Extending SPEM For Distributed Software Development Projects

Moving Forward To SPEM 3.0 ?

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Agenda

- **SPEM: What Is In The Current Version**
- **SPEM: What Is NOT In The Current Version**
- **Proposed Solutions**

UML Profiles

- Domain specific extensions of UML
- Defined through standard extension mechanisms of UML
- Some are standardized by OMG
  - UML Profile for CORBA
  - UML Testing Profile
  - Software Process Engineering Metamodel
  - ...

Software Process Engineering Metamodel

This metamodel is used to describe a concrete software development process or a family of related software development processes

Software Process Engineering Metamodel Specification

Conceptual Model

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Role

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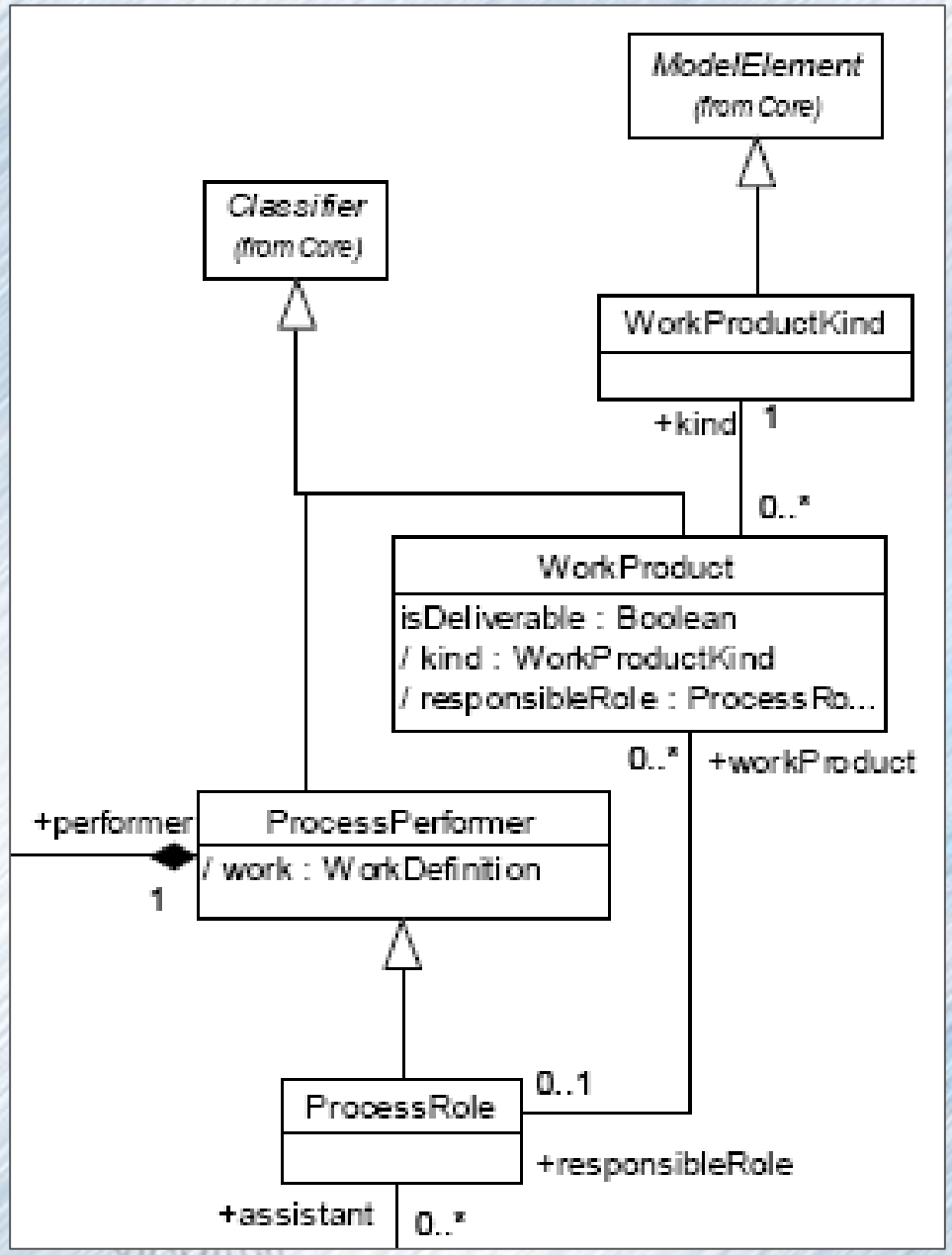
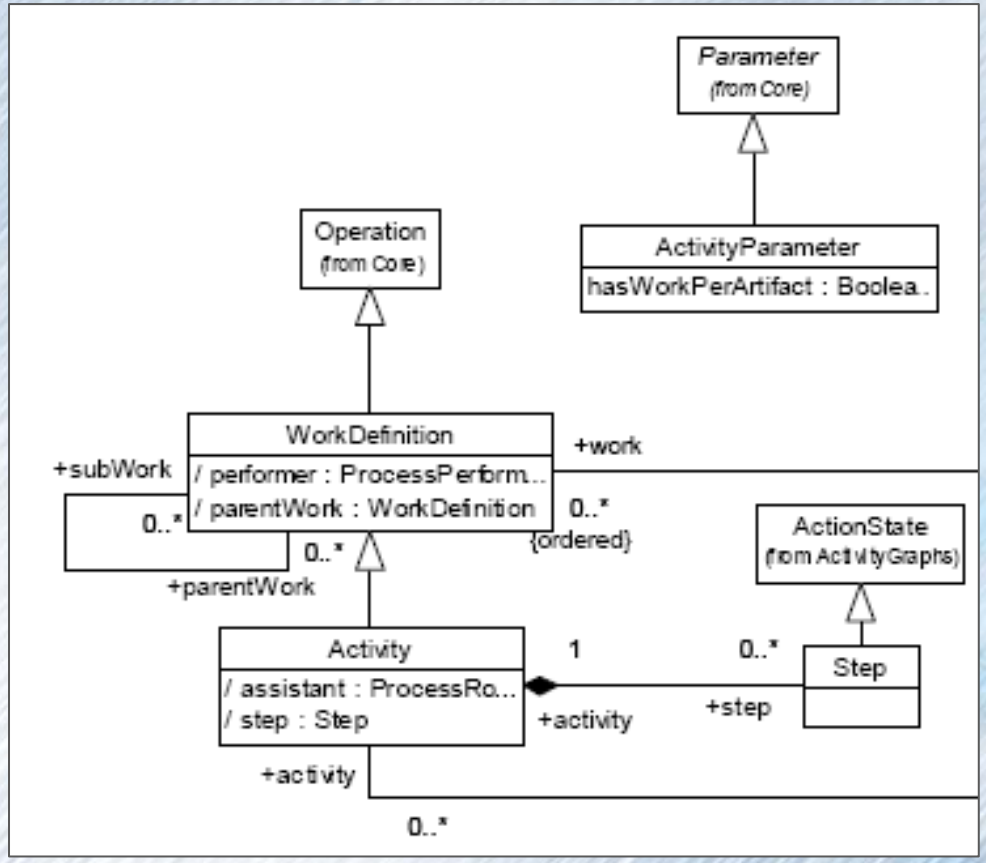
Main Areas

