7th Annual CMMI® Technology Conference

Formal Process Definition with Industry Standards

Armstrong Process Group, Inc.
www.aprocessgroup.com

APG

- Formalize an organization's process architecture using industry standards
  - Software and Systems Process Engineering Metamodel 2.0 (SPEM)
  - Discuss different compliance levels of formal process definition
- Build a process asset library (PAL) using method content (tasks, roles, and work products)
- Configure base method content into different configurations for different lifecycle models
- Enable enterprise process integration
- Make actionable work breakdown structures which precisely represent the organization defined process
- Eclipse Process Framework (EPF) overview
- Briefly demonstrate an open source tool (EPF Composer) for capturing, tailoring, and publishing process definitions

ment Teams Are Facing Today

Project plan templates

Article on serialized java beans

Website with Configuration mgmt guidelines

Book on J2EE

Lessons learnt from previous project and iteration

JUnit user guide

Wiki on agile development

Latest research on effectiveness of pair programming

Knowledge base on managing iterative development

Corporate guidelines on compliance

- No **common language** or terminology between processes - redundancy and inconsistencies
- Knowledge cannot easily be **customized** for different projects or new best practices
- No **central community** or **communication framework** to facilitate convergence of best practices across domains

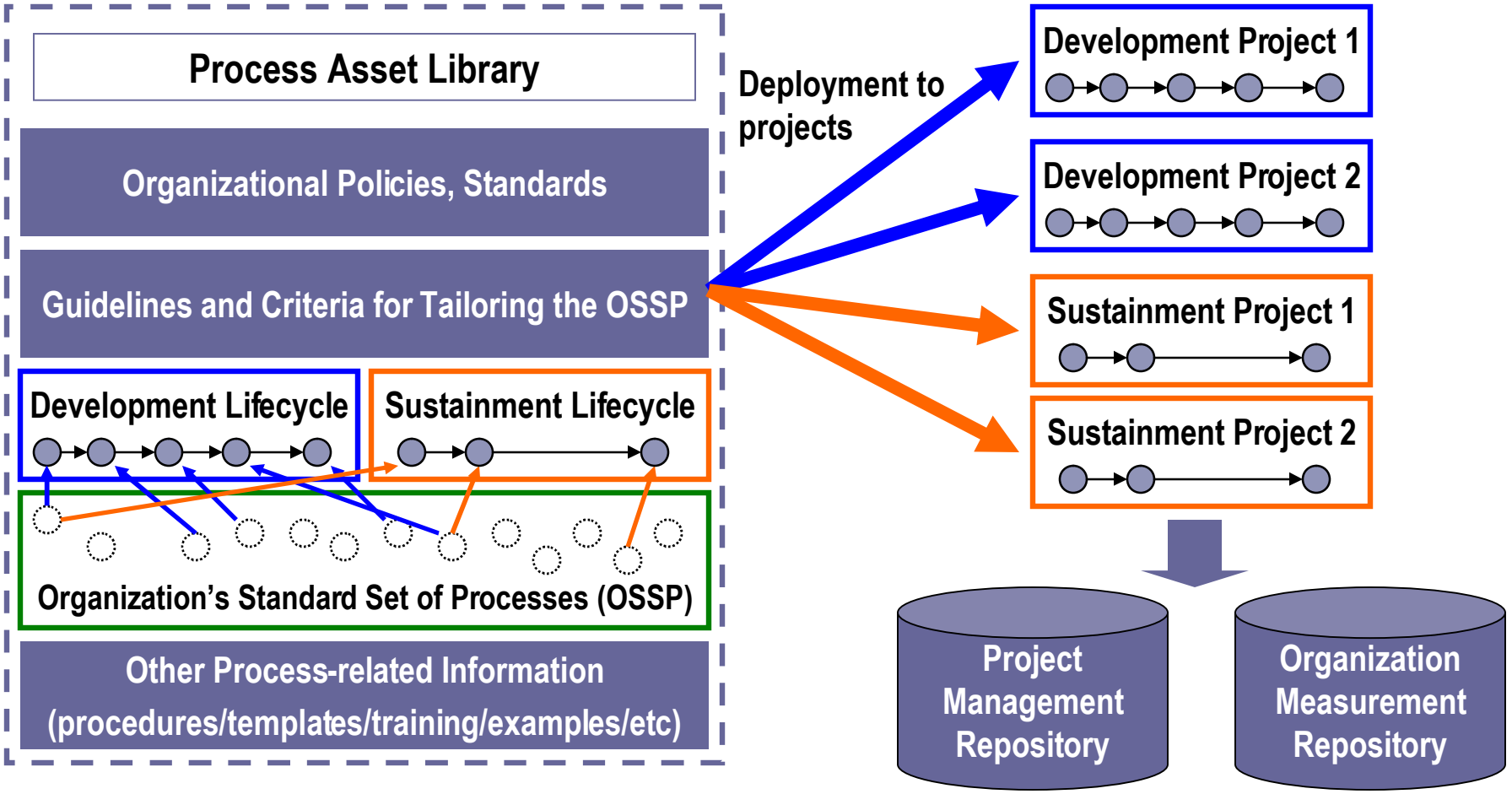
APG

tions Are Facing Today

- Have multiple, concurrent process lifecycles
  - Enterprise architecture, portfolio management, solution delivery, service management, governance
- Difficult to integrate process lifecycles
- Unclear roles and responsibilities
- Challenges acquiring new resources (whether employees or contractors) and rapidly orienting them to internal processes
- Must be compliant with internal and external processes for meeting regulatory and quality requirements

ecture and Integration

Processes arranged in a "list" fashion – no easy way to navigate and use processes – "difficult to follow the trail of breadcrumbs!"

