

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

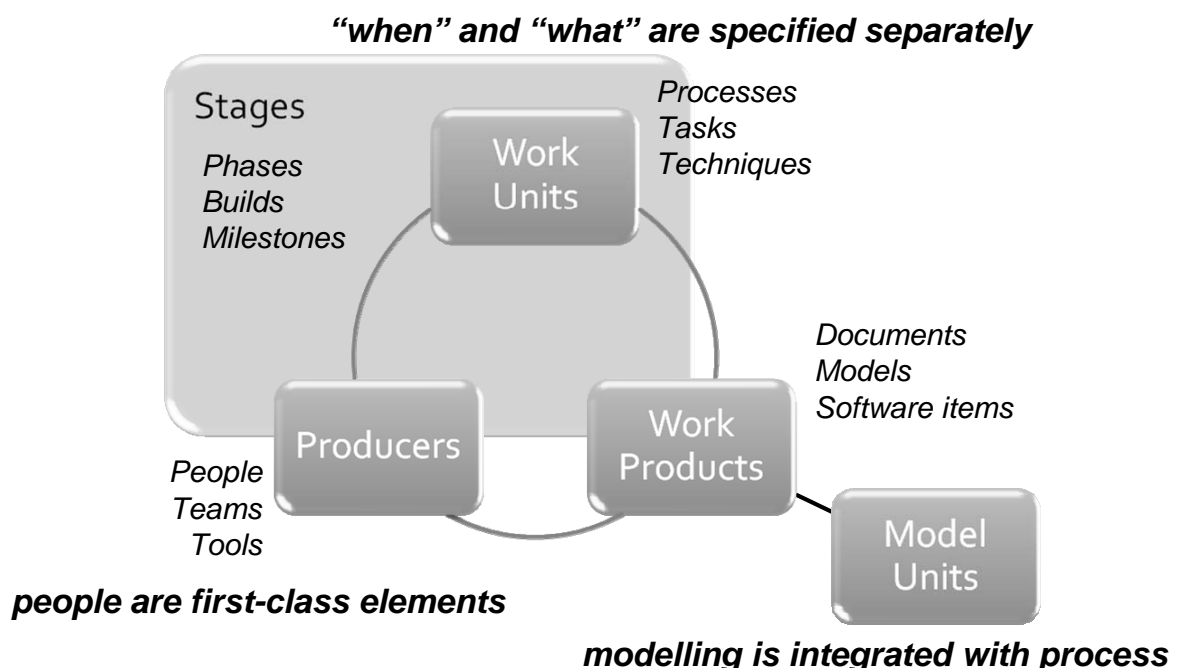
ISO/IEC 24744

Software Engineering Metamodel for Development Methodologies

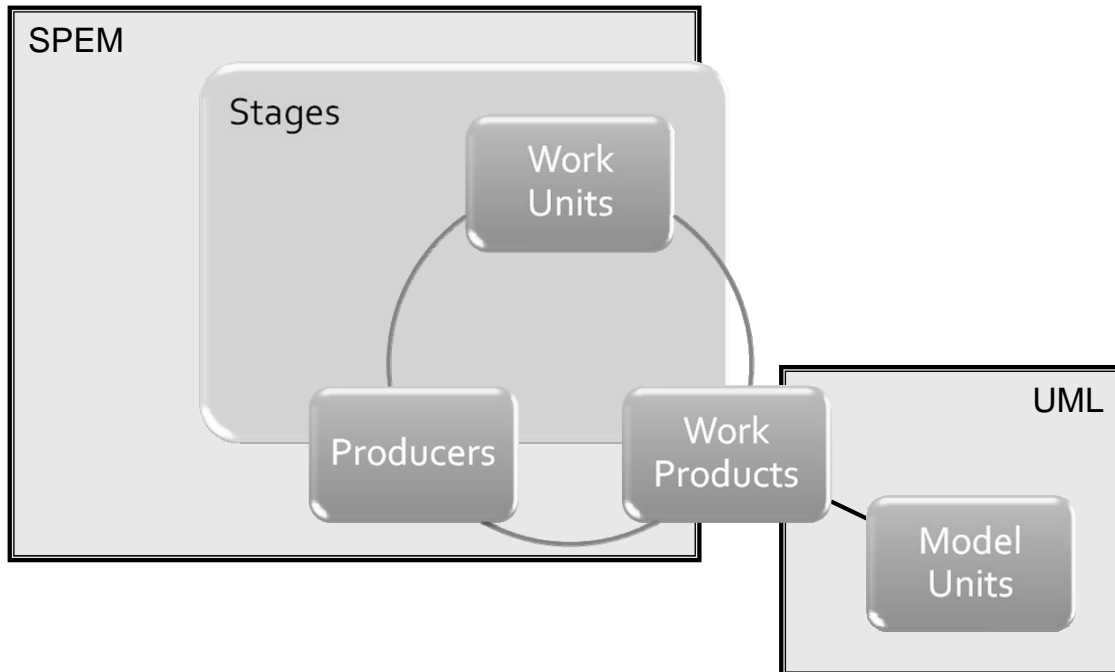
What Does “Metamodel” Mean?

