

Chapter 2

Process: A Generic View

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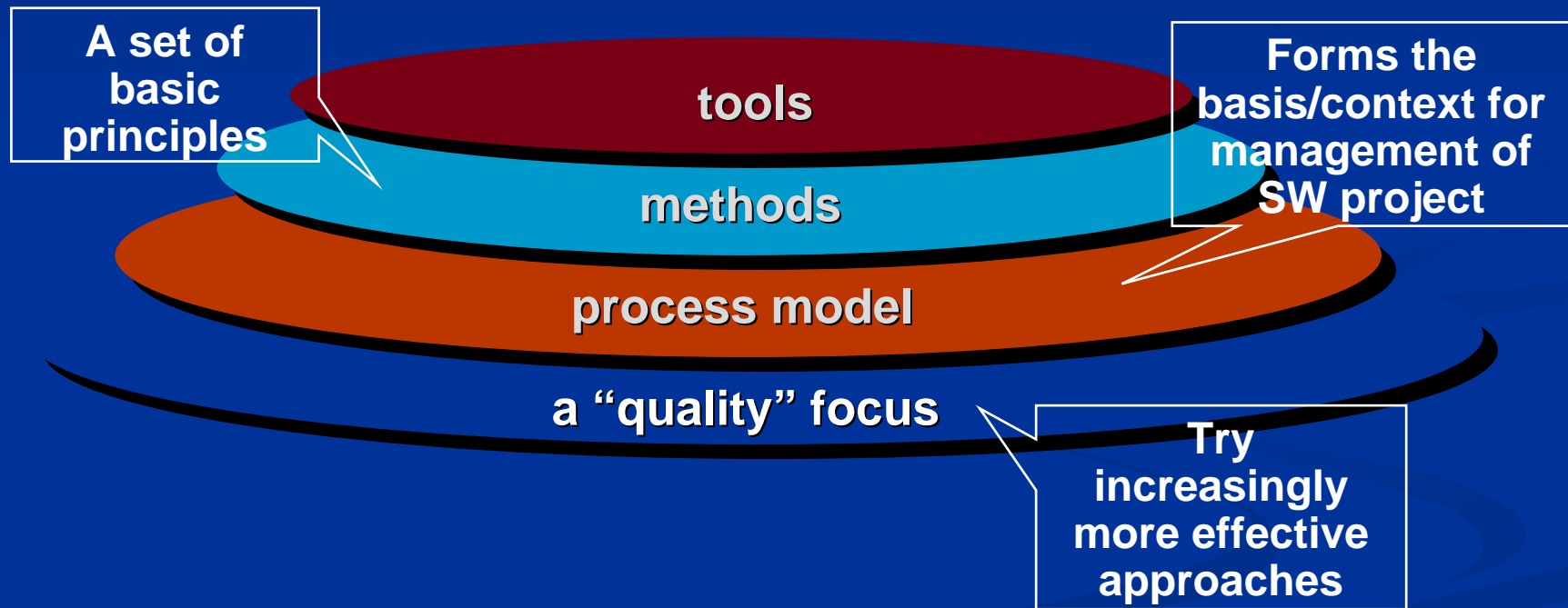
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A Layered Technology