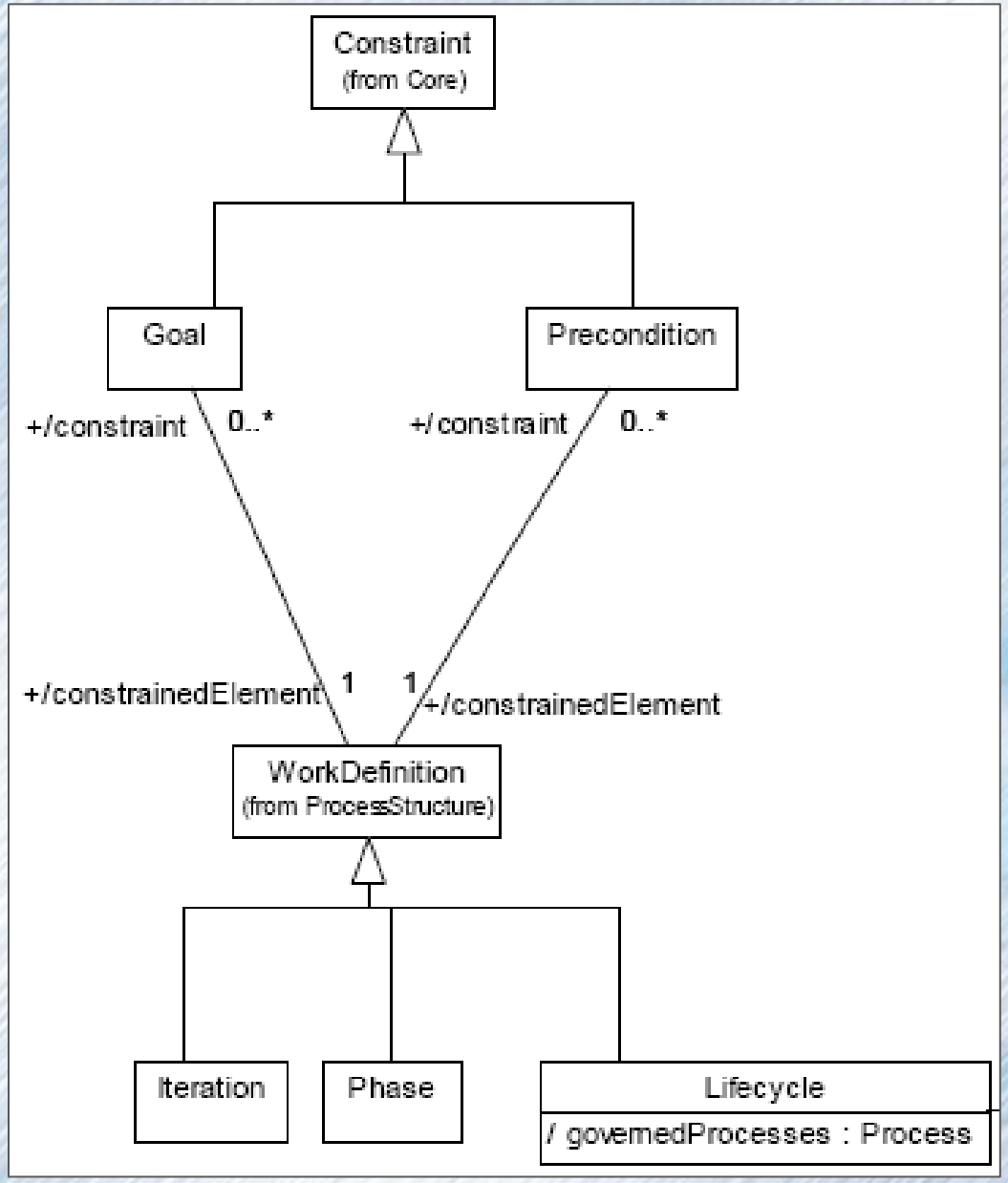
- Team structure
  - ProcessRole, ProcessPerformer
- Workflow
  - Activity, Step, WorkDefinition, ...
- Process Artifacts
  - WorkProduct, Document



