

SPEM Overview

Presented as part of the Osellus Webinar series

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- **What are processes, and why should we model them?**
 - SPEM – the highlights
 - The Future

Process Challenges and Obstacles

- Complexity of software development
- Software systems are becoming more complex, time to market is shrinking – development is becoming increasingly complex and often fragmented
- Process Development and Maintenance – difficulty of assembling and “growing” processes
- Ideally, processes should be scalable or easily adjusted to fit individual projects
- Continuous improvement is becoming prohibitive

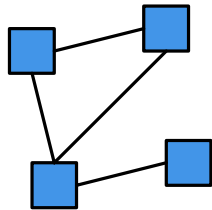


Software Process Engineering – why SPEM?

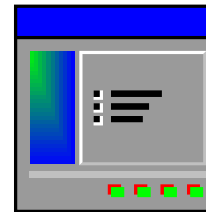
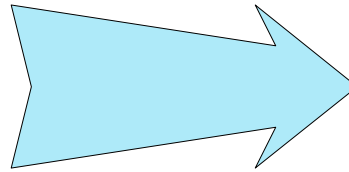
- No common, agreed-upon definition of what software process engineering should comprise
- No standardized approach to designing a process based on requirements
- Numerous and varied drivers – organization and team culture, established practices and habits, project type/size/budget, novelty, cost of failure, process resentment factor, commitment to standards, problem domain
- No standard (either open or defacto) for SPE
- Open standards vs. proprietary solutions

What is a model?

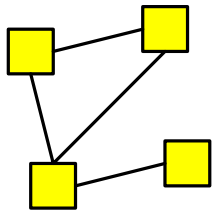
- “Model” = a set of statements describing/prescribing the essential workings of something
- “Process Model” = model of a software development methodology. Describes/prescribes a specific and particular way of developing software.



