Supporting Situational Method Engineering with ISO/IEC 24744 and the Work Product Pool Approach

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Overview

- Motivation
- The ISO/IEC 24744 standard metamodel
- Theoretical aspects
- Methodology usage
- Final reflections
Motivation and Context

- Method engineering is not mainstream
- Lack of consensus in academia
- Lack of pragmatic results in industry

- Let’s agree on a theoretical foundation
- Let’s provide exploitation mechanisms

ISO/IEC 24744
Software Engineering Metamodel for Development Methodologies
What Does “Metamodel” Mean?

- A model of methodologies
- A DSL where the domain is development methodologies
- An “ontology” with some implementation details
- A shared language for the description of methodologies and endeavours
- Like OMG’s SPEM, but better

Scope of ISO/IEC 24744

“when” and “what” are specified separately

people are first-class elements

modelling is integrated with process
Scope Comparison

High-Level View

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Theoretical Aspects
Establish a solid conceptual foundation for method engineering

Strict Metamodelling

- OMG’s worldview is a hypothesis that has been repeatedly falsified

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Some Examples

communities define the organisation

Alternative Organisation

representation relationships
Challenge: capture the fact that all the work products created during the application of any methodology must have a version number

Attempt Using a Strict Approach

breaks strictness

can’t standardise
Different work products are used and modified by different work units in different manners.

E.g. source code is created by developers when writing code, and then possibly changed during unit testing, which, in addition, creates defect reports.
Attempt Using I/O Metaphor

Product \[\text{input} \rightarrow \text{Task} \rightarrow \text{output} \rightarrow \text{Product}\]

Code \[\text{input} \rightarrow \text{Unit Test} \rightarrow \text{output} \rightarrow \text{Defect Report} \rightarrow \text{Code}\]

*are these the same thing?*

Using ISO/IEC 24744

Unit Test \[\text{R} \rightarrow \text{Code} \rightarrow \text{Defect Report} \rightarrow \text{Unit Test}\]

Unit Test \[\text{M} \rightarrow \text{Code} \rightarrow \text{Defect Report} \rightarrow \text{Unit Test}\]

*very different semantics*
Methodology Usage
Provide attractive tools and techniques for practitioners

Enactment

WORKFLOW APPROACH
- Process is the focus
- Work-breakdown structure
- Highly prescriptive
- Big-bang enactment

OUR APPROACH
- Products are the focus
- Purpose dependencies
- Opportunistic
- Just-in-time enactment
Specification of a Methodology

The Work Product Pool

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Lifecycle of the Pool

Tasks as Microprocesses

tasks operate on work products
Determining Candidate Tasks

- User doing enactment has the correct role
- Organisation is at the appropriate capability level
- Necessary work products are available
  - Exist
  - Action preconditions are met

Tool Support
Underlying Technology

- ISO/IEC 24744 represents the endeavour as well as the methodology
- Rich semantics for product/process interaction

Final Reflections

- Methodologies and endeavours are complex entities
- We need a rich, rigorous modelling infrastructure (powertype patterns, clabjects)
- Enactment is crucial if ME is to be adopted by industry
- ISO/IEC 24744 provides an abstract, generic “ontology”