7th Annual CMMI® Technology Conference

Formal Process Definition with Industry Standards

Armstrong Process Group, Inc.
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Objectives

- 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
What Development Teams Are Facing Today

- 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
What Organizations 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
Processes arranged in a “list” fashion – no easy way to navigate and use processes – “difficult to follow the trail of breadcrumbs!”
Process Integration 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
Industry – Process Management

1970s & 1980s – Three-Ring Binders
- Demonstrated organization commitment
- Often became shelfware

1990s – Websites
- More accessible by practitioners
- Often difficult to navigate and maintain

2000s – Model-Driven
- Access to industry standard frameworks
- Integration of multiple lifecycles
- Formal process asset management

2007
Standardize representation and manage libraries of reusable **Method Content**

- JUnit user guidance
- Content on J2EE
- Configuration mgmt guidelines
- Lessons learnt from previous project and iteration
- Corporate guidelines on compliance

**Configure** a cohesive process framework customized for my project needs

Create project plan templates for **Enactment** of process in the context of my project
Systems 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
Managed Content – 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
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”
Show process behavior and team collaboration with UML activity diagrams
Process Variability 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"
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
Revisiting design work based on same underlying pattern
Dynamic linking of patterns increases maintainability
Changes in patterns require zero updates

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

<table>
<thead>
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<th>Type</th>
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<tr>
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<td>extends 'Design Work, msf-agile'</td>
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<td>Create Solution Architecture</td>
<td>12</td>
<td>extends 'Create a Scenario, msf-agile'</td>
<td>Activity</td>
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<td>Partition the System</td>
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<td>locally contributes to 'Create Solution Architecture'</td>
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- Tailored process still using dynamically linked patterns parts (green lines)
- It only stores its local changes
**Item 1**
- Audience
  - Large development organizations and large scale process and method library tool providers

**Item 2**
- Needs
  - Those who need all capabilities
  - Provide support for large scale libraries of textual method content and reusable process components

**Item 3**
- Focus is on managing many processes for complex multi-tiered organizations that manage interrelated processes

**Item 4**
- SPEM Packages
  - Method plugin
  - Process behavior
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
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
Scenario #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
Scenario #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
Eclipse Process 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
EPF Project Goals

- 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
**EPF Overview**

**Free Process Content Plug-ins**

**META MODEL (based on SPEM)**

**ECLIPSE**

**TOOLING** (Authoring, Publishing)

- **OpenUP** (Open Unified Process)
- **Agile/XP**
- **TOGAF ADM**
- **Commercial Tools**
- **Custom Tool Extensions**

**EXTENSIONS**

- Project Mgmt.
- Oper. Mgmt.
- Systems Mgmt.

**Commercial Process Content Plug-ins**

**Inhouse Content Plug-ins**

**Extensible, Customizable, Flexible**

**Common Language & Vocabulary**

**Open Source Development**
Professional

Requires:
- Realistic consistency
- Viable governance
- Improved ROI

Desires:
- Simplicity
- Templates
- Examples
- Guidance

Who Uses EPF?
- Process Author
- Management
- Service Provider
- Professional
- Process Coach
- Tool Provider
- Academia

Process Author

Produce:
- Base methods
- Plug ins

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

Service Provider

Provides:
- Training
- Consulting
- Mentoring
- Adoption services

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

Tool Provider

Process Coach

Performs:
- Tailoring
- Publishing
- Support
- Training

Academia

Management
Open 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
What Is OpenUP/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”
EPF Composer 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!

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