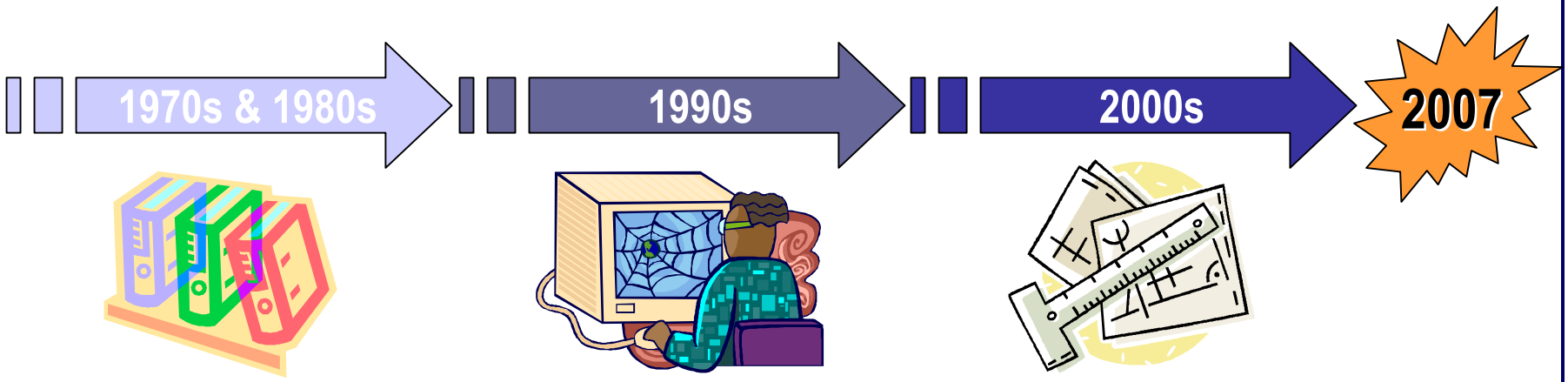


APG

ation Objectives

- Create a defined process that enables achievement of cost of quality and cost of production goals
- Improve ability to acquire appropriate resources via clearer role definition
- Identify lifecycle integration touchpoints
  - And outsourced vendor handoffs
- Enable new project resources (either new employees or new contractors) to get up to speed very quickly by embracing industry standards
- Enable useful asset management through standard work products and integrated tool usage
- Improve employee satisfaction via clearer roles and increased team collaboration

dustry – Process Management



Three-Ring Binders

- Demonstrated organization commitment
- Often became shelfware

Websites

- More accessible by practitioners
- Often difficult to navigate and maintain

Model-Driven

- Access to industry standard frameworks
- Integration of multiple lifecycles
- Formal process asset management

APG

...oach

Standardize representation and manage libraries of reusable **Method Content**

- Content on agile development
- Content on managing iterative development
- Guidance on serialized java beans

- JUnit user guidance
- Content on J2EE
- Configuration mgmt guidelines

Develop and manage **Processes** for performing projects

- Lessons learnt from previous project and iteration
- Corporate guidelines on compliance

- Process assets patterns
- Standard or reference processes
- Project plan templates

Configure a cohesive process framework customized for my project needs

Create project plan templates for **Enactment** of process in the context of my project

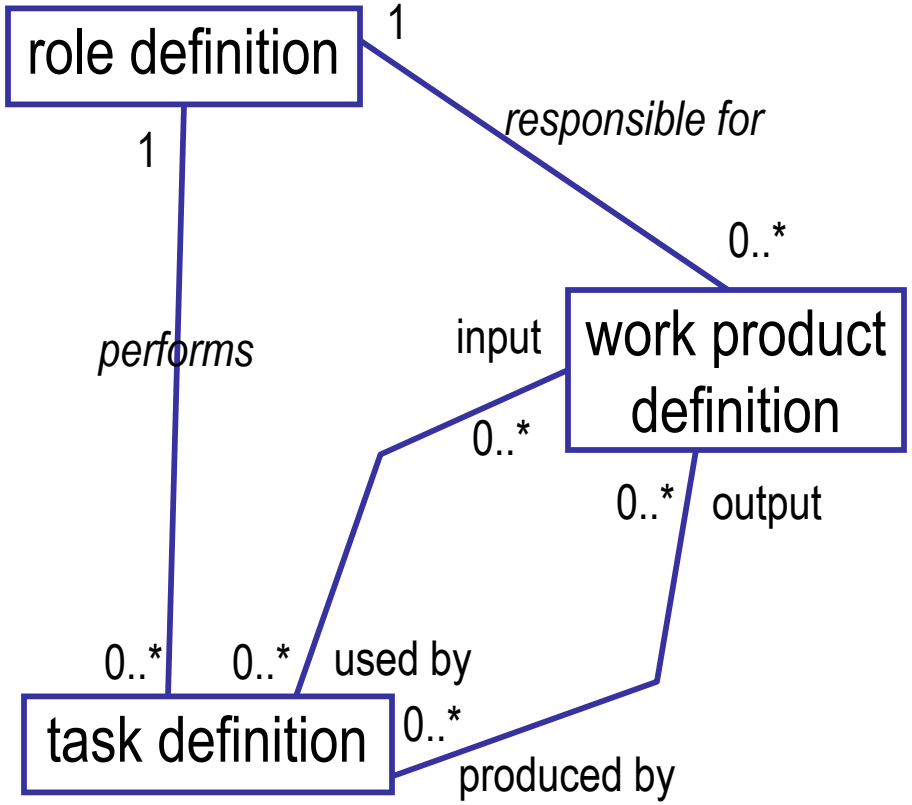
tems Process Engineering Metamodel

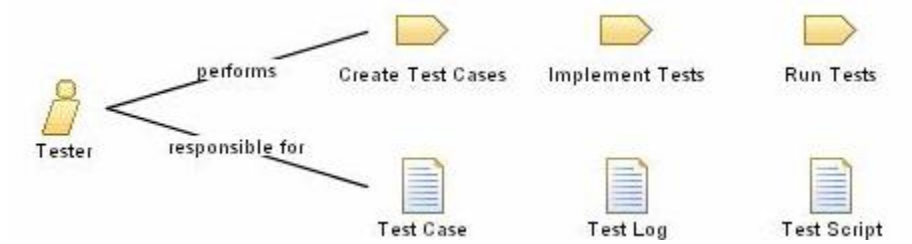
- SPEM 2.0 was adopted by the Object Management Group (OMG) in December 2006 – SPEM 1.0 around since 2002
- Provides necessary concepts for modeling, documenting, presenting, managing, interchanging, and enacting development methods and processes
- Provides standardized representation and managed libraries of reusable method content
- Supports systematic development, management, and growth of development processes
- Supports deployment of method content and process needed by defining configurations of processes and method content
- Supports enactment of process for development projects

ent – Guidance

- Can be associated with any process model element to provide more detailed information about the element to the practitioner
  - Can standalone – does not have to be associated
- Most often associated with activities and work products
- SPEM comes with a set of built-in guidance types
  - Checklist
  - Template
  - Example
  - Tool mentor
  - Guideline

