



Creating Applications Using Parameterized Frameworks

*Quickly developed and
highly customized*

*OMG's Second Workshop on UML for Enterprise Applications:
Model Driven Solutions for the Enterprise
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Tomoo Yoda
Synergy Research Corporation
yoda@synergy-res.co.jp

Who am I?

- ✦ The president of Synergy Research Corporation—Tokyo, Japan
- ✦ Providing OO analysis/design and systems integration services to Japanese clients
- ✦ Focused on parameterized frameworks and their application for software productivity
- ✦ Recently developed a tool and a process to support MDA in a parameterized way
- ✦ Joined the initial submission to OMG EDOC RFP as a former member of CBOP

What I am presenting

- ★ Our trial MDA process with parameterized frameworks
 - Framework
 - Process
 - Composition and Transformation
 - Tools
- ★ Findings

The motivation

- ✦ In many years of OO analysis/design and systems integration, I have repeatedly seen *things* from past experience reappear in different forms in new projects.
- ✦ But the **knowledge** of these repeatedly reappearing *things* reside only in our heads and is hard to reuse effectively.
- ✦ (Binary) Components have always been limited solutions, because they are a mixture of many, many specific *things*, e.g.:
 - Client industry, Client business rule, Client's customer's preferences
 - Operating System, Computer language, Distribute platform (EJB,proprietary O-R mapping, Client/Server, ...)
- ✦ What we need to represent is this **knowledge** of proven best practice, not the *things* in specific forms!
- ✦ To reuse this **knowledge** effectively, it must be represented in an organized, visible and easily manipulated way.

Knowledge: Right Structure

☀ Right partitioning

☀ Business knowledge

- Business concept
- Relationship between business concepts
- Best practice domain model
- Standard domain model

☀ Technology knowledge

- Platform
- Optimization
- Deployment

☀ Right granularity

But How?

- ✦ Framework
- ✦ Behavior of framework
- ✦ Framework import mechanism
- ✦ Model transformation

Frameworks can be Confusing

- ☀ Traditionally

- A collection of collaborating abstract classes

- ☀ In Catalysis context

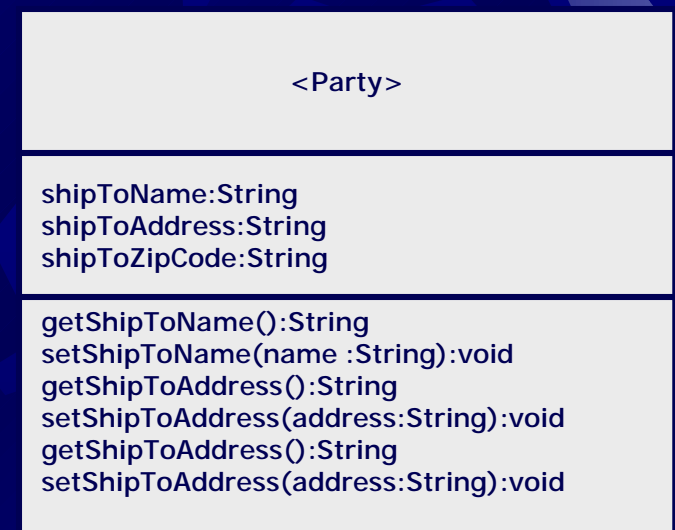
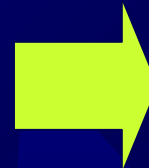
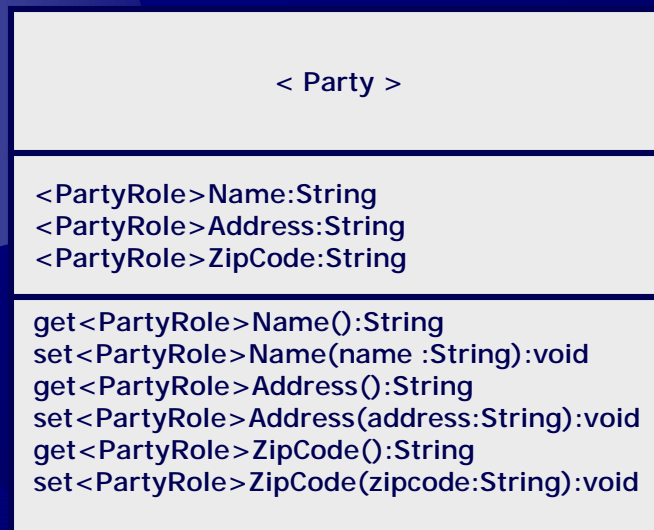
- *A package designed to be imported with substitutions. It “unfolds” to provide a version of its contents that is specialized based on the substitutions made.*

