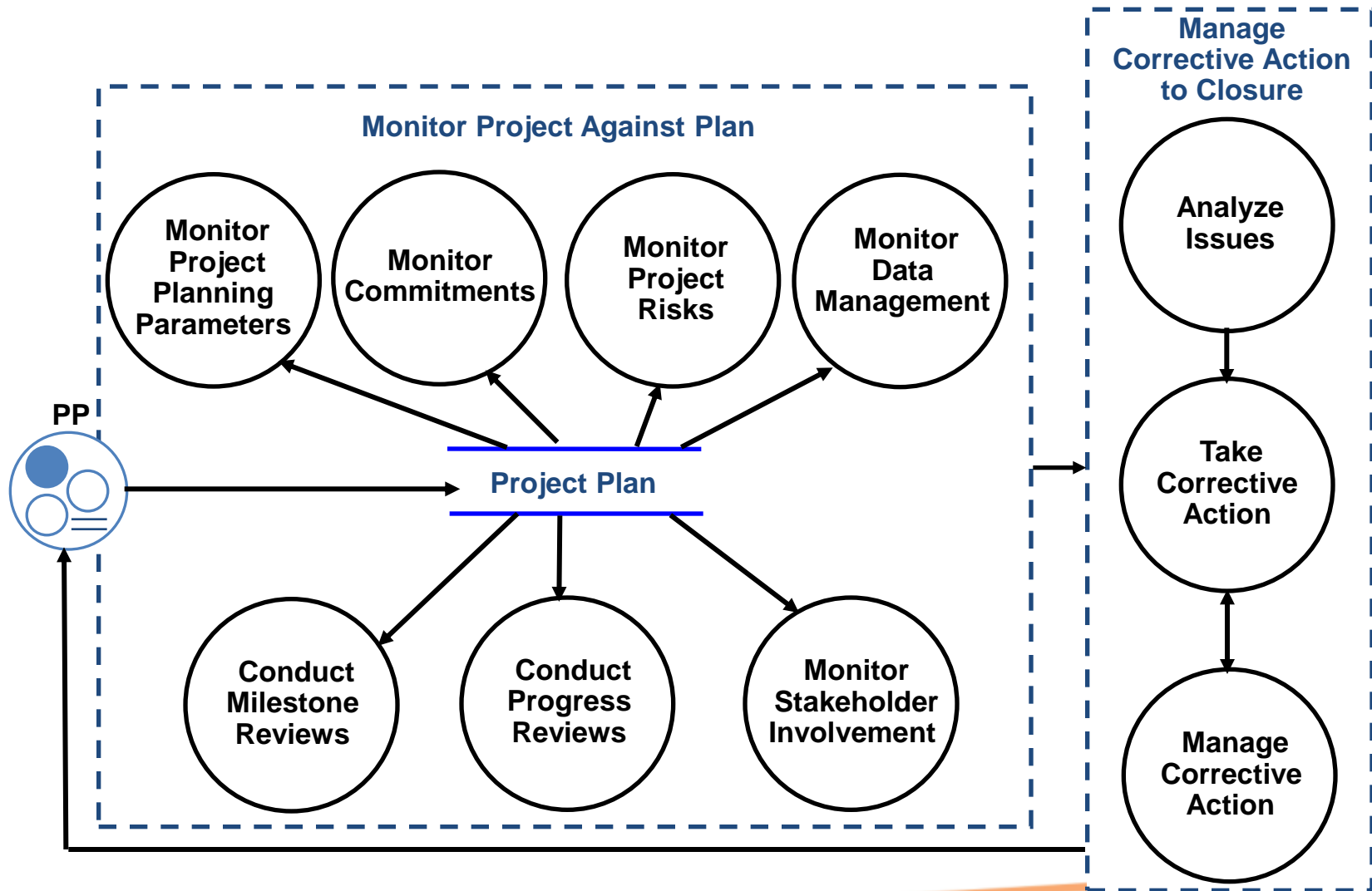
Data needed for management decisions are **not available** when needed.

Corrective action is not taken early when it is least expensive.

Lack of management insight makes project **results highly unpredictable**.

The **customer does not have confidence** in the project status reporting.

Project Monitoring and Control Context



Project Monitoring SPs

PMC also interacts with the Project Planning PA. **The project plan is developed in Project Planning and used in Project Monitoring and Control.**

SP 1.1 “Monitor Project Planning Parameters” –

This practice monitors progress against the parameters established in the project plan (e.g., schedule, cost, expended effort, and resources).