- 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

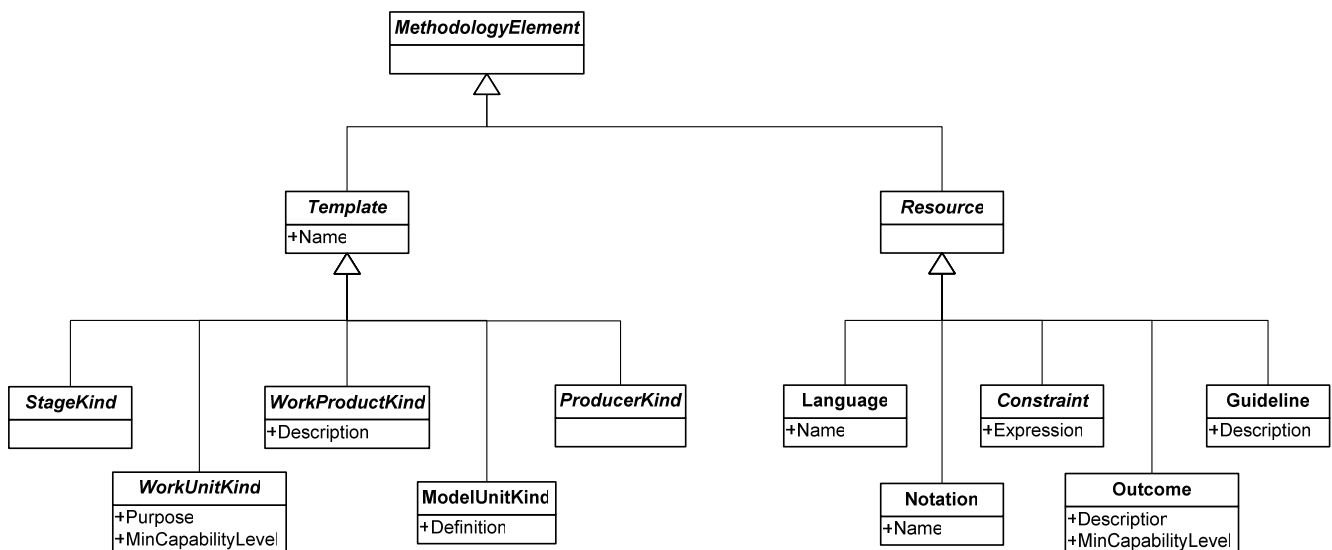
Scope of ISO/IEC 24744



Scope Comparison



High-Level View



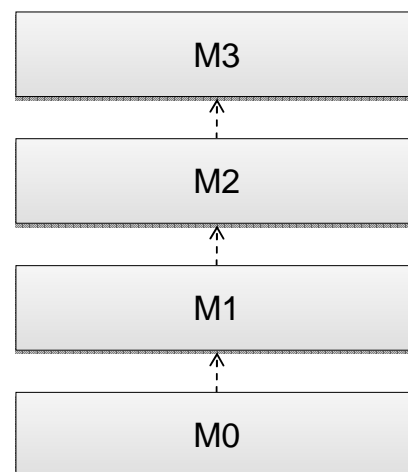
Theoretical Aspects

Establish a solid conceptual foundation for method engineering

