



HCI & MDE

Research directions, plans and goals

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HCI – UI models

- Task models, domain models, navigation models, user models, dialogue models, presentation models etc.
- Used separately - loose integration between models
- Some of them not ready for industrial-scale projects
- Often lack of formal definition
- Ad-hoc semantics



Model-Driven Engineering

- Creating abstractions
 - Defining relationships and dependencies
 - Enabling software evolution, refactoring, code generation, etc.
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- Consistency
 - Strict definition (meta-model)
 - Well-defined semantics
 - High abstraction level



Gap between HCI & MDE

- HCI models require freedom & creativity
- MDE techniques require well-defined, strict and consistent models
- Solution?



Gap between HCI & MDE

- HCI models require freedom & creativity
- MDE techniques require well-defined, strict and consistent models
- Solution? – Formal semantics



Modeling notations

- ConcurTaskTrees
- ICO (Interactive Cooperative Objects OO-approach + PetriNets)
- UWE metamodel and profile
- CUP 2.0
- Sousa works on UI Development Lifecycle for Business-Driven Enterprise Applications
- Future is in visual languages (well-represented is half-solved)



Goals

- Empower HCI field by applying techniques of MDE
 - Describe state-of-the-art in the intersection of HCI modeling and MDE. Define exemplary use case to evaluate the methodology
 - Redefine selected HCI models by means of formal notation
 - Provide HCI developers and designers with tool support and improve development process of interactive applications

Example part 1

- In CTTE – it is possible to provide information about objects manipulated by task

Task Properties

General | **Objects** | Time Performance

Objects Required to Perform the Task

Name	Class	Type	AccessMode	Cardinality	Platforms:	Pda	Des	Mob	Voc
		▼	▼	▼	others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		▼	▼	▼	others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		▼	▼	▼	others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		▼	▼	▼	others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		▼	▼	▼	others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Object Input Actions

Object Name	Identifier	From

Object Output Actions

Object Name	Identifier	To

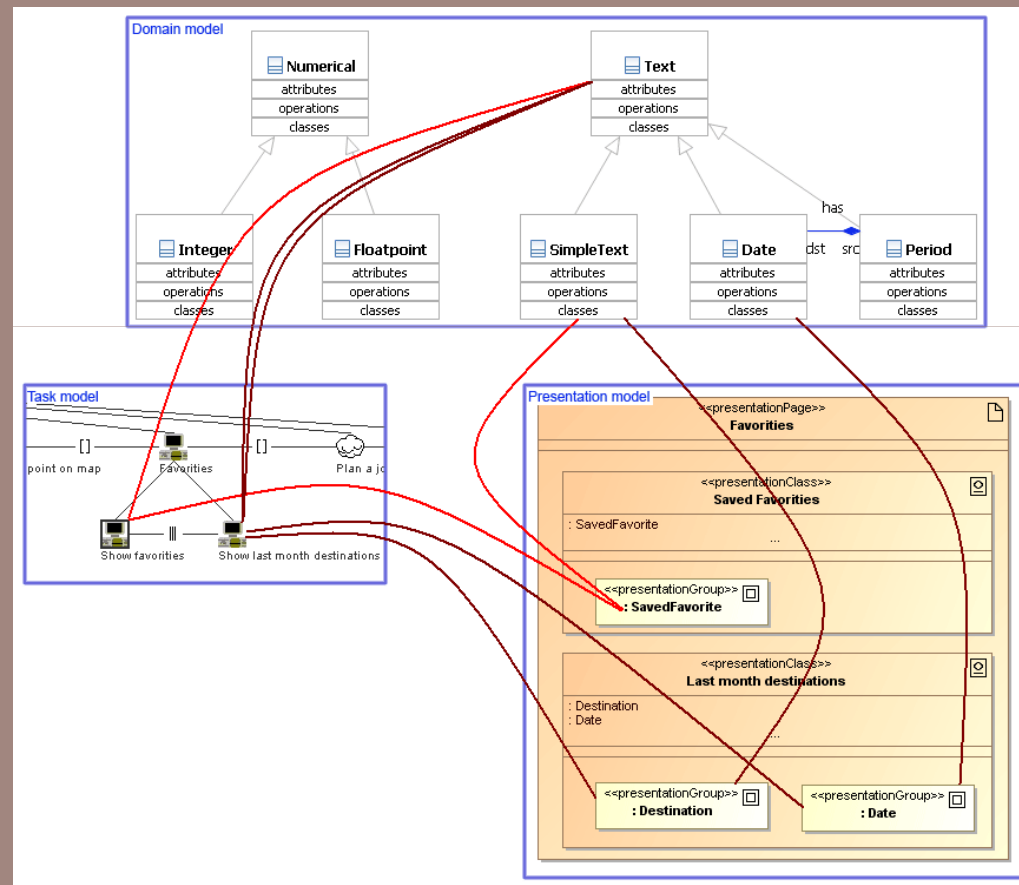
Update Cancel Clear Ok



Example part 2

- Provided object information isn't very useful
- Predefined general classes have no link to any other class-diagram
- Non-strict cardinality
- In tools supporting UI generation (TERESA) semantics of model and its transformations has been hardcoded

Future solution advantages





Research areas

- HCI models
- MDE techniques
- Software development processes
- Formal notations
- Semantics
- Model transformations
- Context sensitivity



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