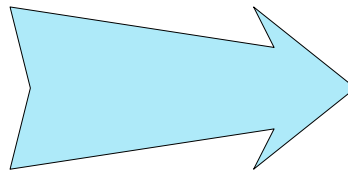
Design Mode



Code



Process Model



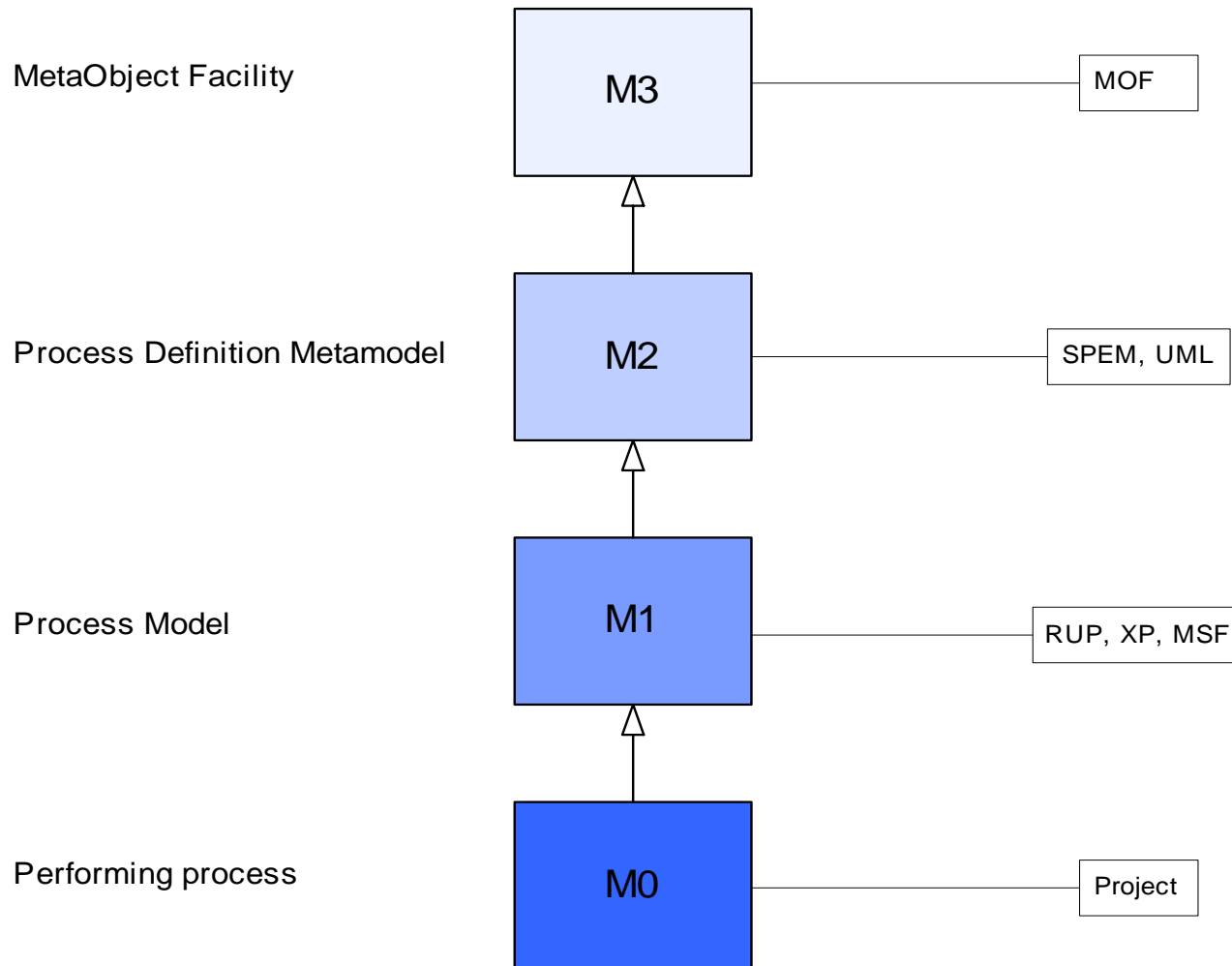
Our Current Arsenal

- Quality programs
- Better tools
- Offshore/outourcing models
- Change in methodology/process

- What are processes, and why should we model them?
- **SPEM – the highlights**
 - Introduction
 - Process modeling building blocks
 - Process structure
 - Process model organization and management
- The Future

- Software Process Engineering Metamodel
- Standardized way of expressing *any* software development process
- Specifically for software development processes
- Vendor, framework, methodology neutral
- Leverages expressiveness and popularity of UML
- www.omg.org, document number formal/2003-11-14