(The Catalysis Approach, by Desmond F. D’Souza and Alan Cameron Wills)

- OMG EDOC Chapter 4 ‘The Patterns Profile’
- Simply called ‘Framework’

Substitution

[PartyRole | ShipTo]

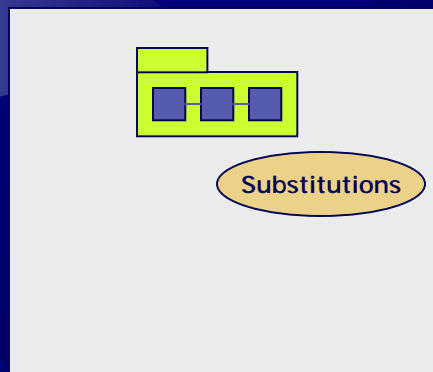


Framework Import Mechanism

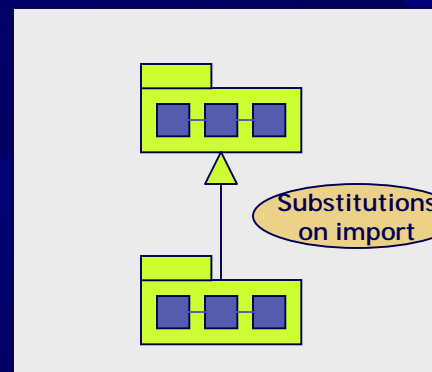
- ★ Framework inheritance

- Single
- Multiple

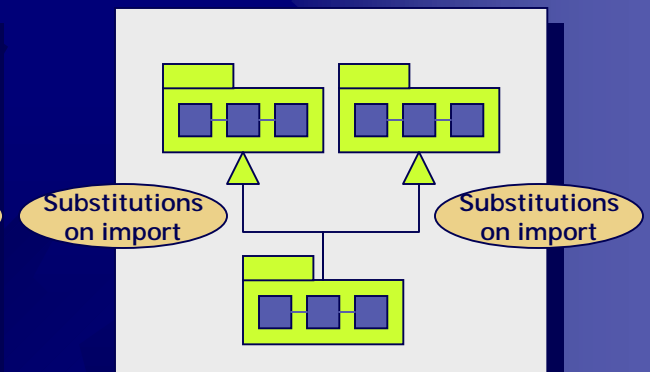
- ★ Inheritance can be controlled by substitutions on import