Software Engineering



A Process Framework

Process framework

Framework activities

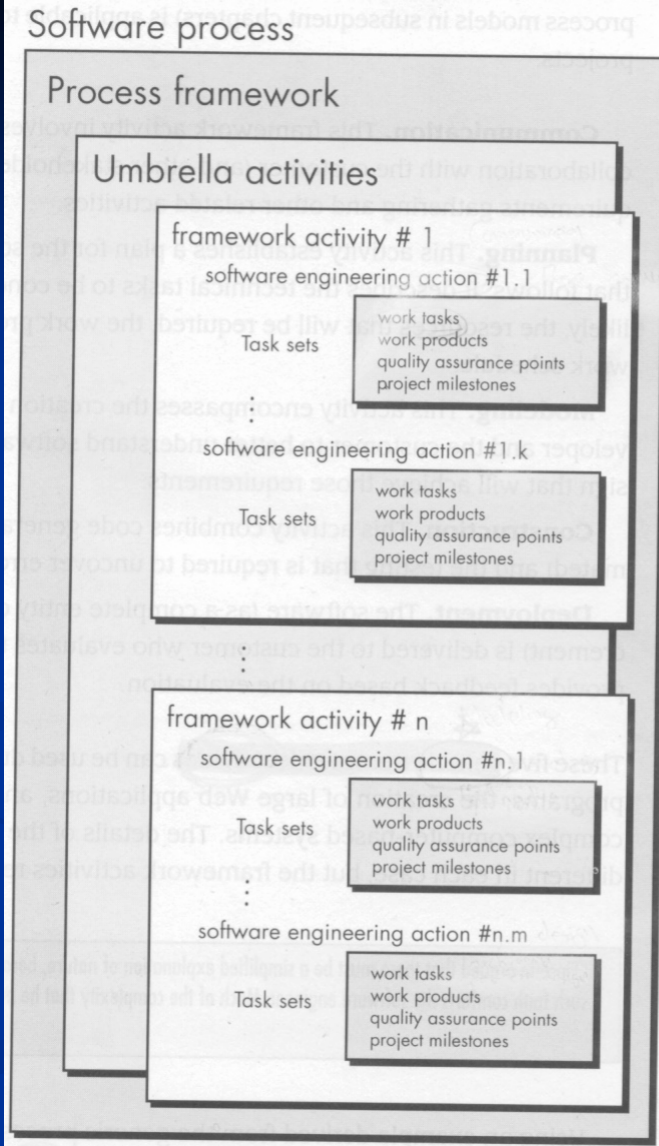
work tasks

work products

milestones & deliverables

QA checkpoints

Umbrella Activities



Framework Activities

- Communication
- Planning
- Modeling
 - Analysis of requirements
 - Design
- Construction
 - Code generation
 - Testing
- Deployment

Umbrella Activities

- Software project management
- Risk management
- Software quality assurance
- Formal technical reviews
- Software configuration management
- Work product preparation and production
- Reusability management

The Process Model: Adaptability

- the framework activities will always be applied on every project ... BUT
- the tasks (and degree of rigor) for each activity will vary based on:
 - the type of project
 - characteristics of the project
 - common sense judgment; concurrence of the project team