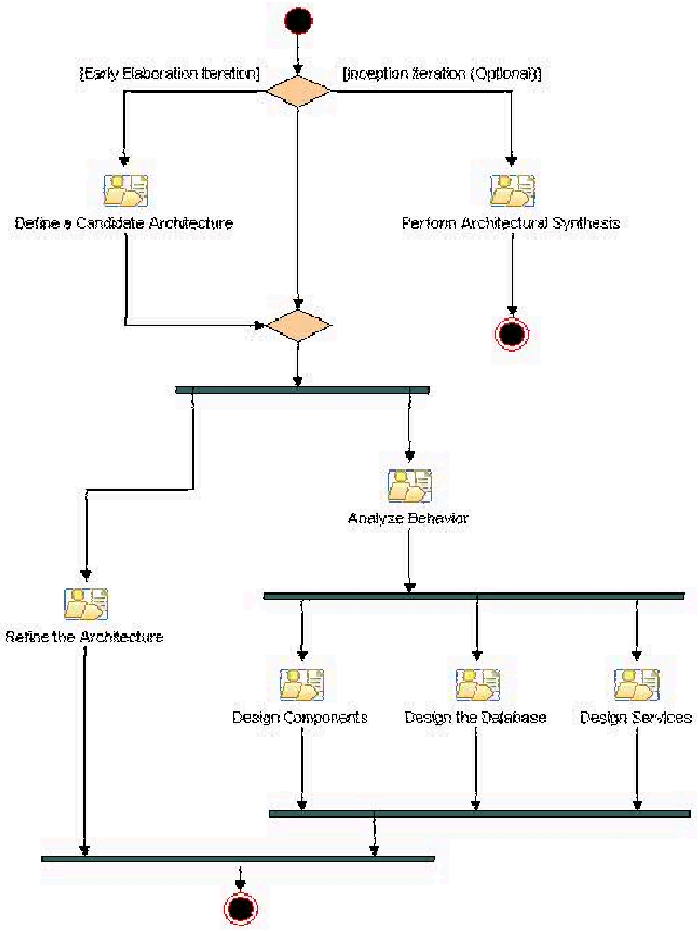
Content

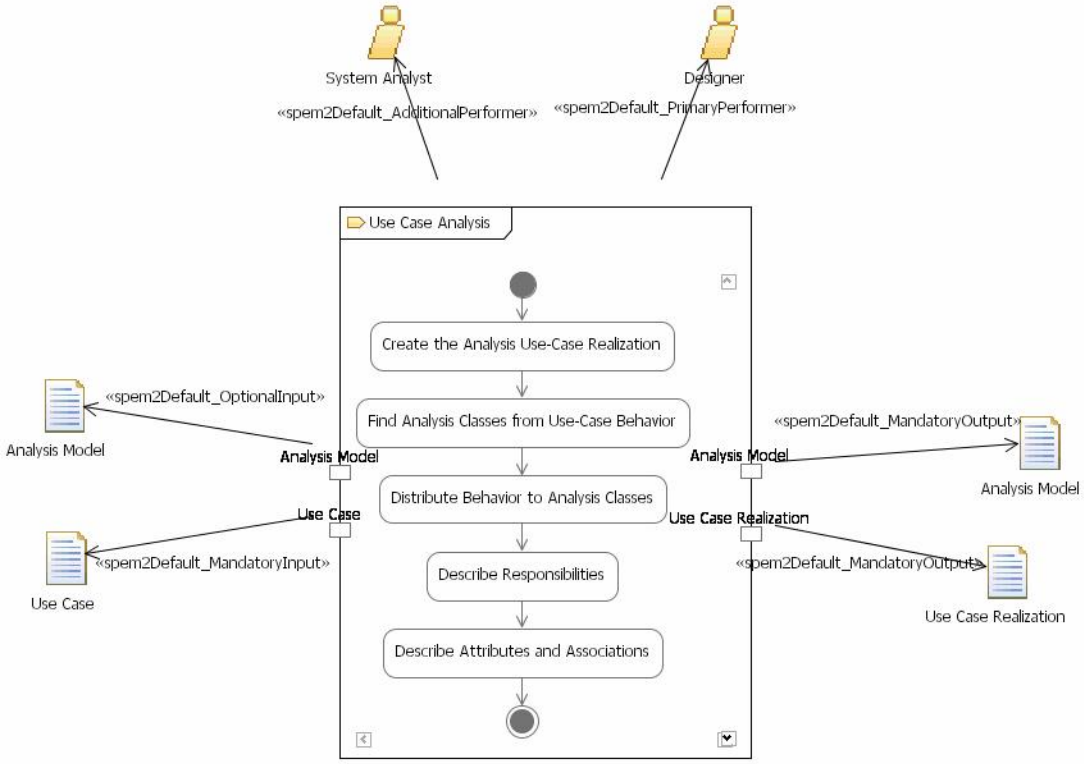




- Roles responsible for work products
  - Each work product responsibility of single role
- Process roles perform tasks
  - Each activity only performed by single role
- Work products used as inputs to tasks and tasks from activities
- "Somebody does something that changes something"