Simple



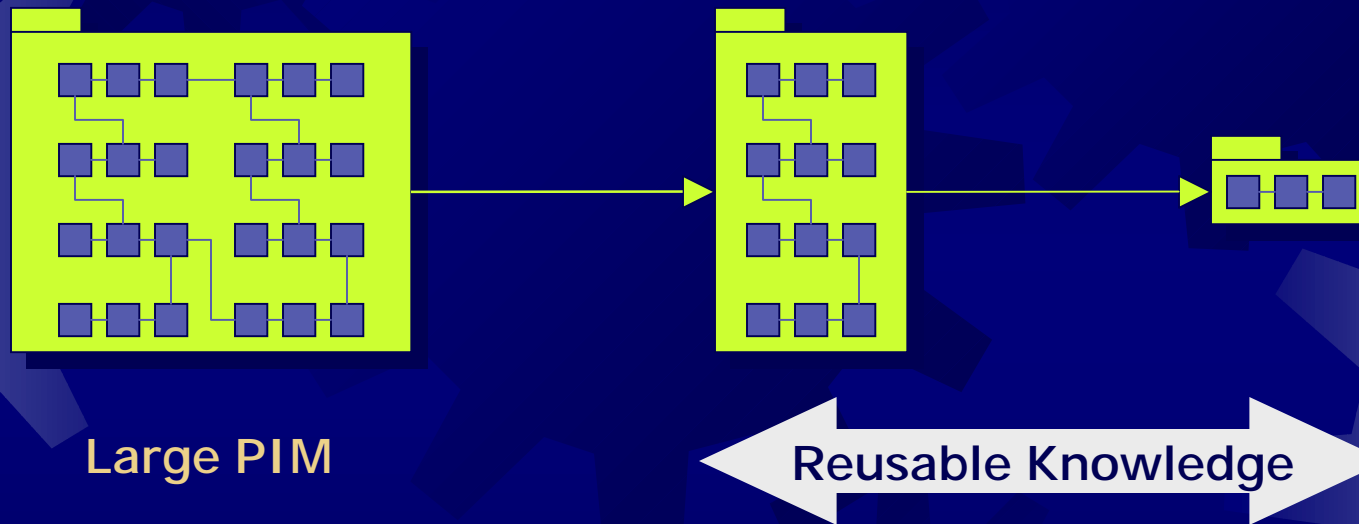
Inheritance



Multiple Inheritance

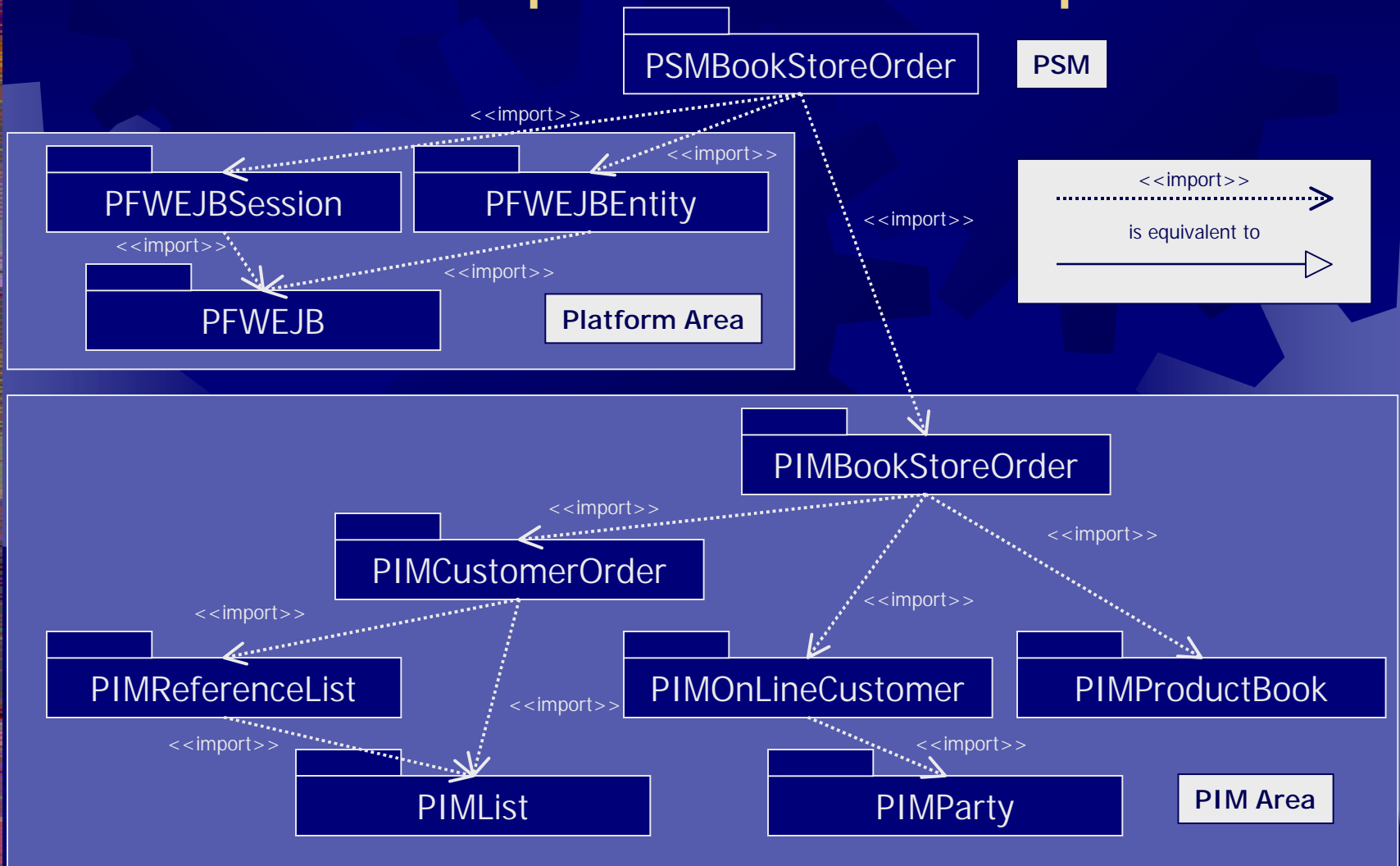


Frameworks Hold Knowledge



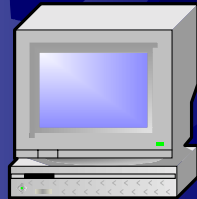
- ✦ If the MDA process was to start with a large PIM, its power would be limited