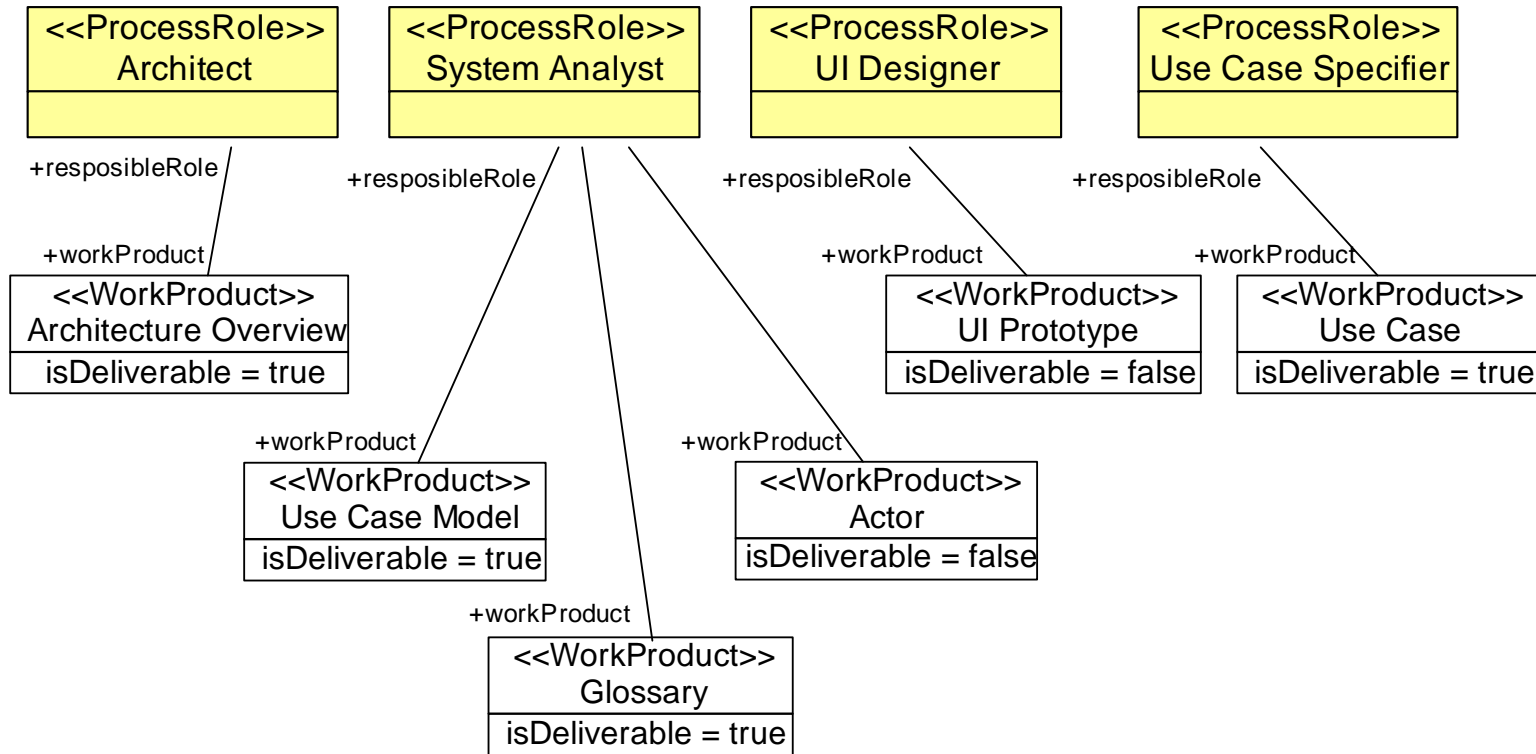
Layers of Abstraction



- Basic building blocks of a process model
- Process structure
- Process organization and management

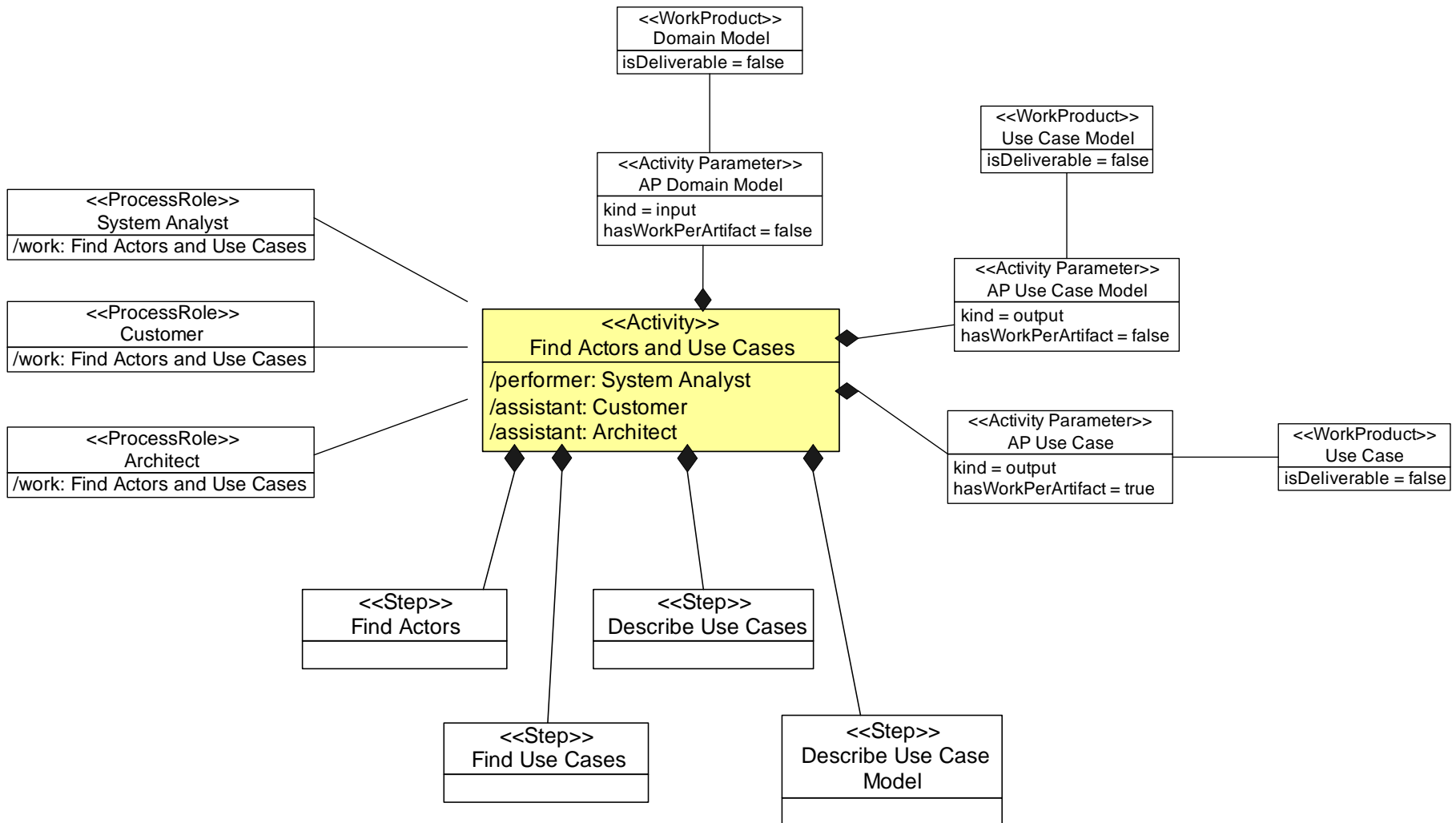
- Corresponds to the “who” of a process
- ProcessRoles are not job descriptions or job titles! A ProcessRole is not a person.
- Meaningful grouping of skills and responsibilities
- “Worker” in UP, “role” in IBM GSM and others, also “agent”.