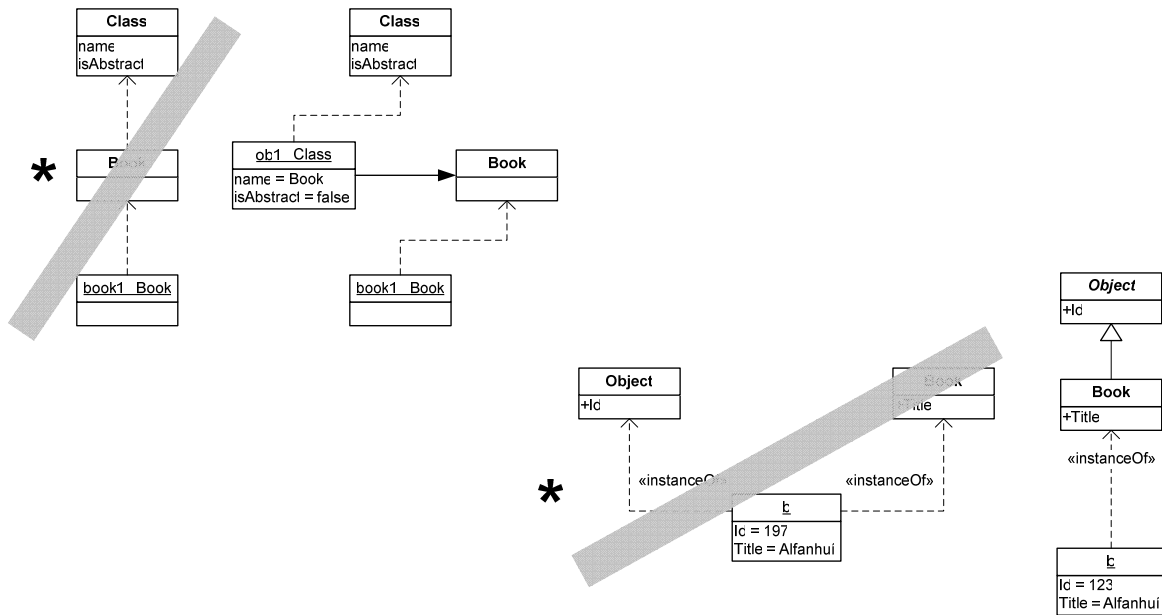
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Strict Metamodelling

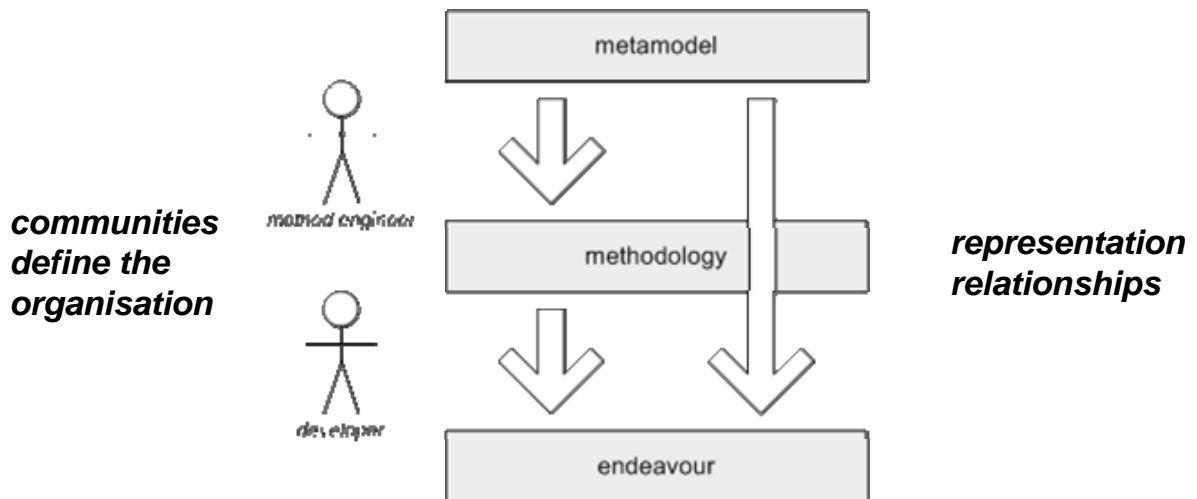
- OMG's worldview is a hypothesis that has been repeatedly falsified