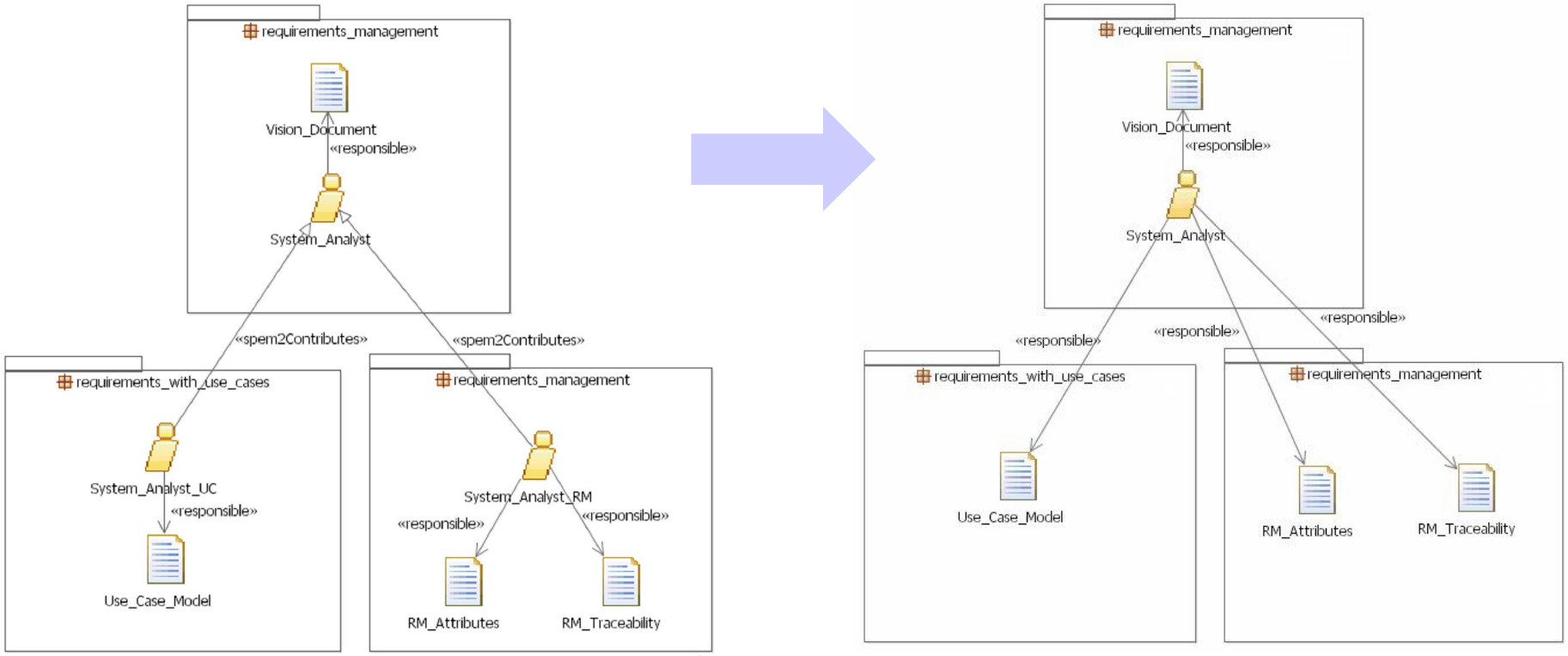
ng





ÅShow process behavior and team collaboration with UML activity diagrams

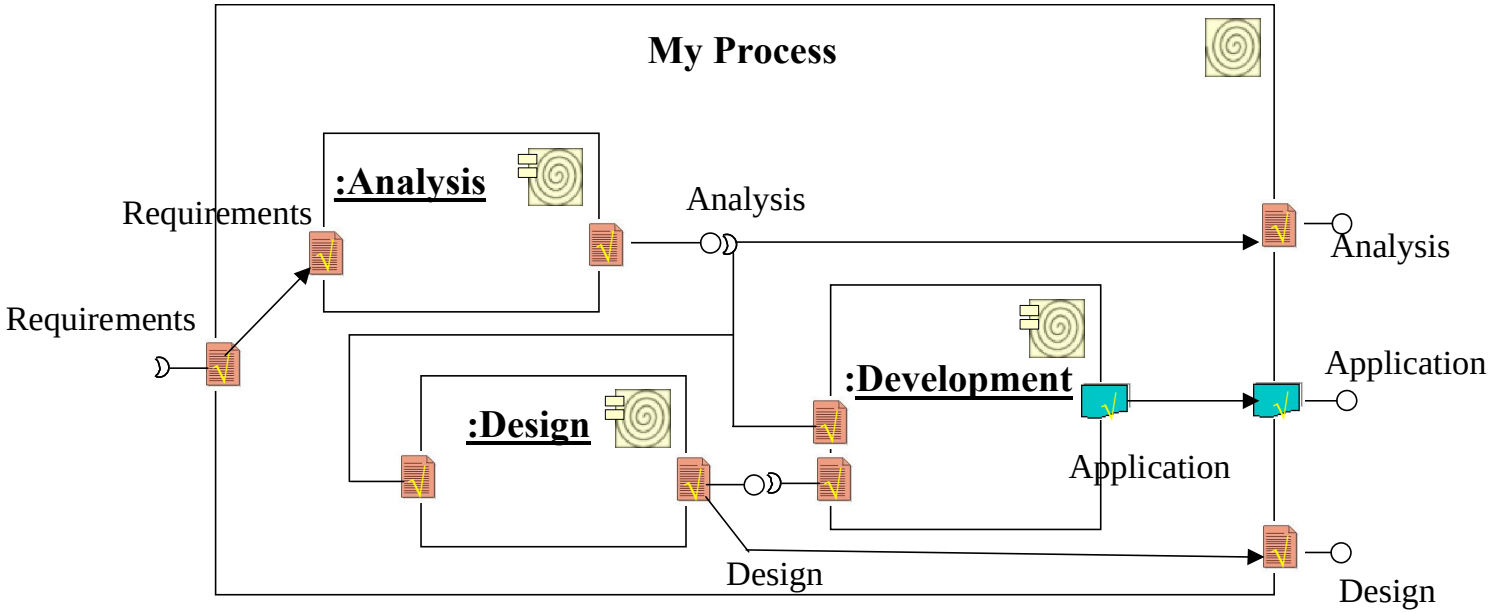
bility and Configurability



- Factoring configurable skills into separate packages
- Merges elements together during publishing
- Three kinds of variability: contributes, replace, extends

Deselecting package from configuration removes it from practice space

rocess Components



- Reusable process components – “black boxes”
- Integrated with one another via input and output work products
- Can substitute one component with another component (i.e. for different techniques or technology platforms) as long as input and outputs are the same

APG

s Patterns for Best Practices

- Revisiting design work based on same underlying pattern
- Dynamic linking of patterns increases maintainability
- Changes in patterns require zero updates

Presentation Name	Index	Model Info	Type
My Process	0		Delivery Process
Early Project Phase	1		Phase
Plan an Iteration	2	extends 'Plan an Iteration, msf-agile'	Activity
Design Work	11	extends 'Design Work, msf-agile'	Activity
Create a Scenario	*12*	*extends 'Create a Scenario, msf-agile'*	*Activity*
Create Solution Architecture	*15*	*extends 'Create Solution Architecture, msf-agile'*	*Activity*
Partition the System	*16*		*Task Descriptor*
Determine Interfaces	*17*		*Task Descriptor*
Develop Threat Model	*18*		*Task Descriptor*
Develop Performance Model	*19*		*Task Descriptor*
Create Architectural Prototype	*20*		*Task Descriptor*
Create Infrastructure Architecture	*21*		*Task Descriptor*
Intermediate Project Phase	22		Phase
Plan an Iteration	23	extends 'Plan an Iteration, msf-agile'	Activity
Design Work	32	extends 'Design Work, msf-agile'	Activity
Create a Scenario	*33*	*extends 'Create a Scenario, msf-agile'*	*Activity*
Create Solution Architecture	*36*	*extends 'Create Solution Architecture, msf-agile'*	*Activity*
Partition the System	*37*		*Task Descriptor*
Determine Interfaces	*38*		*Task Descriptor*
Develop Threat Model	*39*		*Task Descriptor*
Develop Performance Model	*40*		*Task Descriptor*
Create Architectural Prototype	*41*		*Task Descriptor*
Create Infrastructure Architecture	*42*		*Task Descriptor*
Late Project Phase	43		Phase

Many processes today are iterative, i.e. they revisit the same work. Process Patterns provide reuse, but not every iteration has the same focus….

ces When Applying Patterns

- Suppressed two tasks
- They will not be performed

- Contributed one new task
- Local addition to dynamically linked pattern

- Replaced whole activity with new breakdown
- Other pattern parts such as "Create Scenario" stays as is

Presentation Name	Index	Model Info	Type
My Process	0		Delivery Process
Early Project Phase	1		Phase
Plan an Iteration	2	extends 'Plan an Iteration, msf-agile'	Activity
Design Work	11	extends 'Design Work, msf-agile'	Activity
Create a Scenario	*12*	*extends 'Create a Scenario, msf-agile'*	*Activity*
Create Solution Architecture	15	locally contributes to 'Create Solution Architectur...	Activity
Partition the System	*16*		*Task Descriptor*
Determine Interfaces	*17*		*Task Descriptor*
Develop Threat Model	*18*		*Task Descriptor*
Develop Performance Model	*19*		*Task Descriptor*
Create Architectural Prototype	*20*		*Task Descriptor*
Create Infrastructure Architecture	*21*		*Task Descriptor*
Review Objectives	22		Task Descriptor
Intermediate Project Phase	23		Phase
Plan an Iteration	24	extends 'Plan an Iteration, msf-agile'	Activity
Design Work	33	extends 'Design Work, msf-agile'	Activity
Create a Scenario	*34*	*extends 'Create a Scenario, msf-agile'*	*Activity*
Create Solution Architecture	37	locally replaces 'Create Solution Architecture, msf...	Activity
Determine Interfaces	38		Task Descriptor
Develop Threat Model	39		Task Descriptor
Create Infrastructure Architecture	40		Task Descriptor
Late Project Phase	41		Phase