ProcessRole example



- Corresponds to the “what” of a process – as in, what is being done
- Activity: piece of work performed by a single ProcessRole
- 1 performer, any number of assistants
- May consist of atomic Steps, which may be represented by activity graphs
- WorkProducts are the inputs and outputs, via an association class.

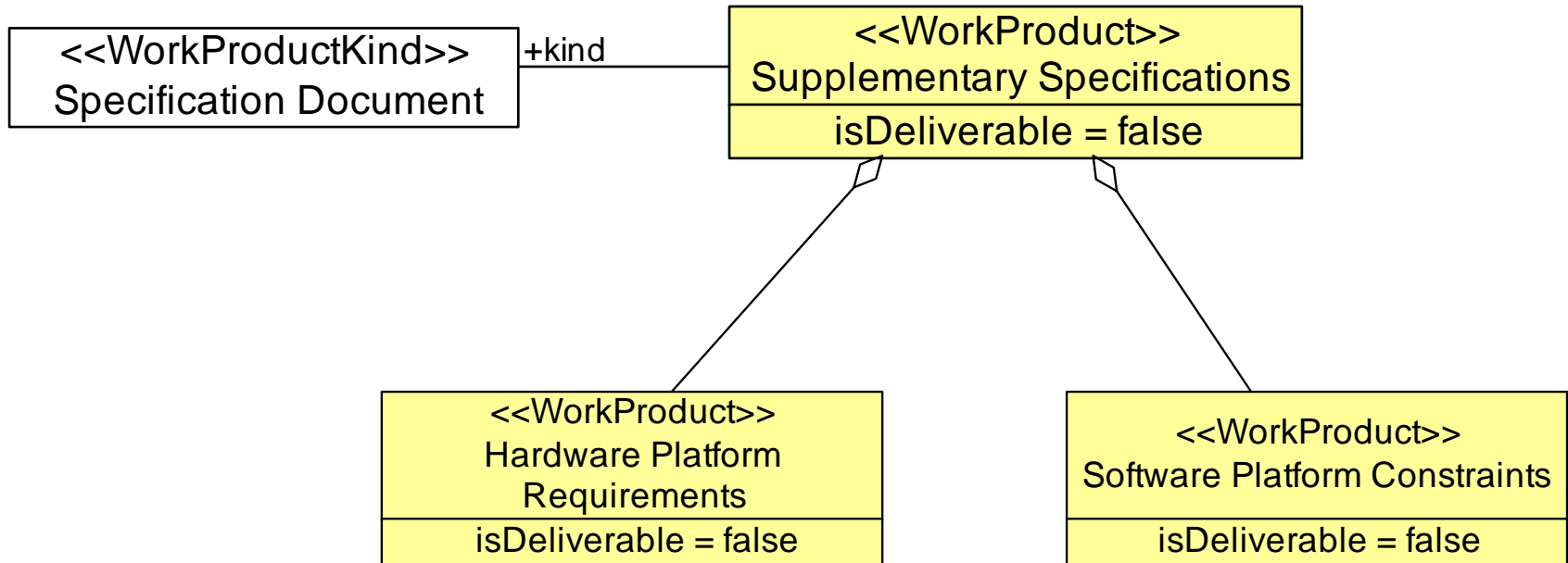
Activity Example



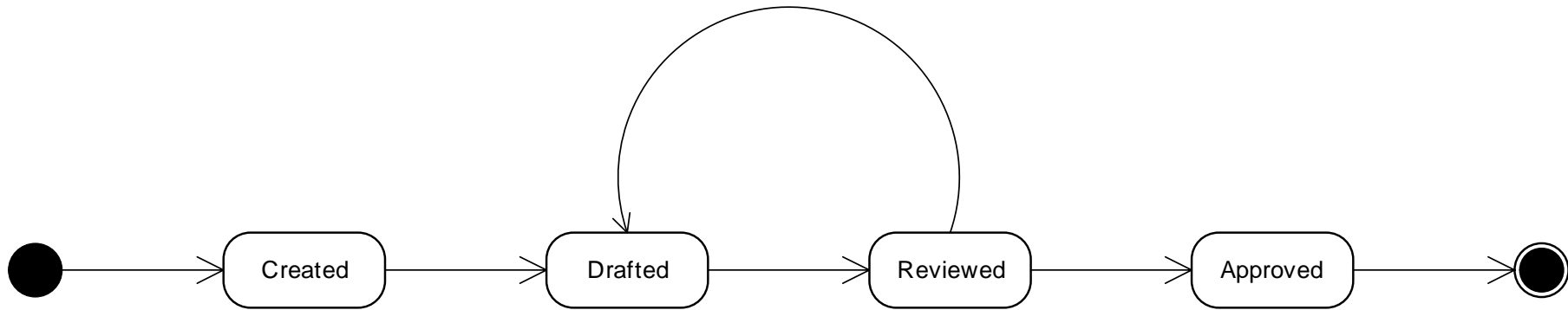
WorkProducts

- Makes the other half of the “what” of a process – as in, what is being produced
- WorkProducts are the artifacts of a process – any tangible piece of information produced, consumed, or modified
- Could be any format or media – use WorkProductKinds to distinguish
- Can be aggregated, and have state machines
- “Artifact” in RUP and QuadCycle, “Work Product Description” in IBM processes, “deliverable” or “product” in others.