Some Examples



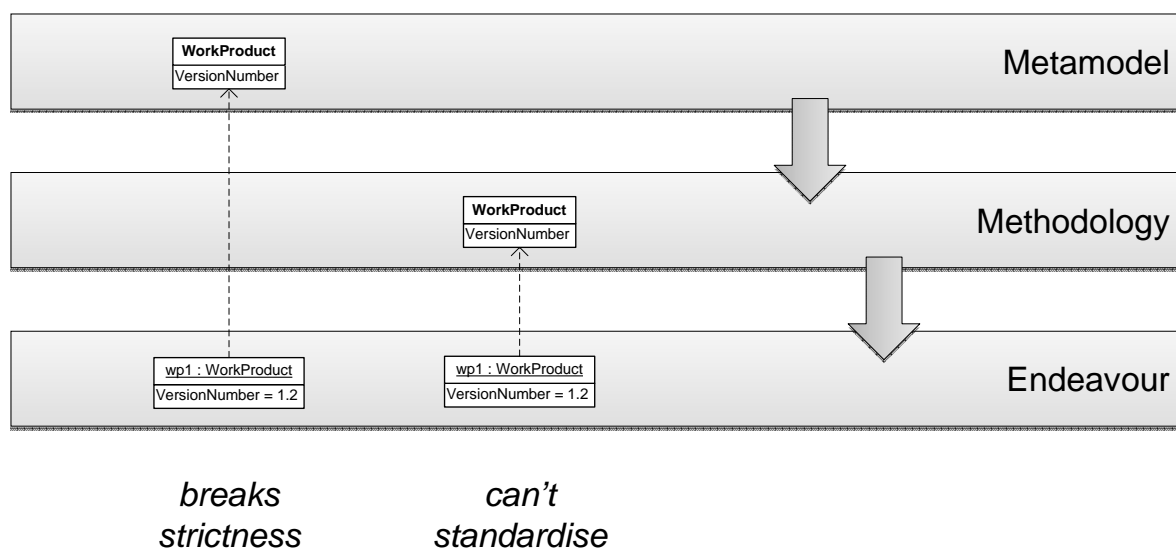
Alternative Organisation



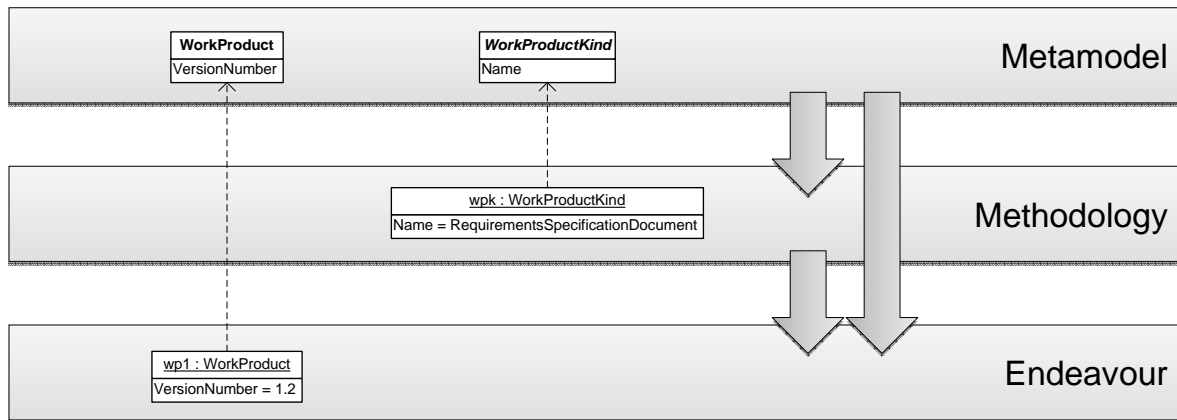
Dual-Layer Modelling

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

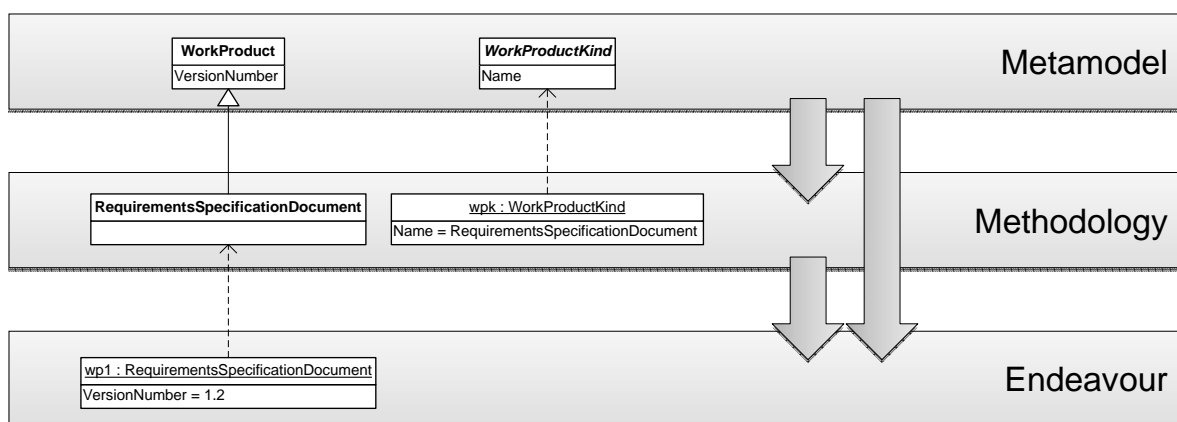
Attempt Using a Strict Approach