Tailored process still using dynamically linked patterns parts (green lines)
It only stores its local changes

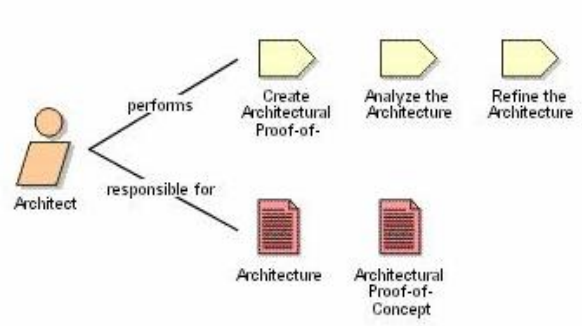
APG

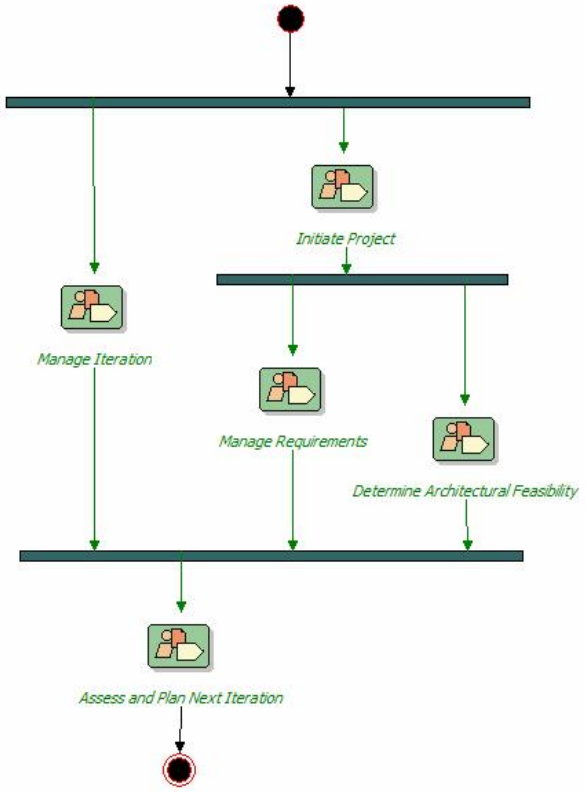
ble Processes

Role, Tasks, and Work Products

Activity Diagram

Work Breakdown Structures

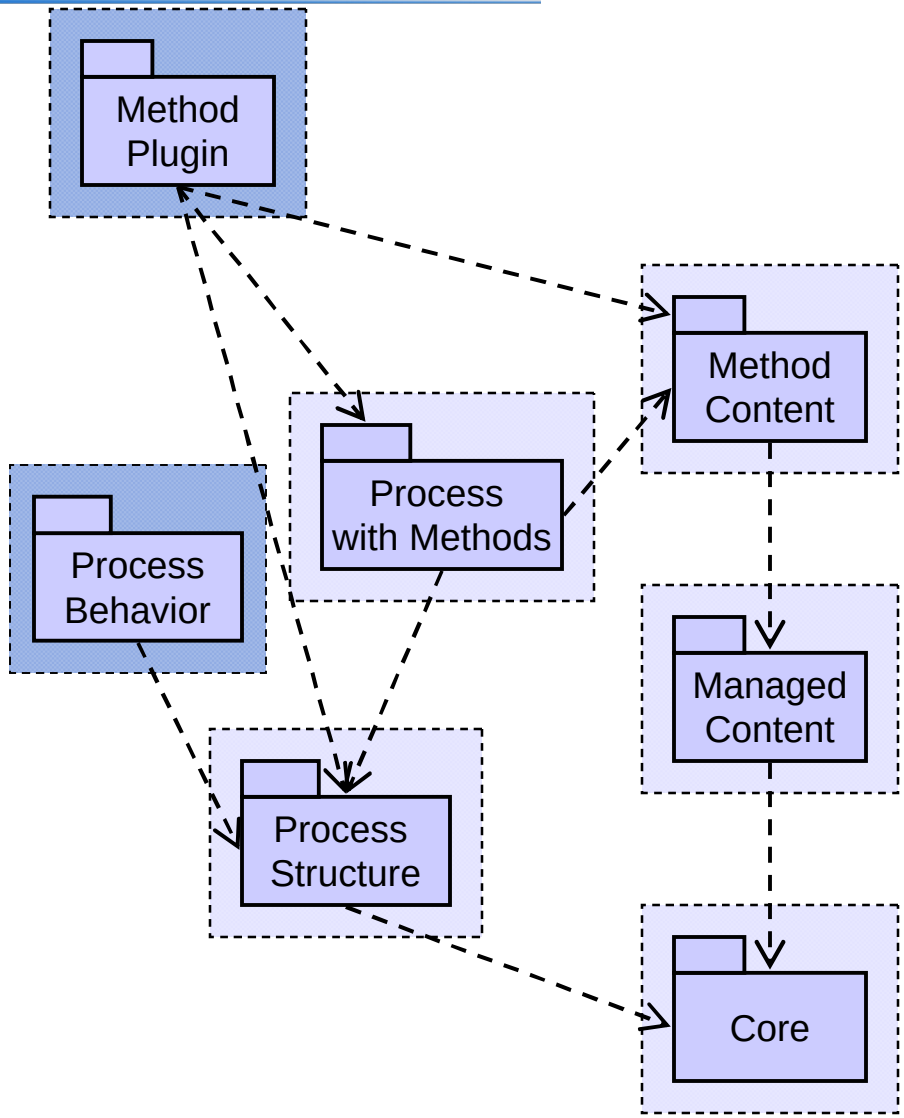




Presentation Name	Index
Basic Unified Process	0
Inception Phase - Iteration n	1
Manage Iteration	2
Initiate Iteration	3
Conduct daily meetin	4
Initiate Project	5
Define Vision	6
Plan the Project	7
Manage Requirements	8
Describe Requiremen	9
Find and Outline Actc	10
Detail Use Cases	11
Determine Architectural F	12
Analyze the Architecu	13
Create Architectural	14
Assess and Plan Next Ite	15
Assess Results	16
Prioritize Work	17
Plan Next Iteration	18
Refine Project Plan	19