- **ProcessPerformer**
  - Represents abstractly the "whole process" or one of its components
- **ProcessRole**
  - Defines responsibilities over specific WorkProducts, and defines the roles that perform specific activities
- **WorkProduct**
  - A work product or artifact is anything produced, consumed, or modified by a process. It may be a piece of information, a document, a model, source code, and so on



- **WorkDefinition**
  - The most abstract class that describes the work performed in the process
- **Activity**
  - Piece of work performed by one ProcessRole
- **Step**
  - Atomic element of Activity



- **LifeCycle**
  - Sequence of phases to achieve specific goal
- **Phase**
  - Part of process with entry / exit criteria
- **Iteration**
  - Composite WorkDefinition with minor milestone

SPEM Essentials

- Can be used to define roles, responsibilities and artifacts
  - via associations of Process Roles with Activities and WorkProducts
- Can be used to define WBS
  - via composition of WorkDefinition descendants (LifeCycle, Phase, Iteration)

Automated Process Engineering

- Rational Unified Process
  - Rational Process Workbench
- Microsoft Visual Studio Team System
  - Process templates
  - Can be used to enact *any* process
  - IRIS Process Author
    http://www.osellus.com/scenarios/iris_vs2005.html

More Information

- **OMG Unified Modeling Language Specification v 1.6**
  - http://www.omg.org/technology/documents/formal/uml.htm
- **Software Process Engineering Metamodel Specification v 1.1**
  - http://www.omg.org/technology/documents/formal/spem.htm

Tools That Support SPEM

- Enterprise Architect
  - http://www.sparxsystems.com.au
- Objecteering/UML
  - http://www.objecteering.com

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How Do We Define The Geographical Structure Of A Project?

- Can we specify that the project is performed by team distributed over several sites / offices / locations?
- Can we specify that we want some particular phases and / or activities to be performed at some particular sites?
- Can we specify that we want some particular artifacts to be created on some particular sites?
- Can we specify that we want some roles to be located on some particular sites?