Using ISO/IEC 24744

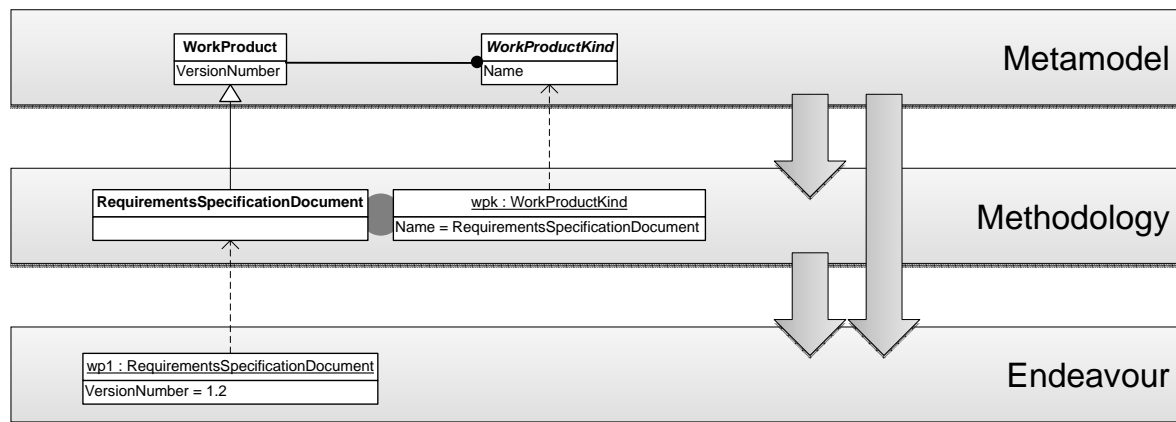


Kinds



Formalising Concepts

partitioned type + *powertype* = *powertype pattern*

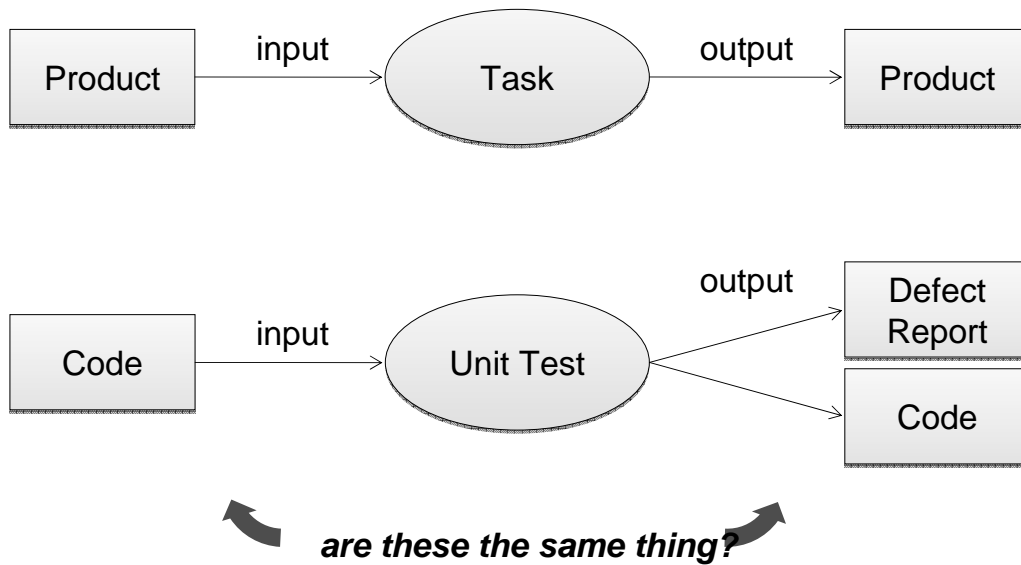


class + *object* = *clobject*

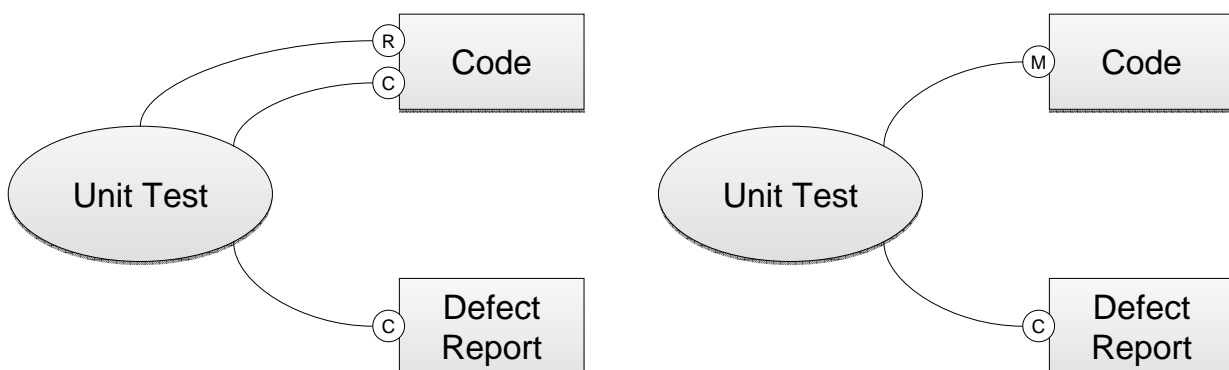