APG

te



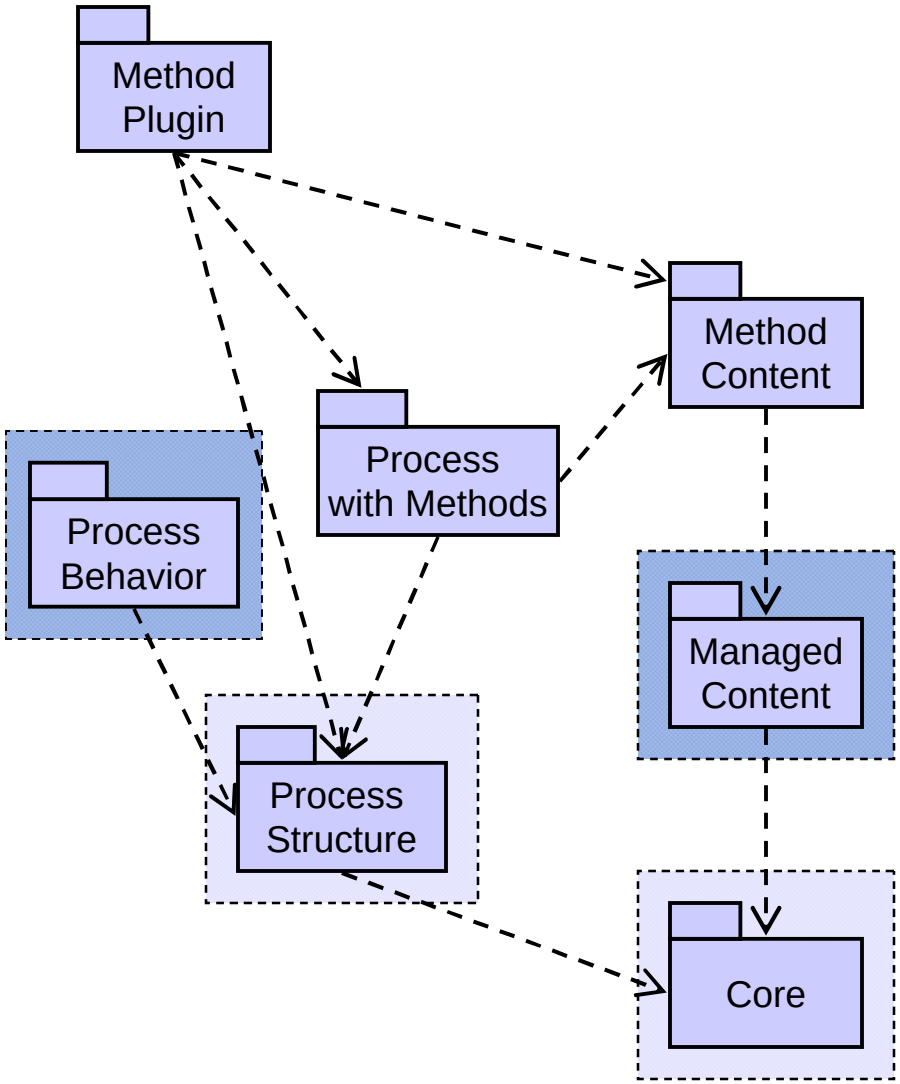
- Audience
  - Large development organizations and large scale process and method library tool providers
- Needs
  - Those who need all capabilities
  - Provide support for large scale libraries of textual method content and reusable process components
- Focus is on managing many processes for complex multi-tiered organizations that manage interrelated processes

SPEM Packages

- Method plugin
- Process behavior

APG

with Behavior and Content



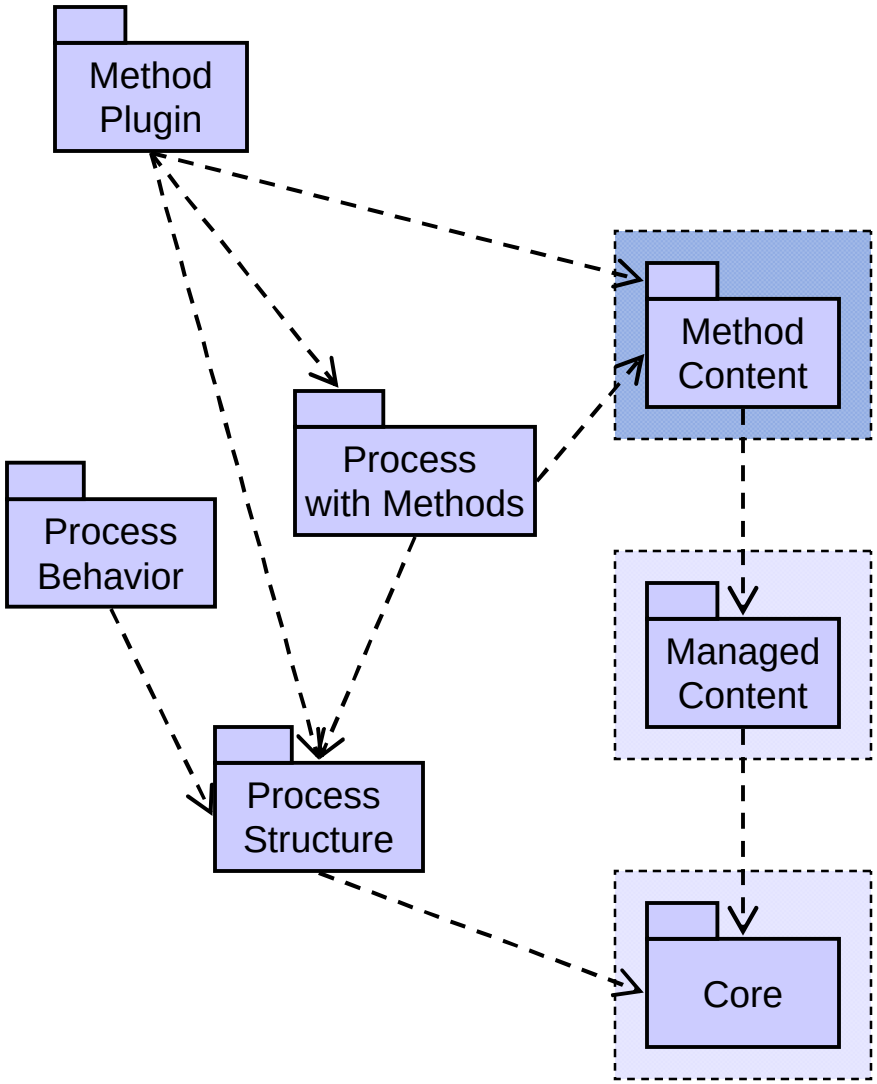
- Audience
  - Modeling focused organizations
- Needs
  - Work on one process at a time
  - Create work breakdown structures and/or workflow diagrams
- Who do not require
  - Reusable method content
  - Variability and process configuration
- Provides backwards compatibility for SPEM 1.x implementations