Aggregate WorkProducts

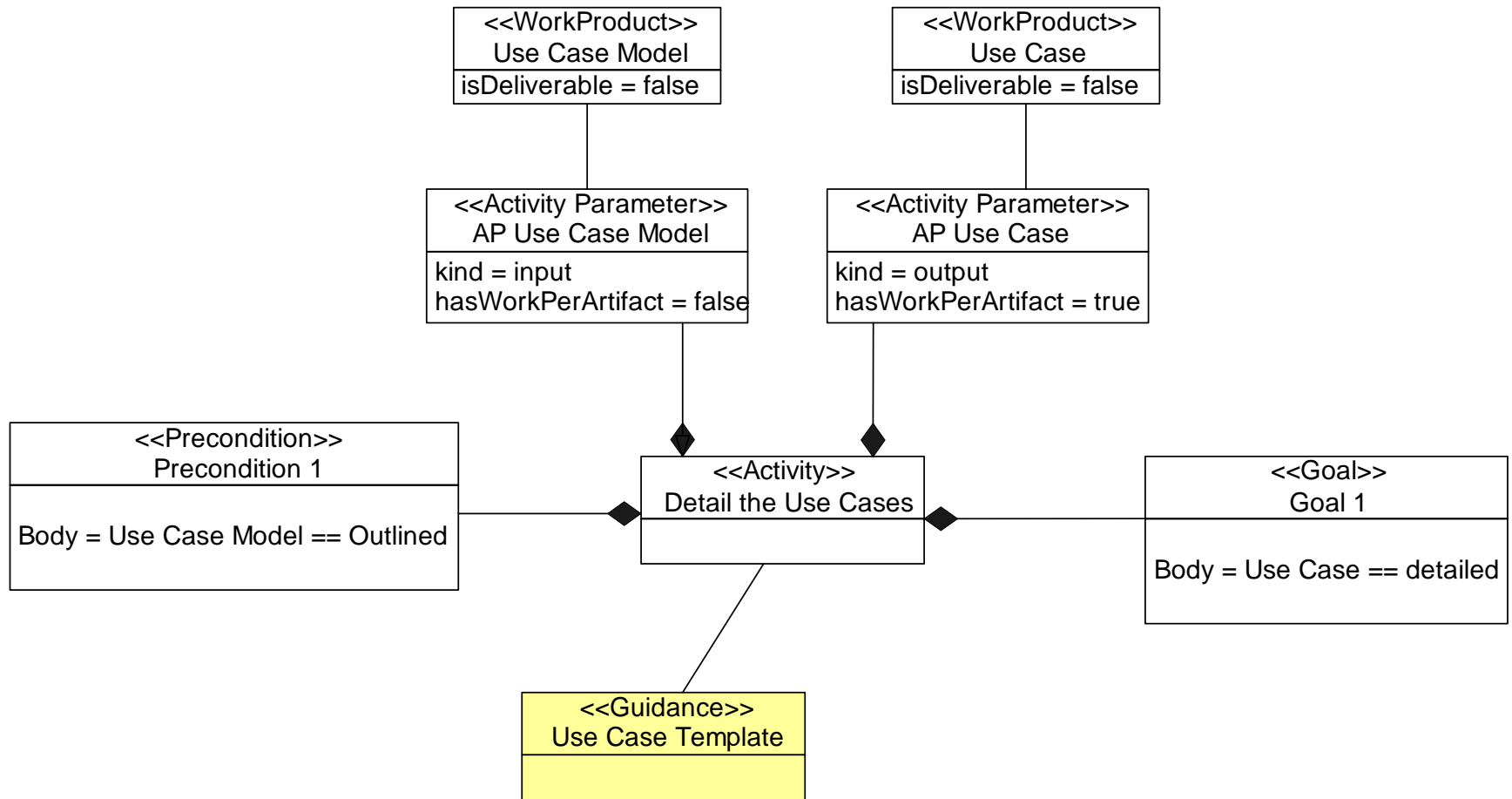


WorkProduct State Machines



- Are not WorkProducts – neither produced nor modified by the process.
- Any element (or package) may have any number of Guidances.
- Must have an assigned GuidanceKind (Technique, UMLProfile, Checklist, ToolMentor, Guideline, Template, Estimate, Technology Roadmap).

Guidance Examples



Work Breakdown Structure

- The work breakdown structure (WBS) of a process model describes the work to be performed, and the general flow of activities.