Linking Product and Process

- 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



Using ISO/IEC 24744



very different semantics

Methodology Usage

Provide attractive tools and techniques for practitioners

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Enactment

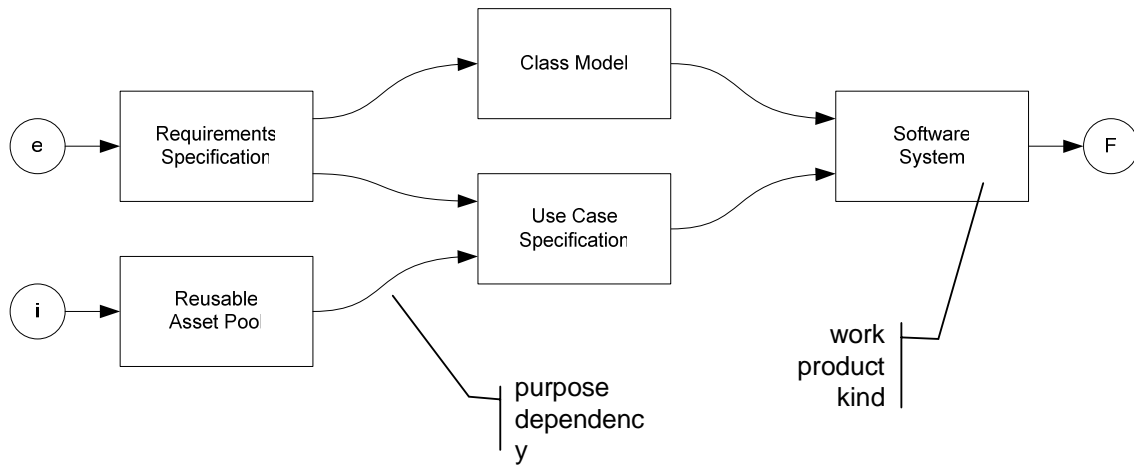
WORKFLOW APPROACH

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

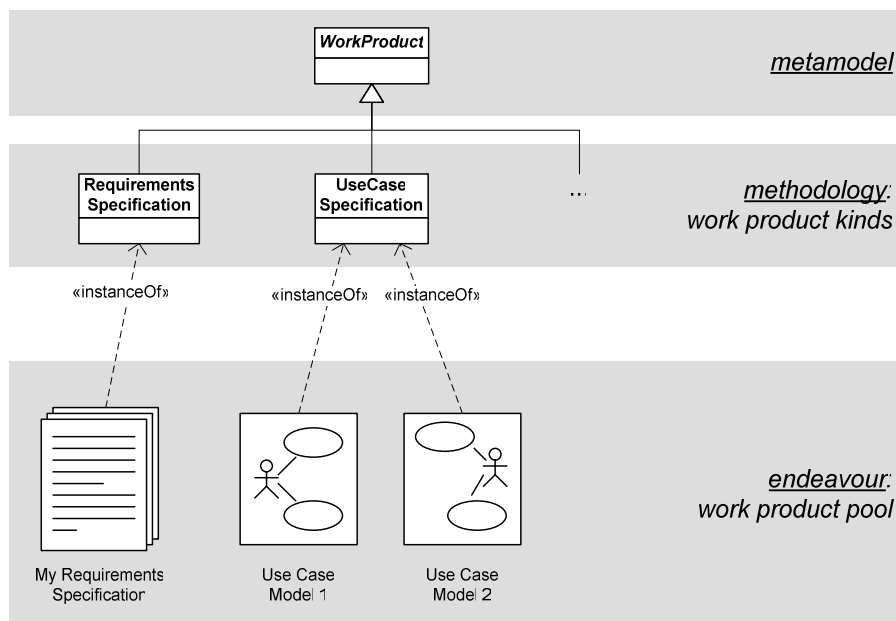
OUR APPROACH

- Products are the focus
- Purpose dependencies
- Opportunistic
- Just-in-time enactment