SPEM Packages

- Managed content
- Process behavior

APG

Content



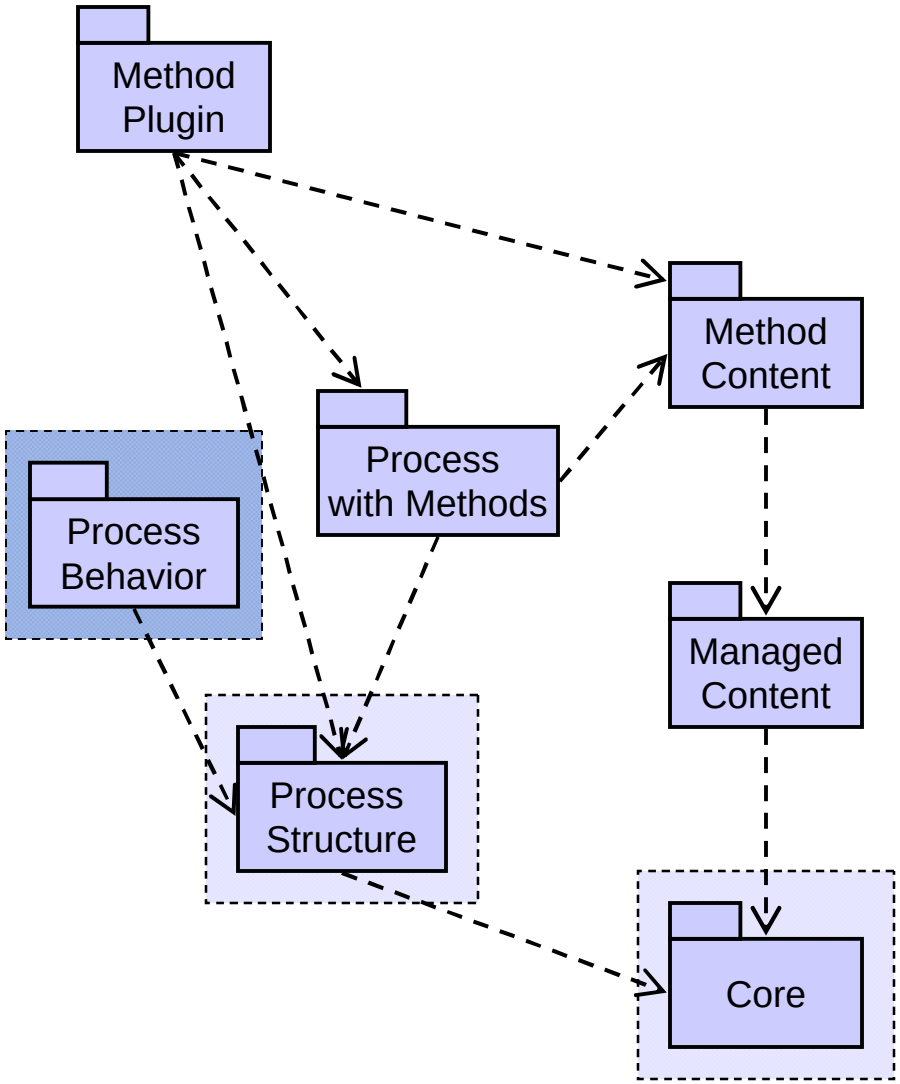
- Audience
  - Method documenter and book authors, organizational knowledge base provider
- Needs
  - Those that manage documentation of descriptions of development methods, techniques, and best practices
- Who do not require
  - Formal process models
  - Variability and process configuration

SPEM Packages

- Managed content
- Process behavior

APG

nario #1



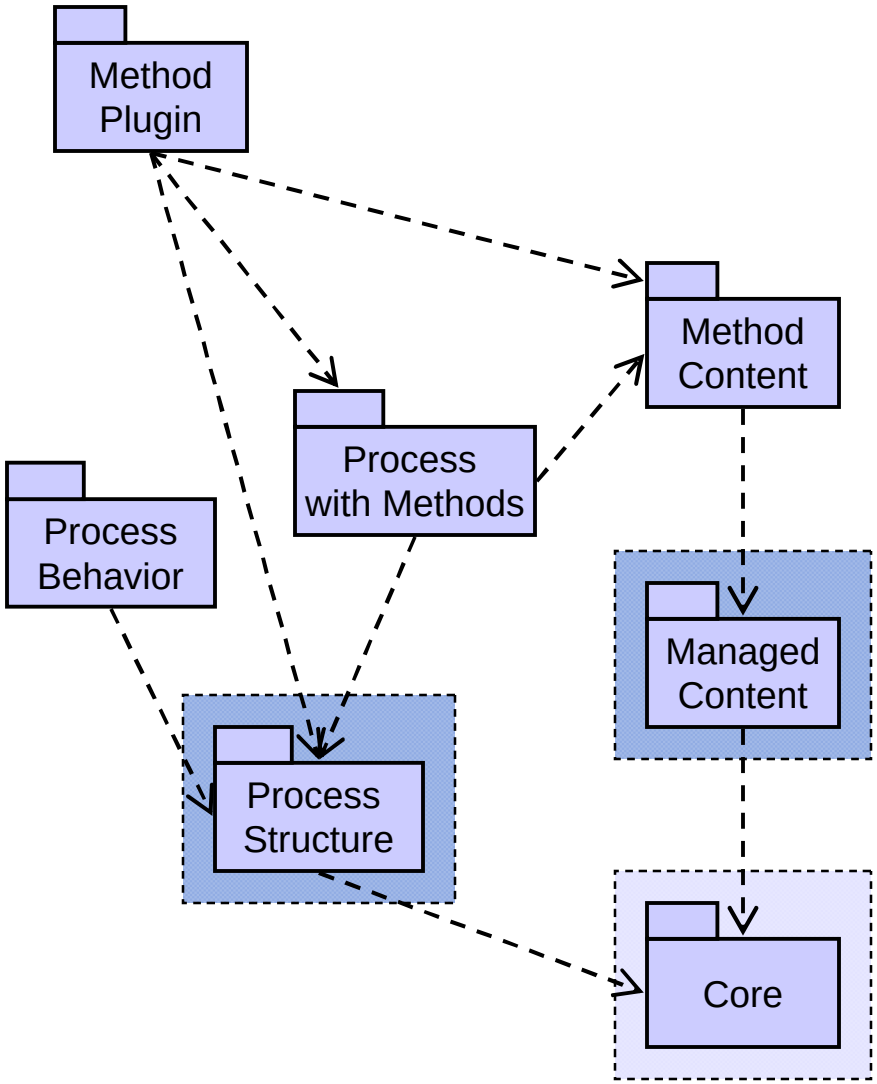
- Audience
  - Modeling focused organizations
- Needs
  - Create work breakdown structures and/or workflow diagrams
  - Minimal supplemental narrative
- Who do not require
  - Natural language guidance
  - Reusable method content
  - Variability and process configuration