Framework Import Relationships: An example



Synergy Exploder

Off-the-shelf
CASE Tool
such as Rational Rose



XSLT



Exploder

UML Manipulation Interface

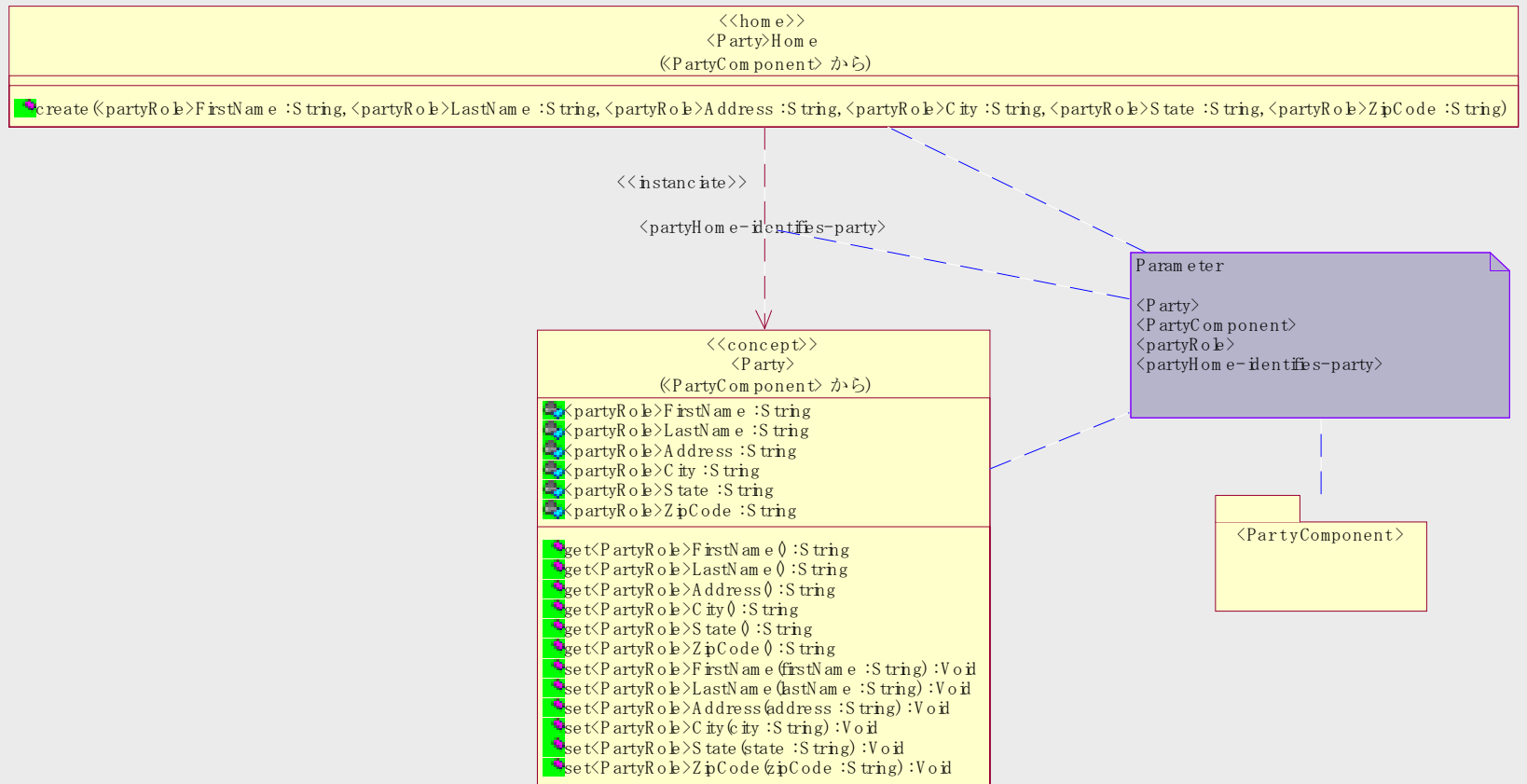
UML Type System

Automatic Namespace Maintenance Mechanism

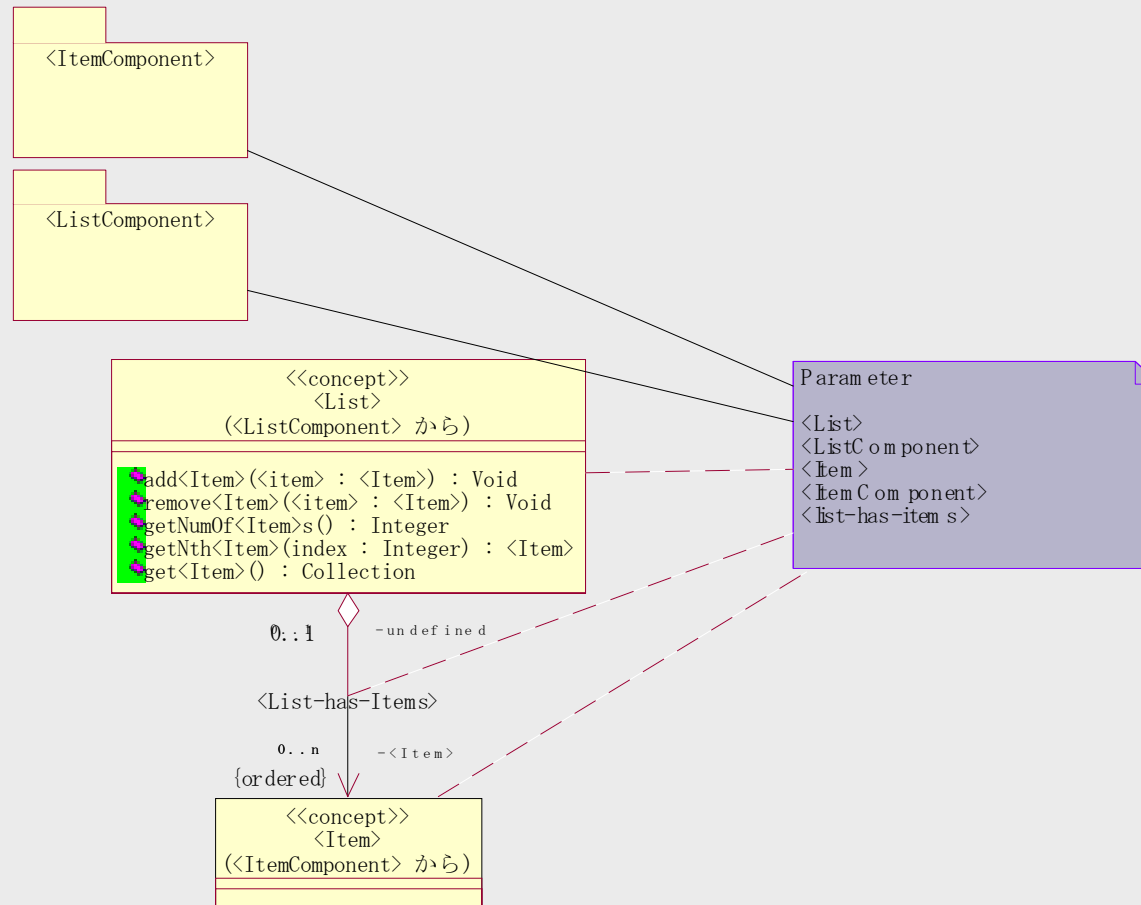
XML Loader/Unloader

Proprietary XML Formalism for Structural Elements in UML Foundation.Core Package

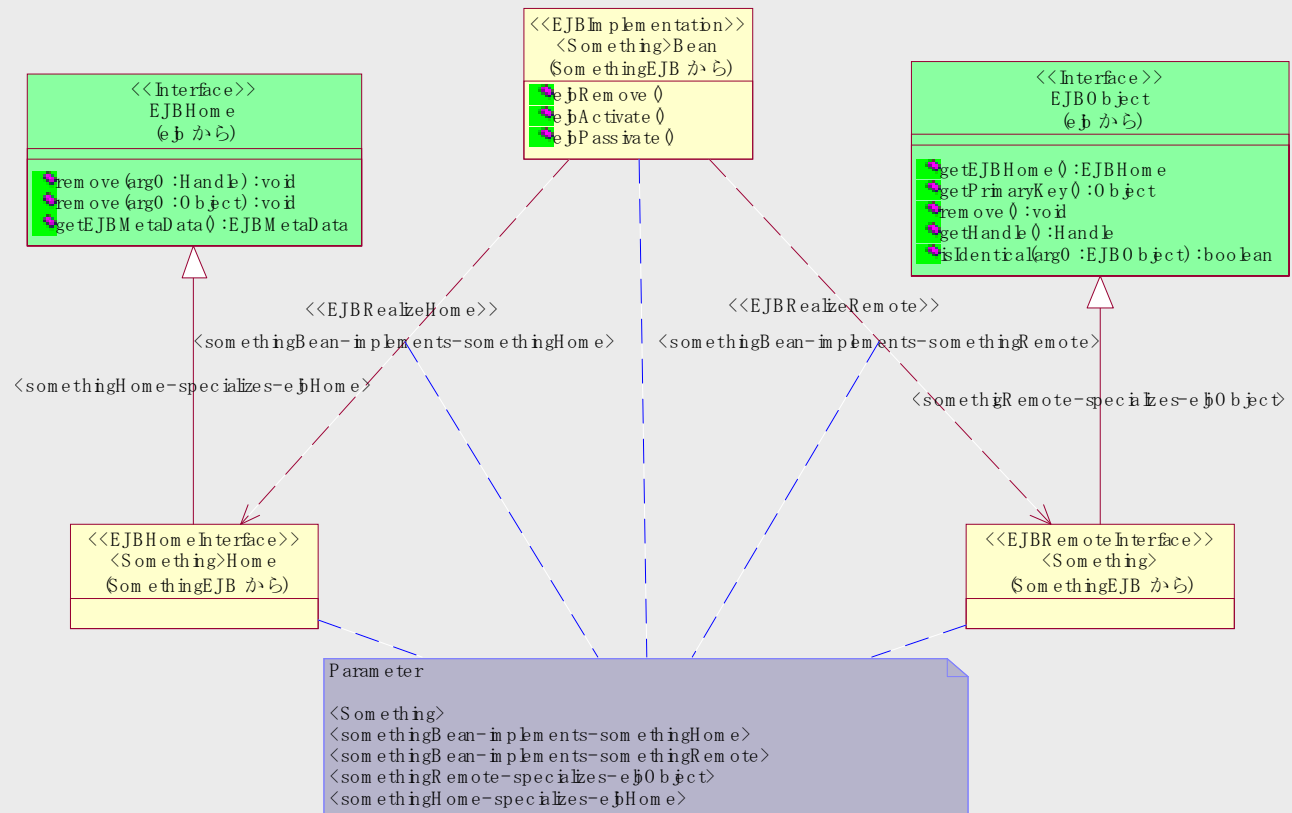
Attribute-centric Framework



Operation-centric Framework



Platform Framework



JSR(Java Specification Request) #26 gives the UML profile to be used here

Resolving Name Conflicts

Microsoft Internet Explorer - Synergy Web Application Patterns

Parameterized Framework

Framework Name: FFWEEntity

Class Diagram with Default Parameter Settings