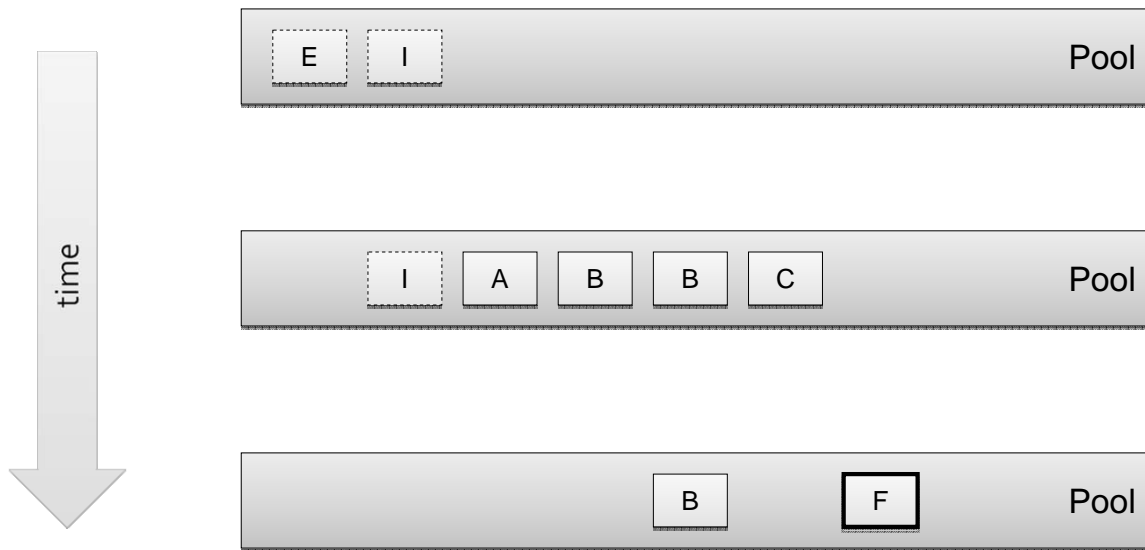
Specification of a Methodology



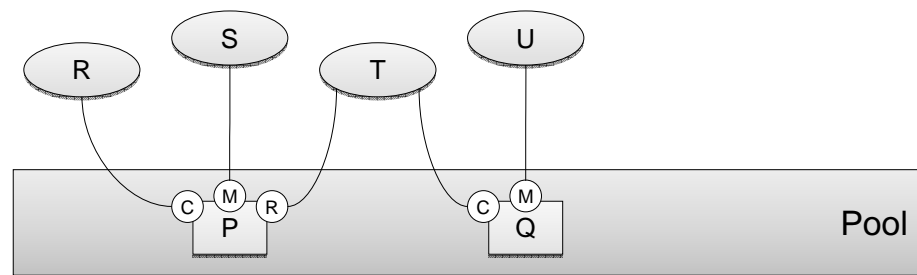
The Work Product Pool



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

The screenshot shows the 'MethodComposer for Developers' interface for the 'Endeavour SuperCalc' project. It is divided into three main sections:

- Candidate task kinds:** A tree view of tasks that are ready to be performed. Tasks include 'Validate requirements', 'Modify System Requirements Document', 'Define deployment mechanisms', 'ReadOnly Operational Context Description', 'ReadOnly Infrastructure Description', and 'Create Deployment Guide'. Each task has associated status indicators.
- Tasks in progress:** A tree view of tasks currently being executed. Tasks include 'Construct domain class model', 'ReadOnly System Requirements Document', and 'Create Class Diagram'. Status indicators show progress.
- Work product pool:** A table listing completed or partially completed work products.

Type	Title	Status	Version
Operational Context Description	SuperCalc Operational Context Description	Accepted	1.1
System Requirements Document	SuperCalc System Requirements	Accepted	1.2
Class Diagram	Problem Domain Class Diagram	Complete	1.0
Class Diagram	Security Domain Class Diagram	Initial	0.8

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”