SP 1.2 “Monitor Commitments” - Monitoring emphasizes identifying commitments that have not been satisfied or are at significant risk of not being satisfied and evaluating the impacts of these unsatisfied commitments.

Project Monitoring SPs

SP 1.3 “Monitor Project Risks” - Monitoring project risks involves periodically reviewing the project’s documented risks in light of the current status and circumstances.

SP 1.4 “Monitor Data Management” - Monitoring data management involves periodically reviewing data management activities against their description in the project plan.

SP 1.5 “Monitor Stakeholder Involvement” - Monitoring stakeholder involvement includes periodically reviewing the status of stakeholder involvement and identifying and documenting significant issues and their impacts.

Project Monitoring SPs

SP 1.6 “Conduct Progress Reviews” - This specific practice is distinct from conduct milestone reviews, which focuses on reviews at major project milestones and phase boundaries. Conducting progress reviews involves regularly communicating status on assigned activities and work products to relevant stakeholders and reviewing the results of collecting and analyzing measures for controlling the project.

SP 1.7 “Conduct Milestone Reviews” - Milestone reviews are conducted at meaningful points in the project’s schedule and include reviewing the commitments, plan, status, and risks of the project.

Explain that the next 3 specific practices support the accomplishment of the specific goal, “Manage Corrective Actions to Closure.”

Project Monitoring SPs

SP 2.1 “Analyze Issues” - Analyzing issues involves gathering issues for analysis and analyzing them to determine the need for corrective action. Corrective action criteria are established in project planning.

SP 2.2 “Take Corrective Action” - Corrective actions are taken as necessary when issues are identified or when progress differs significantly from what was planned.

Project Monitoring SPs

SP 2.3 “Manage Corrective Action” –

Managing corrective action includes monitoring corrective actions for completion, analyzing the results of corrective actions to determine the effectiveness of the corrective action, and determining and documenting appropriate actions to correct deviations from planned results of corrective actions.

The essence of PMC

- **PMC:**
 - monitoring activities
 - communicating status
 - taking corrective action
- **Progress** – at **prescribed milestones** (WBS/Schedule) comparing to the planned:
 - Actual work product and task attributes
 - Effort, cost, and schedule
- When actual status **deviates significantly** – corrective actions
- Corrective actions may include **re-planning (PP)**

PMC Actions

- **Monitored:**
 - Progress against the schedule
 - Cost, expended effort, staffing and training
 - Actual resources usage
- **Deviations documented?**
- Internal and external commitments **regularly reviewed?**
- **Risks status** regularly reviewed/communicated to relevant stakeholder?
- Data management tasks regularly reviewed?
- **Progress reviews:**
 - Task status communicated?
 - Results documented?
- **Milestone reviews** conducted?
- Manage **corrective actions to closure**
 - Issues analyzed and documented?
 - Corrective actions tracked to closure?
 - Results analyzed?



VIA 9GAG.COM

Remember - Generic practices ML2?