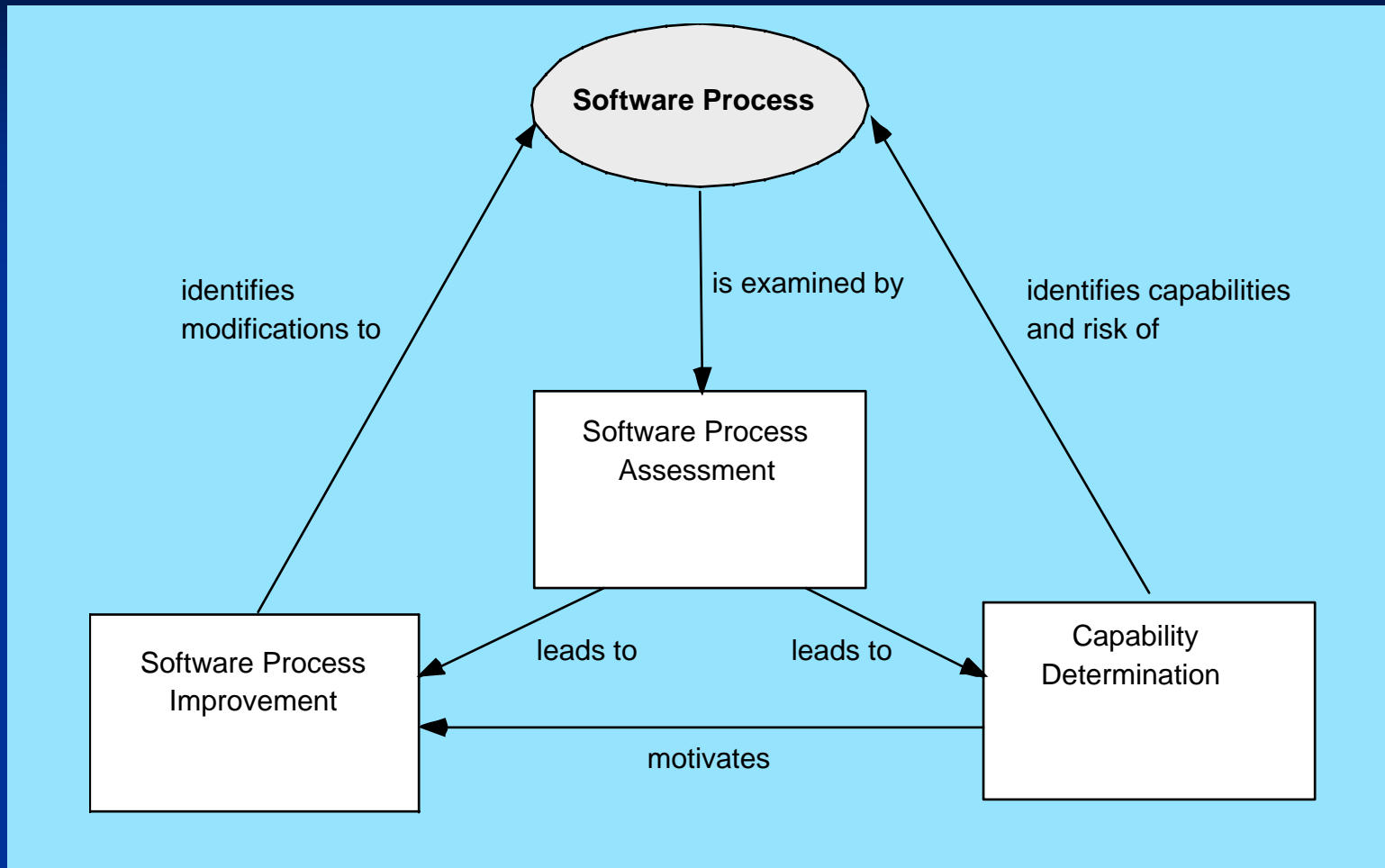
The CMMI

- The CMMI (Capability Maturity Model Integration) defines each process area in terms of “specific goals” and the “specific practices” required to achieve these goals.
 - Level 0: Incomplete
 - Level 1: Performed
 - Level 2: Managed
 - Level 3: Defined
 - Level 4: Quantitatively managed
 - Level 5: Optimized
- *Specific goals* establish the characteristics that must exist if the activities implied by a process area are to be effective.
- *Specific practices* refine a goal into a set of process-related activities.

Process Assessment

- The process should be assessed to ensure that it meets a set of basic process criteria that have been shown to be essential for a successful software engineering.
- Many different assessment options are available:
 - SCAMPI (Standard CMMI Assessment Method for Process Improvement)
 - CBA IPI (CMM-Based Appraisal for Internal Process Improvement)
 - SPICE (ISO/IEC15504)
 - ISO 9001:2000

Assessment and Improvement



Personal Software Process (PSP)

- Recommends five framework activities:
 - Planning
 - High-level design
 - High-level design review
 - Development
 - Postmortem
- stresses the need for each software engineer to identify errors early and as important, to understand the types of errors

Team Software Process (TSP)

- Each project is “launched” using a “script” that defines the tasks to be accomplished
- Teams are self-directed
- Measurement is encouraged
- Measures are analyzed with the intent of improving the team process