Where Is The Time Dimension?

- Can we define time-specific constraints for a project?
- Can we explicitly define a strategy of integration between organization-level processes and project-level processes from time-management perspective?

How Can We Specify Process Patterns?

- A Pattern is a description of a general solution to a common problem or issue from which a detailed solution to a specific problem can be determined
- A Process Pattern is a specific Pattern created for, employed within or defined in terms of Software Process Engineering domain
- Is SPEM expressive enough to be used to define generic process patterns?

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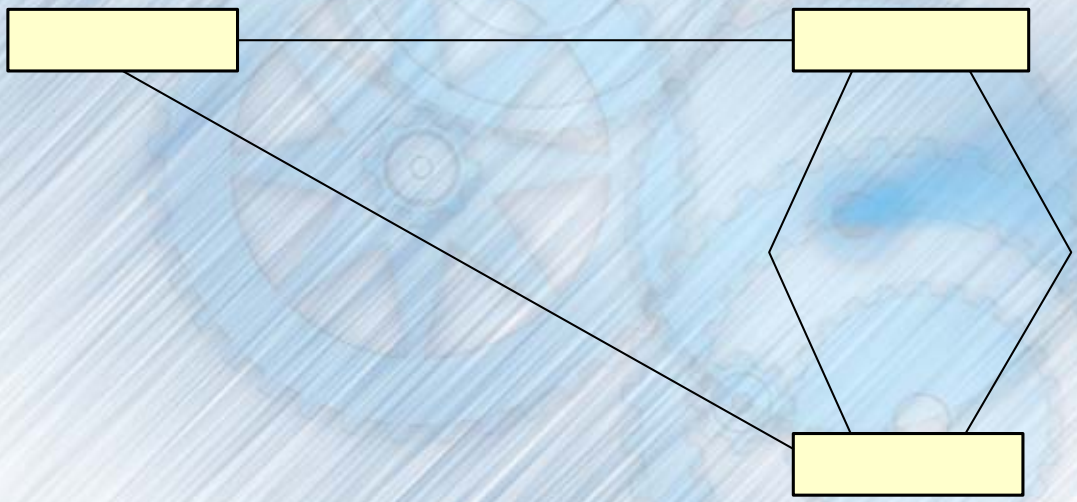
Current Conceptual Model



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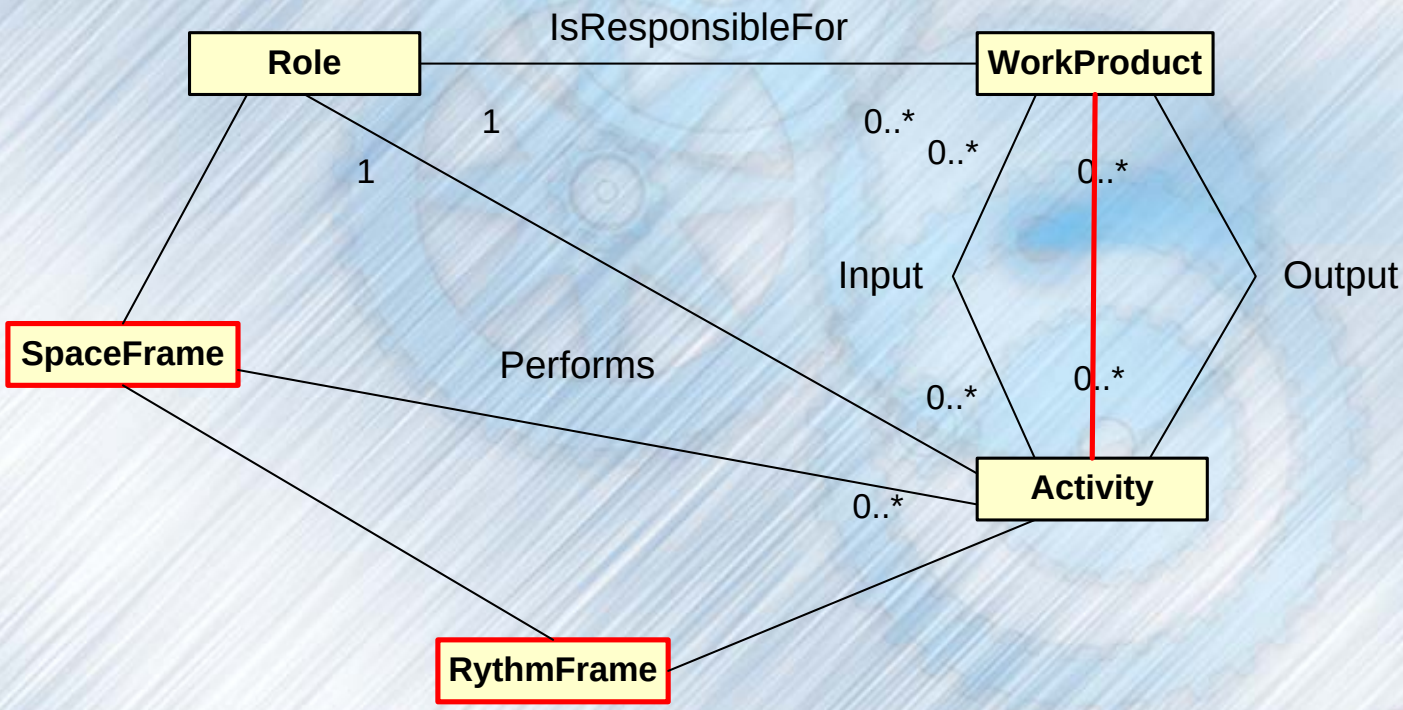
Proposed Conceptual Model (SPEM 3.0 ?)