GP2.1: Establish an Organizational Policy

GP2.2: Plan the Process

GP2.3: Provide Resources

GP2.4: Assign Responsibility

GP2.5: Train People

GP2.6: Manage Work Products

GP2.7: Identify and Involve Relevant Stakeholders

GP2.8: **Monitor and Control the Process**

GP2.9: Objectively Evaluate Adherence

GP2.10: Review Status with Higher Level Management

Sampling the Generic Practices

GP 2.8: Monitor and Control the Process

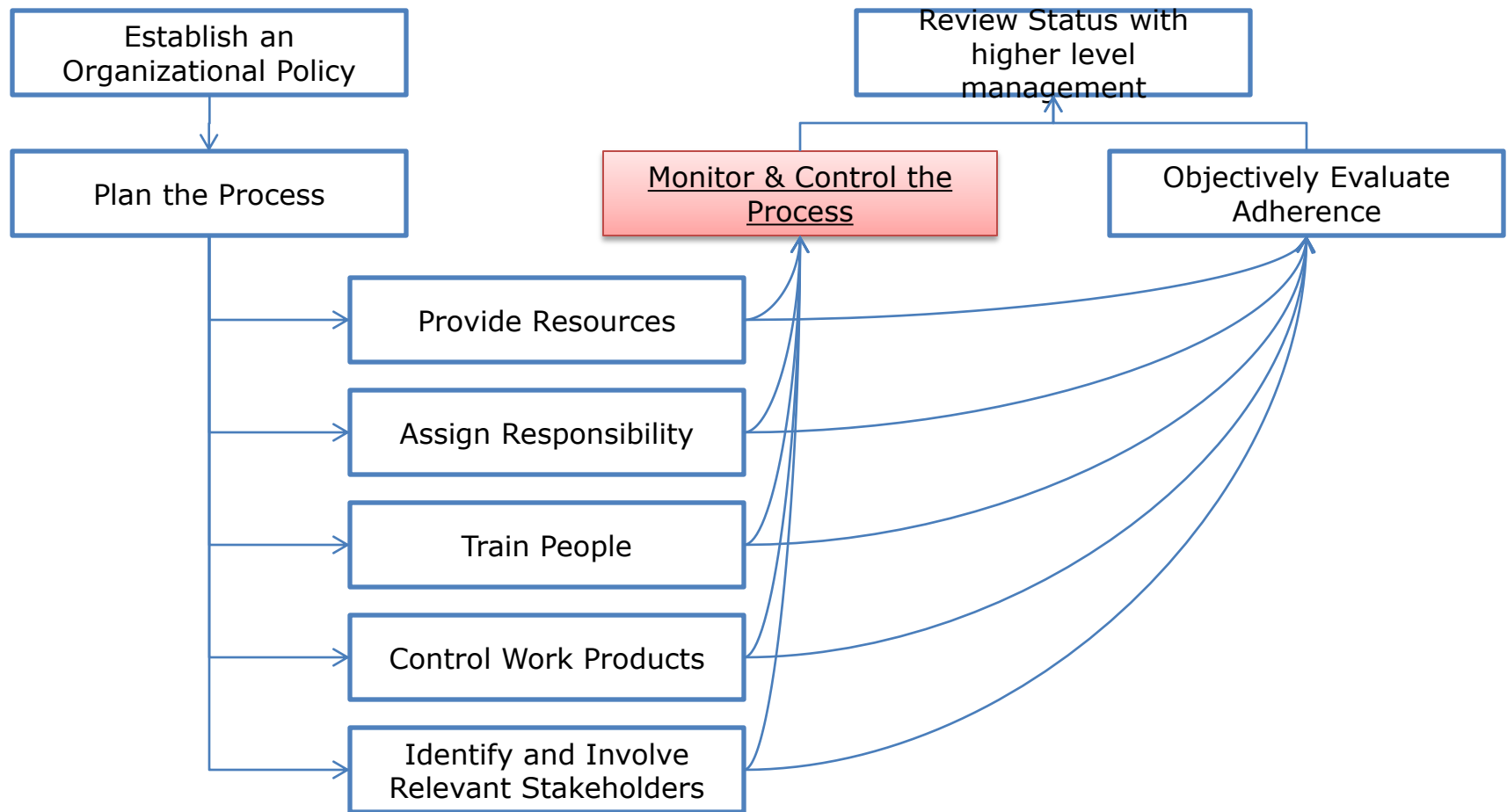
Monitor and control the project monitoring and control process against the plan for performing the process and take appropriate corrective action.