SPEM Packages

- Process behavior

APG

nario #2



- Audience
  - Work breakdown structure focused organizations
- Needs
  - Create work breakdown structures only
  - Provide natural language guidance
- Who do not require
  - Formal process models
  - Reusable method content
  - Variability and process configuration

SPEM Packages

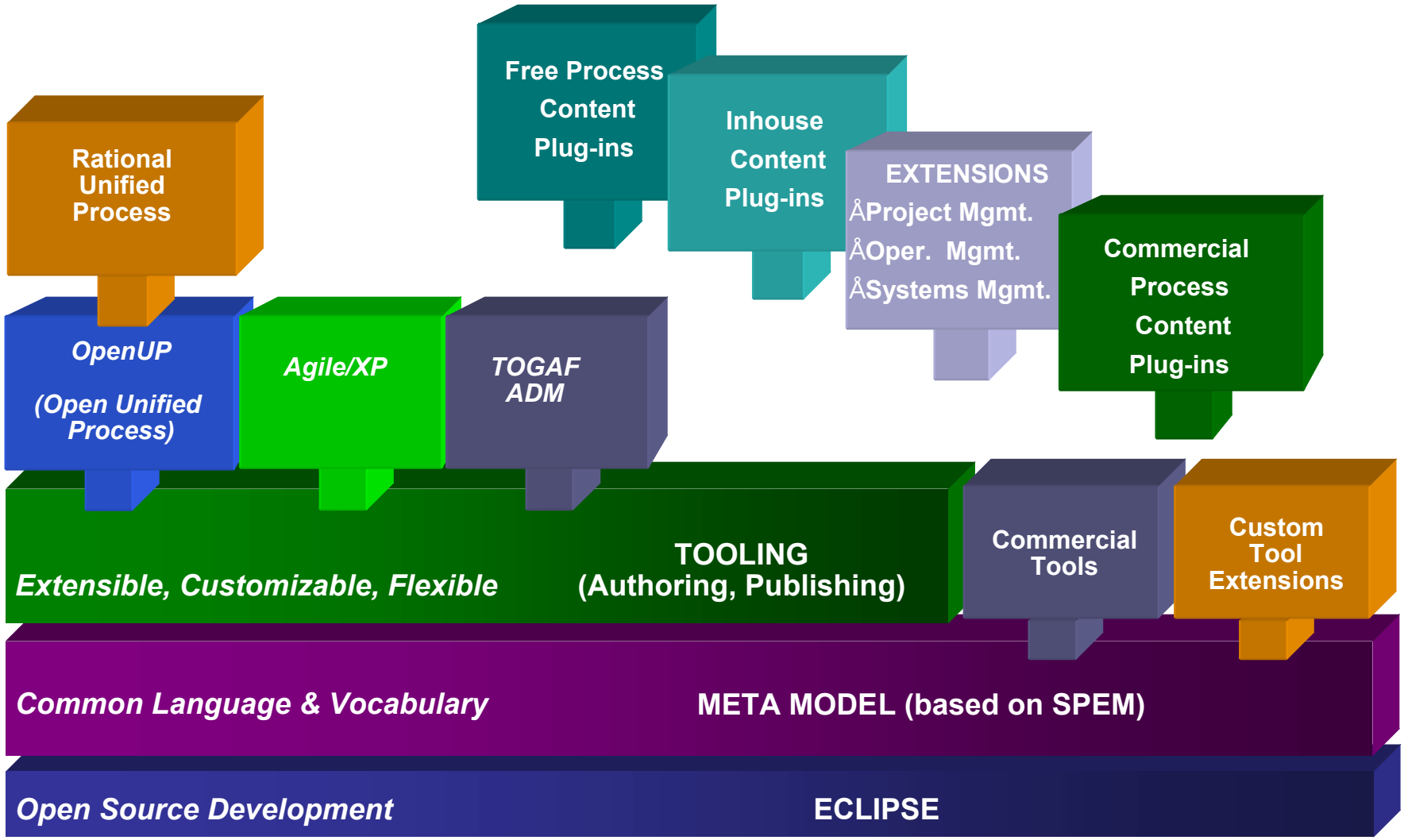
- Process structure
- Managed content

ss Framework

- New Eclipse Foundation project
- Provide an extensible framework and exemplary tools and content for software process engineering
- Started in January 2006 with 16 committers
  - Have had many face-to-face meetings in US and Europe
  - Many special interest groups (SIG) aligned with process content and tools
- Completed first official, public release in October 2006
- Visit project website at www.eclipse.org/epf

oals

- Extensible framework
  - Meta-model based on OMG's Software and Systems Process Engineering Metamodel (SPEM)
  - Core extensible process tooling framework
- Exemplary and extensible tools
  - Method and process authoring
  - Library management and content extensibility
  - Configuring and publishing
- Exemplary and extensible process content
  - Iterative, agile, and incremental development
  - Applicable to a broad set of development platforms and applications



?

Requires:
- Realistic consistency
- Viable governance
- Improved ROI

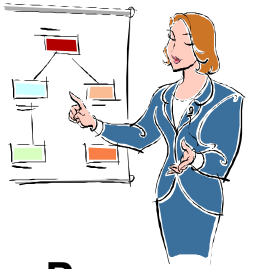
Management

Produces:
- Base methods
- Plug ins

Process Author

Desires:
- Simplicity
- Templates
- Examples
- Guidance

Professional



Performs:
- Tailoring
- Publishing
- Support
- Training

Process Coach

Provides:
- Training
- Consulting
- Mentoring
- Adoption services

Service Provider

Wants to:
- Build tools
- Sell tools
- Sell services

Tool Provider

Needs:
- Teachable material
- Teach process development
- Use in student projects
- Bring research to mainstream

Academia

APG

en Unified Process (OpenUP)

- A process framework united by a set of core principles
- Application of an **iterative lifecycle** that mitigates risk early and often, and shows results early and often
- Focus on the **collaboration** within a development team including the product stakeholders to maximize results
- Management of **requirements** in a form that represents stakeholder value and drives the development process
- Cognizance of **architecture** as a means to increase quality and technical understandability

UP/Basic?

- An iterative software development process
- Minimal – only fundamental content is included
- Complete – can be manifested as an entire process to build a system
- Extensible – can be used as a foundation on which process content can be added or tailored as needed

"The least amount of process for every project; but not all of the process for all projects"

r Demonstration

- View method plug-in (OpenUP/Basic)
- View method content (role, task, work product)
- View process configuration
- Create new method plug-in
- Extend existing method content
- Add new method content
- Publish process
- View published website
- Export work breakdown structure

Questions/Discussion

Thanks for your attention and participation!

Armstrong Process Group, Inc.
www.aprocessgroup.com

APG