Combined Reuse

Product Line Engineering meets Service Oriented Architecture

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Outline

• Reuse in Solution Business: Meet Archibald!
• Typical Forces in Solution Business
• INDENICA Approach
• INDENICA Toolbox
• Further INDENICA Topics
• Discussion
Welcome Archibald!

Hi!

I am Archibald, the Software Architect.

I am working in a department specialized on warehouse management solutions.

Let’s see, what my boss has for me…
Customer Requirements

... Customer...
... Complete solution...
... $$
... very soon... cheap...

never did this before
not our core competence
Architecting using existing assets

Our Portfolio:

Warehouse Mgmt

Common of the shelf

FedEx
DHL

Shipping
Conveyor Control
Pick to Light
Solution Architecture

Open Source Application Integration

Warehouse Mgmt

Conveyor Control

Pick to Light

Shipping
Second Project

...Just like the last... $$$ ...high throughput...

ok

Architect this
Secod Architecture

- Warehouse Mgmt
- Conveyor Control
- Shipping
- Quality Mgmt

Architect this

Fast Expensive ESB

DHL
FedEx
Third Project

... an easy one..
... combination of last two...

Hm...
Third Project

Archibald! Follow me to Maintenance Hell!

Can I really do nothing about this?
Forces in Solution Business

- Many COTS Components
- Much unbound flexibility
- Configuration Scripts
- General purpose
- Few tool experts
- No language elements for reuse
- Glue code
- DRY
- Requirement Fragmentation
- One Single Truth
- Changing Scalability Requirements
- Many COTS Components
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INDENICA Approach

Domain oriented decision model

Decision Model

Mapping

Domain decisions

Integration model

Deployment Script

Glue

Middleware

WMS

Shipping
• Use Product Line Approaches for the complete solution
• Use domain vocabulary to describe the variability of the solution
• Reduce Flexibility with COTS specific decision model
• Map domain variability to flexibility provided by COTS tools.
• Generate glue code / middleware configuration from Platform Independent Models

⇒ Create a domain specific family of integrated solutions
- Specialized decision modeling language
- Mapping and generator framework
- View based integration architecture framework
  - Model contains variability information
  - Can describe both Platform Independent and Platform Dependent Models
  - Platform (Middleware) specific generators for
    - Glue Code
    - Middleware Configuration
- Variability-Aware Deployment Framework
## Advantages

<table>
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<th><strong>Much unbound flexibility</strong></th>
<th>Domain oriented decision models reduce flexibility to the amount needed for business</th>
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<tbody>
<tr>
<td><strong>General purpose</strong></td>
<td>Tool Experts only necessary for mapping from Tool decision models to configuration files</td>
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<tr>
<td><strong>Few tool experts</strong></td>
<td>Reduced Requirement Fragmentation: All occurrences of variability requirements are bound to a single decision</td>
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<td><strong>Requirement Fragmentation</strong></td>
<td>Single source of truth for integration needs</td>
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<td><strong>One Single Truth</strong></td>
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Further INDENICA topics

- Scoping of domain specific service platforms
- Requirement modeling for domain specific Platforms
- Architecture decision support framework
- Governance Aspects
- Unified Monitoring and Adaptation of Solutions

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THANK YOU!