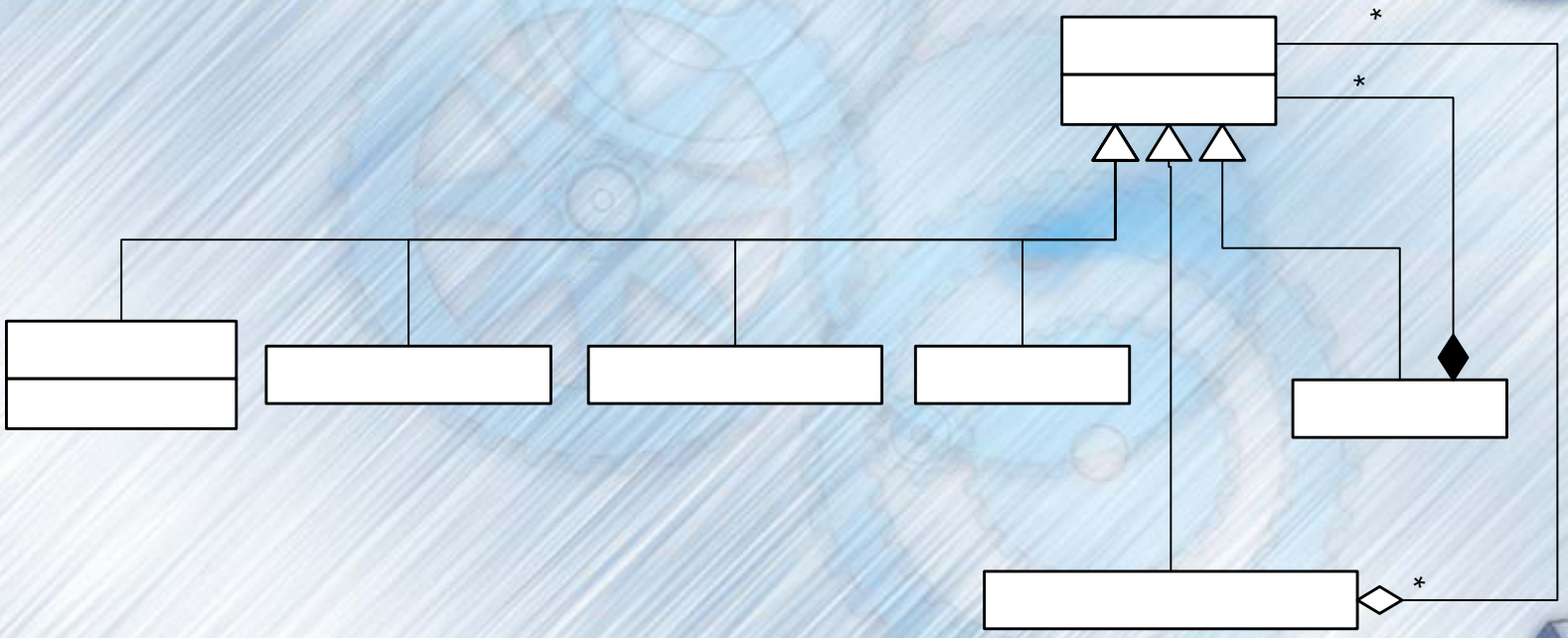
Major Improvement Areas

- "Space" dimension added
- "Time" dimension added
- "Updates" relation is not equal to the sum of "Uses" and "Produces" relations
- "Composite" pattern as a unified means of managing complexity