Conflict Resolution

Back to the specification

Loser/Winner Report

LOSER					WINNER				
Document No.	Tag	Id	Name		Document No.	Tag	Id	Name	
FFWEa	1	package	a18007	java	FFWEb01a	1	package	a18007	java
FFWEa	1	package	a18008	java	FFWEb01a	1	package	a18011	java
FFWEa	1	package	a18008	SomeName.EB	FFWEb01a	1	package	a18008	SomeName.EB
FFWEa	1	class	a1804	EBImplementation	FFWEb01a	1	class	a1804	EBImplementation
FFWEa	1	package	a18000	eb	FFWEb01a	1	package	a18000	eb
FFWEa	1	interface	a20002	EBName	FFWEb01a	1	interface	a18000	EBName
FFWEa	1	interface	a20005	EBObject	FFWEb01a	1	interface	a18000	EBObject
FFWEa	1	interface	a20004	EntityBean	FFWEb01a	1	interface	a18008	EntityBean
FFWEa	1	interface	a20001	EntityContext	FFWEb01a	1	interface	a18008	EntityContext
FFWEa	1	interface	a20003	SessionBean	FFWEb01a	1	interface	a18007	SessionBean
FFWEa	1	interface	a20006	SessionContext	FFWEb01a	1	interface	a18008	SessionContext
FFWEa	1	exception	a20008	EBException	FFWEb01a	1	exception	a18012	EBException
FFWEa	1	package	a18004	me	FFWEb01a	1	package	a18004	me
FFWEa	1	exception	a48008	RemoteException	FFWEb01a	1	exception	a18013	RemoteException
FFWEa	1	class	m2	SomeNameFlow	FFWEb01a	1	class	a18011	SomeNameFlow

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Default Parameters:

Id	Parameter Name	Default Value
aa18060000	CFTContext	context
aa18060008	CFTEntity	EB
aa18060048	CFTEBImplementation	EBImplementation
aa18060055	CFTEBImplementation	EBImplementation
aa18060068	CFTLoadParam	objLoadParam



Unfolding Yields PSM