- SPEM identifies a set of work breakdown structure elements, at varying levels of detail: Lifecycle, Phase, Iteration, WorkDefinition, Activity.

Higher-level WBS Elements

- WorkDefinition: describes a composite set of Activities
- Iteration: composite WorkDefinition with a minor milestone
- Phase: the span of time between two milestones (specific entry and exit criteria). No overlap.
- Lifecycle: describes the behavior of a complete process to be enacted in a particular project (series of Phases)

<<Dependency>> Precedes
kind = finish-start

<<Dependency>> Precedes
kind = start-start

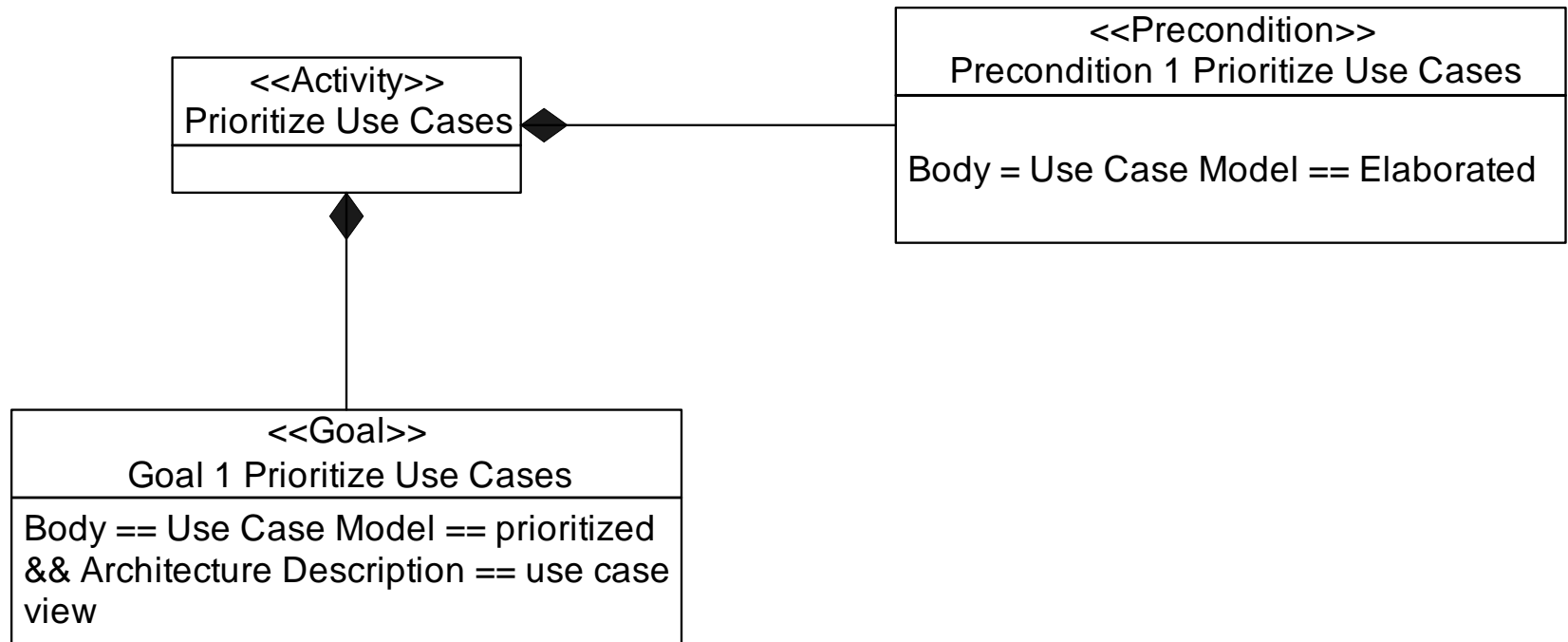
<<Dependency>> Precedes
kind = finish-finish