“Project Space” Samples

- PhysicalSite
  - Business Center
- Bridge
  - Phone conference
  - Video conference
- InformationServer
  - SharePoint Server
- CompositeSpaceFrame
  - Phone bridge + conference room(s) with polycom(s)
- Cubicle
  - Desk + chair

SpaceFrame Detailed



Artifacts Are Updated More Often, Than Created…

- SPEM 1.1 supports 2 types of associations between Activity and Work Product
  - Produces
  - Uses
- In theory we do not need to have an “updates” association
  - updates = uses old version of an artifact to produce new one
- In the “real world” an “updates” association is a vital part of process modeling
  - So, it must be included into the metamodel

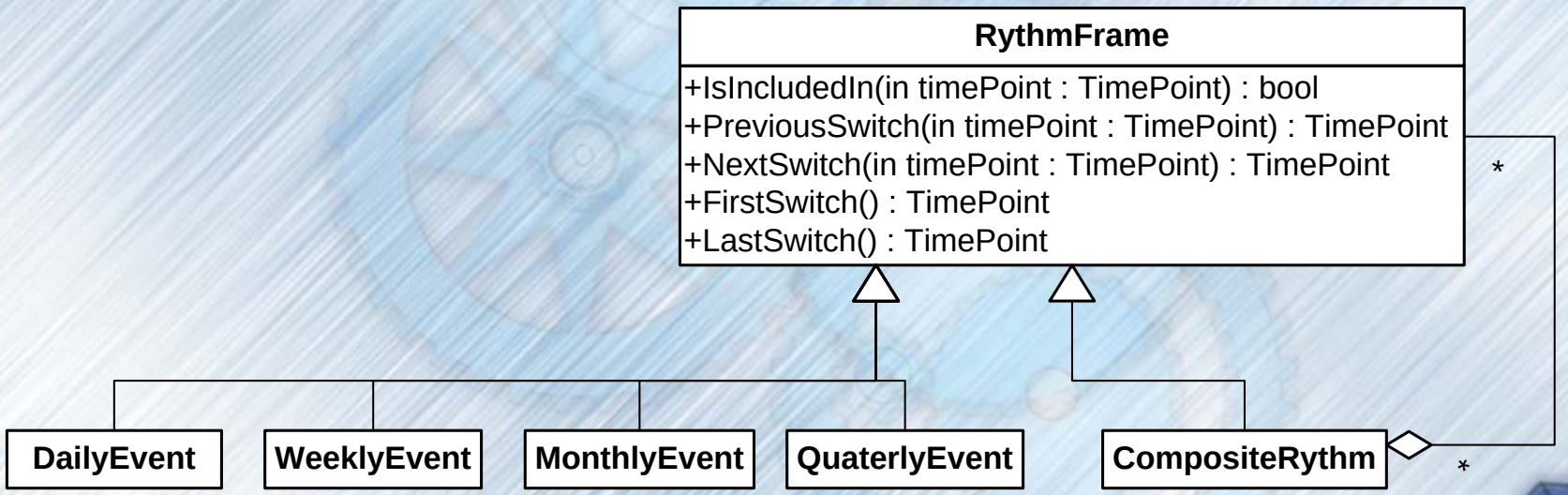
Time in “SPEM World” vs. “Real World”

- In “SPEM-1.0 World” project activities are performed as sequential atomic steps
- In “Real World” project activities are often performed as a rhythmic semi-parallel processes

“Real World” Examples

- Daily “war” meetings
- Daily builds
- Bi-weekly risk risk-management meetings
- Bi-weekly Change Control Board meetings
- Queerly budgeting meetings
- Yearly strategy review meetings
- Etc…

RythmFrame Detailed



Summary

- Current version of SPEM allows to define processes in terms of roles, activities and artifacts
- Proposed SPEM extensions allow to capture space-related and time-related process characteristics
- Authors seek for feedback from conference participants
  - The discussed SPEM extensions are supposed to become a basis for proposal to modify the current SPEM standard
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You can download this presentation from http://www.secr.ru or http://www.vlpavlov.com