Elaboration for Project Monitoring and Control

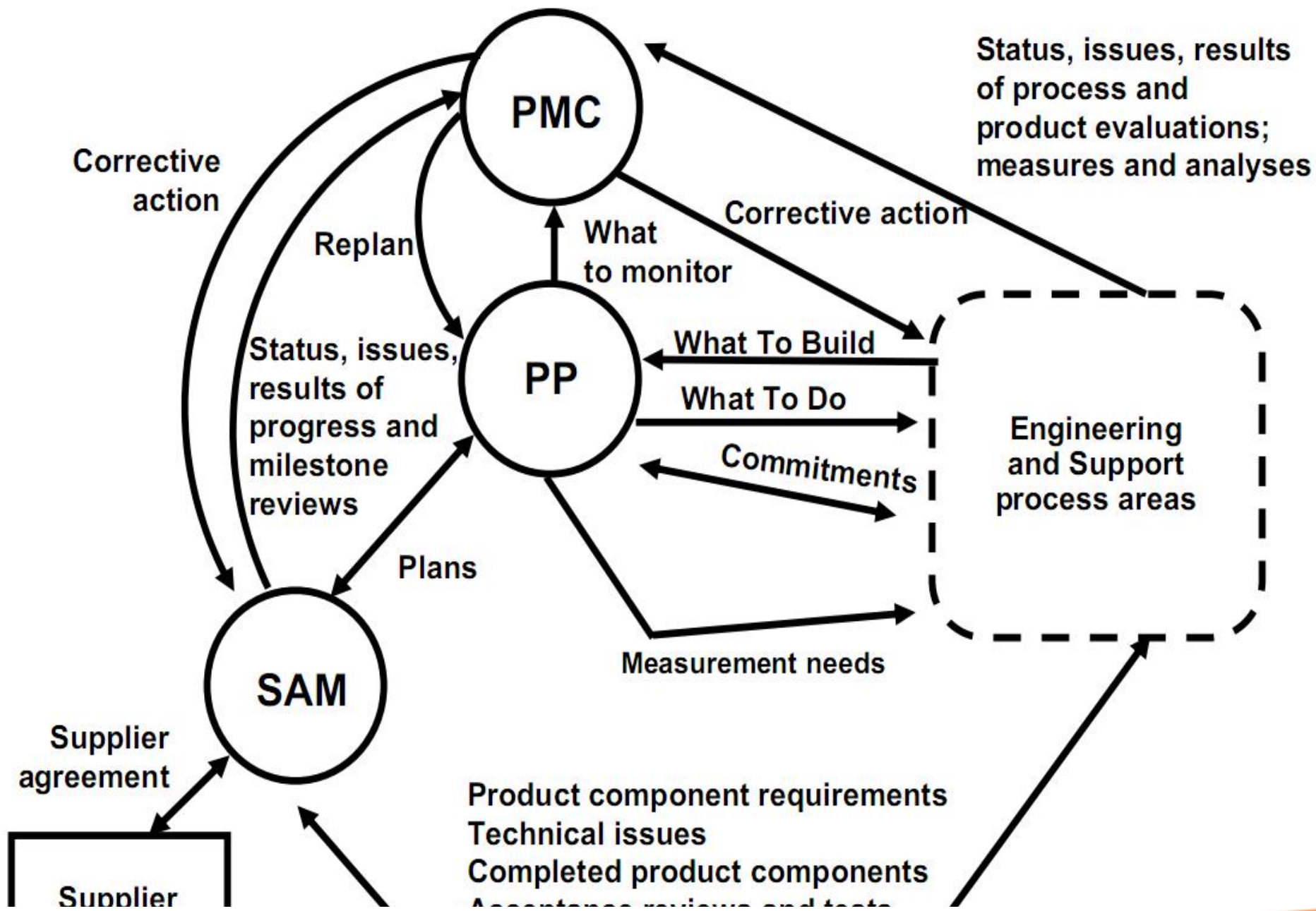
Examples of measures and work products used in monitoring and controlling include the following:

- number of open and closed corrective actions
- schedule with status for monthly financial data collection, analysis, and reporting
- number and types of reviews performed
- review schedule (planned versus actual and slipped target dates)
- schedule for collection and analysis of monitoring data

How PMC relates to Generic Practices?



Source: Kiril Karaatanasov, ESI Center Bulgaria



Just to mention SAM

(Supplier Agreement Management)

*The purpose of Supplier Agreement Management (SAM) is to **manage the acquisition of products and services** from suppliers.*



SG 1: Establish Supplier Agreements

Agreements with the suppliers are established and maintained.

SG 2: Satisfy Supplier Agreements

Agreements with suppliers are satisfied by both the project and the supplier.

The essence of SAM

Applies to the acquisition of:

- products/components** that are **delivered** to the project's customer

- significant products/components **not delivered** to the project's customer (for example, development tools and test environments).

Does not apply when supplier is part of the team

Suppliers:

- in-house vendors

- fabrication capabilities and laboratories

- commercial vendors

The acquired product is delivered to the project from the supplier and **becomes part of the products delivered to the customer**

SAM Practices for next lecture:

Type of acquisition (COTS, contract, in-house, from the customer) determined?

Supplier **selection based on evaluation?**

Criteria for evaluation established/documented?

Criteria for evaluation of proposals?

Agreement with supplier documented?

Agreement revised during project?

Criteria of evaluation of COTS?

Risk analysis performed on COTS?

Monitoring activities defined in the agreement?

Technical/management reviews with supplier performed?

Acceptance test/verification performed and results documented?

Next: Supporting PAs ML2:

- Requirements Management
- Project Planning
- Project Monitoring & Control
- **Process and Product Quality Assurance**
- **Measurement & Analysis**
- **Configuration Management**
- Supplier Agreement Management