- Finish-Start, Finish-Finish, Start-Start
- Phases are linked via Finish-Start (since no overlap)

Preconditions and Goals

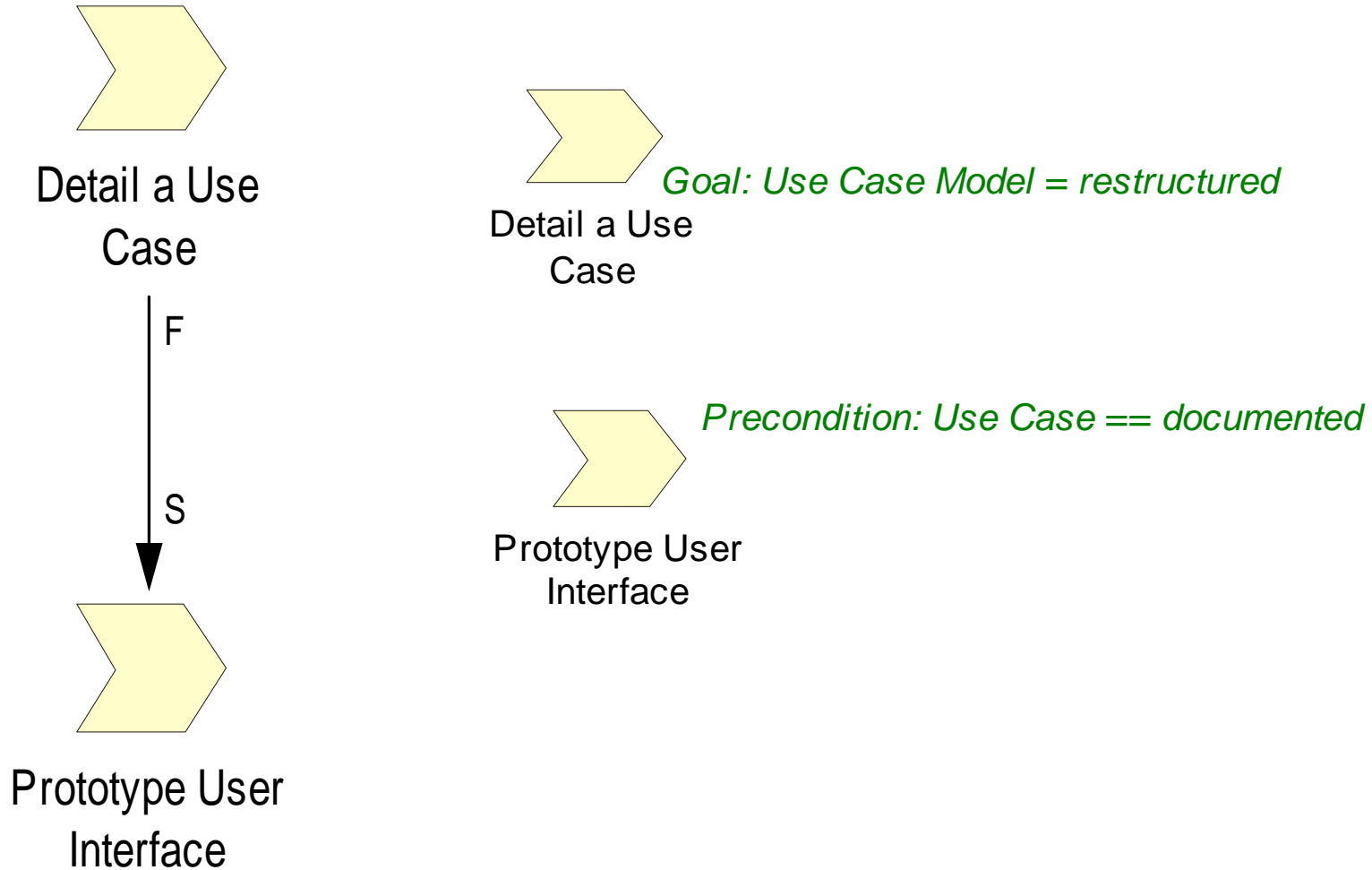
- Expressed in terms of WorkProduct states
- Boolean expression
- Necessary for commencement/conclusion of a WorkDefinition-class element, but not sufficient!

