Software Architecture Modelling, Analysis and Implementation with SoftArch

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Overview

- Software Architecture vs OOA and OOD
- Modelling SAs in SoftArch:
  - Architectural abstractions
  - Refinement
  - Templates
- Architecture analysis
- Architecture visualisation
- SoftArch architecture...
Software Architecture - our spin...

- Translation of OOA specification to OOD design via well-formed refinements
- SA organises OOA for implementation, adhering to functional/non-functional specs

Object-oriented Analysis
Functional & non-functional specifications

Software Architecture
Architecture components, associations, annotations, properties

Object-oriented Design
Classes, reused APIs, file/table specs, code fragments etc.
Overview of SoftArch

**CASE Tools**
- e.g. Rose, Argo/UML

**OOA Specs**
- (functional & non-functional)

**Import/export agent(s)**
- Import OOA-level specifications from CASE tool into SoftArch

**SoftArch**
- High-level architectural model
  - Successively refined architectural models
  - Low-level architectural model

**JComposer**
- CASE Tool

**JVisualise**
- Monitoring Tool

**Component OOD & some code sent to JComposer CASE tool by SoftArch, Implementation completed using JComposer**

**Import agent**
- Running system component events listened to & basic reconfiguration of running comps by JVisualise component object monitoring tool

**Limited forms of user manipulation used to change running system configuration...**

**Java Classes & Code**

**Running System Objects**

**Analysis Agents**
- Refinement templates
- Software architecture process model(s)
- Software component meta-model(s)

**OOA Specifications**
- Functional & non-functional

**Import/export agents**
- Import OOA-level specifications from CASE tool into SoftArch

**Updates to static views & dynamic views interchanged to keep each consistent with the other**

**Static modelling**

**Dynamic visualisation**
Example System to Model...

Flight Bookings
- Web Browser
- Travel Itinerary
- Map visualisation
- Booking Servlet
- Flights Manager
- Booking Manager
- SABRE Bookings
- Itinerary App Server
- Flight Bookings
- Travel Itinerary
- Map visualisation
- Agent
- Word, Excel etc

http server
- Booking
- Flights Manager
- CORBA objects
- Bookings DB
- Flights DB
- Itinerary DB

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Modelling...
Refinement

High-level architectural model

Successively refined architectural models

Low-level architectural model
Processes, templates, meta-modelling...
Architecture Analysis

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Dynamic Visualisation
Other features...

- **Import/export:**
  - OOA spec from CASE tool
  - OOD to CASE tool

- **Code generation:**
  - Limited (currently via our JComposer CASE tool)
  - Planned: generate test bed for MTE project middleware analysis examples

- **Analysis:** MTE & other performance results used during modelling/analysis
SoftArch Architecture...
References


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