Co-Evolution and Consistency in Workflow-Based Applications (position paper)

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Contents

- Context: workflows and Cumbia
- Co-Evolution effects and consistency problems
- Classification of changes
- Future work
Context

- Workflows and workflow-based applications
- Cumbia platform
  - Separation of concerns
  - Executable models
  - Open Objects
Separation of concerns

- One metamodel per concern
  - Control metamodel
    - Cumbia-XPM
Separation of concerns

▶ One metamodel per concern

▶ Control
▶ Time
▶ Resources
Open Objects

- Each metamodel is a set of specialized Open Objects
  - State
  - Coordination capabilities

Structure
- An 'entity' with state and methods
- A 'state machine' that represents the life-cycle
- Actions

<table>
<thead>
<tr>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>activate( )</td>
</tr>
<tr>
<td>suspend( )</td>
</tr>
<tr>
<td>restart( )</td>
</tr>
<tr>
<td>getData( )</td>
</tr>
<tr>
<td>finish( )</td>
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</tbody>
</table>
Weaving of Models

- Describing interaction between models
  - Weaving is specified at the level of models
  - Realized at runtime
Change and evolution in Workflows

- Designed to support change
  - Business forces

- Variability in:
  - Processes
    - Models
    - Weaving
  - Concerns
    - Metamodels
    - New metamodels
Change and evolution in Workflows

- Designed to support change
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- Variability in:
  - Processes
    - Models
    - Weaving
  - Concerns
    - Metamodels
    - New metamodels

- How to handle consistency problems in order to better support evolution?
Co-Evolution and consistency

- Horizontal co-evolution
  - Evolution of metamodels

Positive and Negative effects
Classification of evolution steps

- Add elements to the metamodel
- Remove elements from the metamodel
- Modify elements in a metamodel
  - Add states
  - Remove states
Addition of an element

- Adding 'Multi Activities' to the control metamodel
  - Multiple parallel workspaces
Removal of an element

- Removing 'Multi Activities' from the control metamodel
Modification of Elements

- Addition of states

- Removal of states

- Other changes
Future work

- Further work on the classification
  - Better assess and classify co-evolution effects
  - Work with traces
  - Repair actions

- Consistency and vertical co-evolution
  - Metamodels, models and weaving
Questions?

▶ Thanks for listening!