Precondition and Goal example



- Use Preconditions, Goals, and Precedes to construct the work breakdown structure
- Combination of completion-based and condition-based rules is flexible and powerful

Workflow Comparison

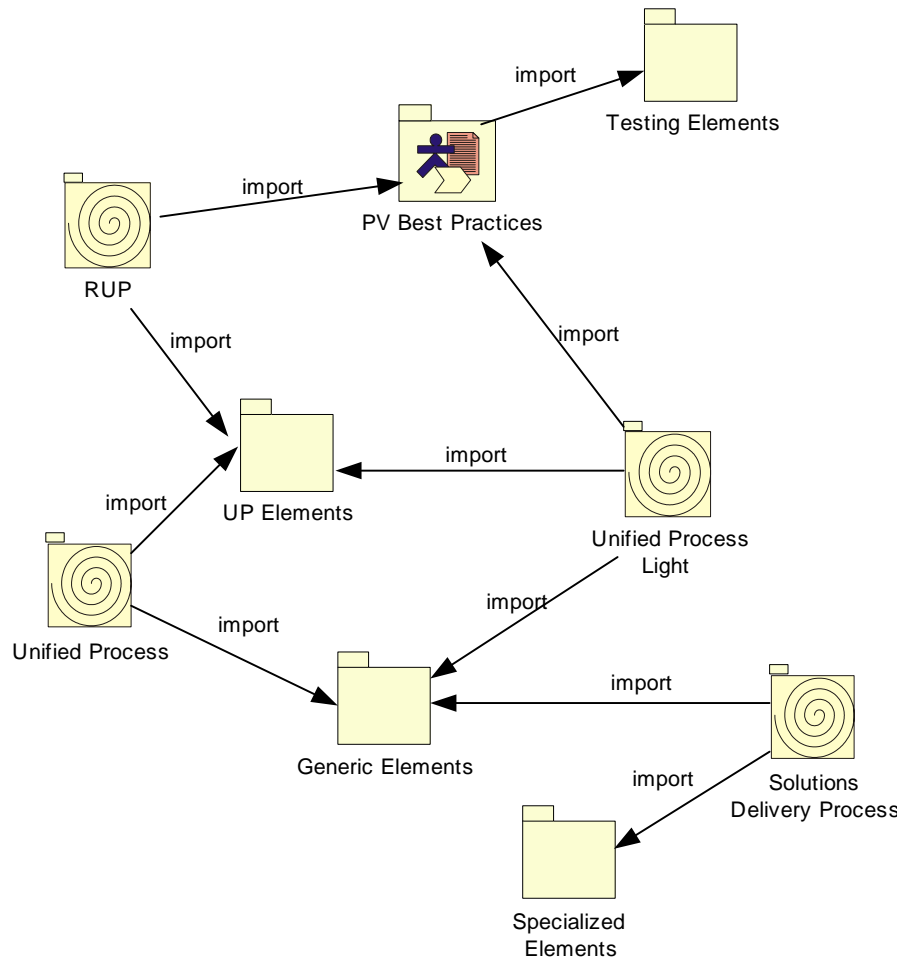


SPEM Package Types

- Package: as in UML, a container that can both own and import process definition elements.
- ProcessComponent: self-contained, internally consistent piece of process description. May be composed.
- Process: complete, end-to-end process.
- Discipline: specialization of Package used to categorize Activities according to a common theme.

- How do we manage models, once they have been defined at the elemental/structural level?
- Helps ease the path for process customization and evolution

- Modularity and reuse



- What are processes, and why should we model them?
- SPEM – the highlights
- **The Future**

- SPEM 2.0 RFP is being worked on
 - spem2rfp@omg.org
- Eventual alignment with Business Process Definition Metamodel is a long-term goal.
- Starting to see SPEM-enabled process modeling tools in the marketplace. Process automation is not far away!
- Vendors like IBM/Rational, Softeam are implementing SPEM, and more organizations are starting to use it to model their processes.