

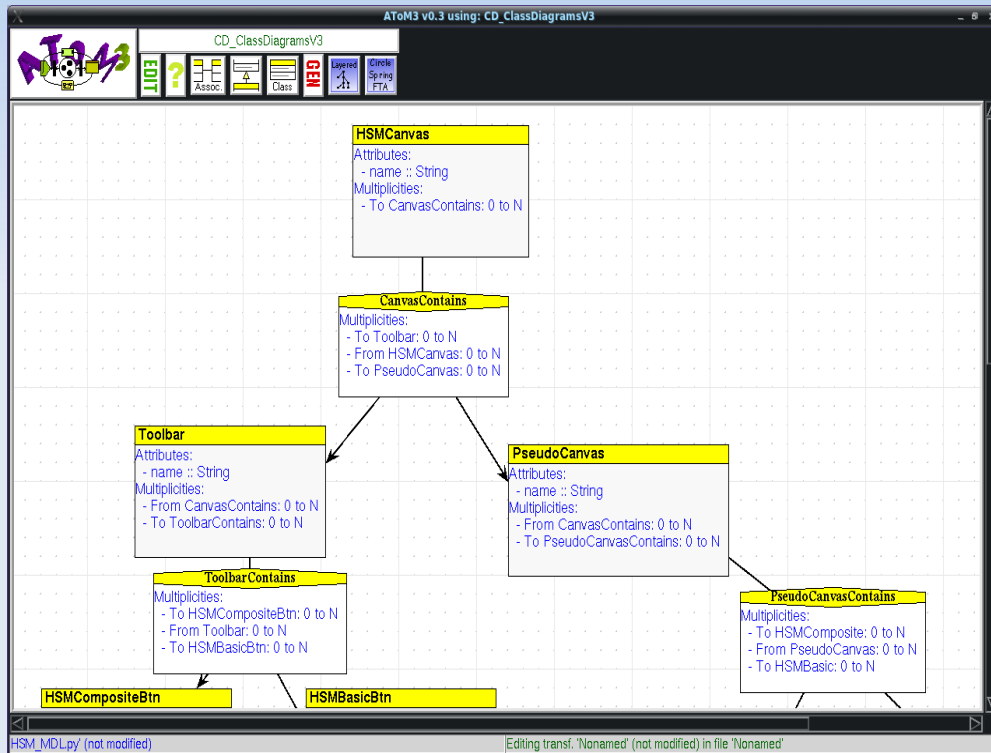
Modelling and Synthesis of User Interfaces for Complex, Web-Based Modelling Environments

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Overall Project Goal



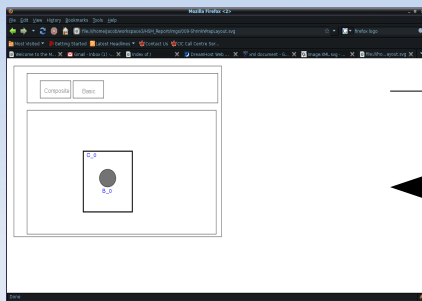
- The creation of a web-based meta-modelling environment for synthesizing domain-specific, web-based modelling environments.
- Enable language-based multi-formalism modelling.

End-to-End Modelling of UI

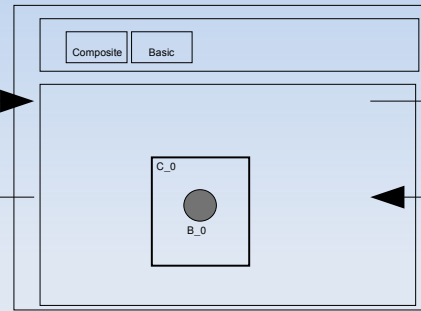
- Topical
 - Dave Raggett, W3C incubator group
- Useful
 - Complex behaviour described well by statecharts
 - Meta-modelling allows easy testing and automation
- Important concepts
 - Layering of Concrete Syntax, Abstract Syntax, and Semantics
 - Nested and Scoped UI
 - Statecharts for behaviour

Meta-Modelling the UI

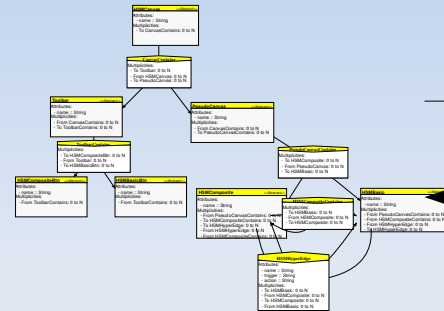
Two-Way Communication Between Each Layer



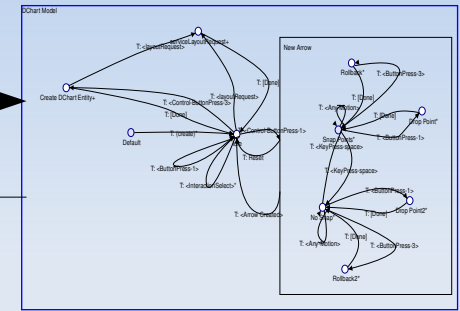
End UI



Concrete Syntax

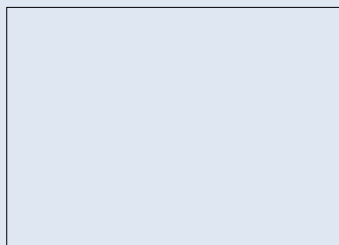


Abstract Syntax

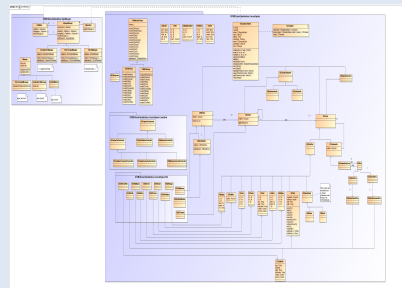


Semantics

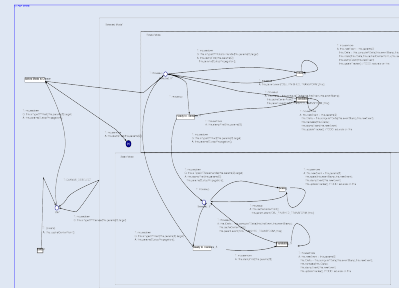
Each Layer Can Itself Be Metamodelled ...



Concrete Syntax



Abstract Syntax

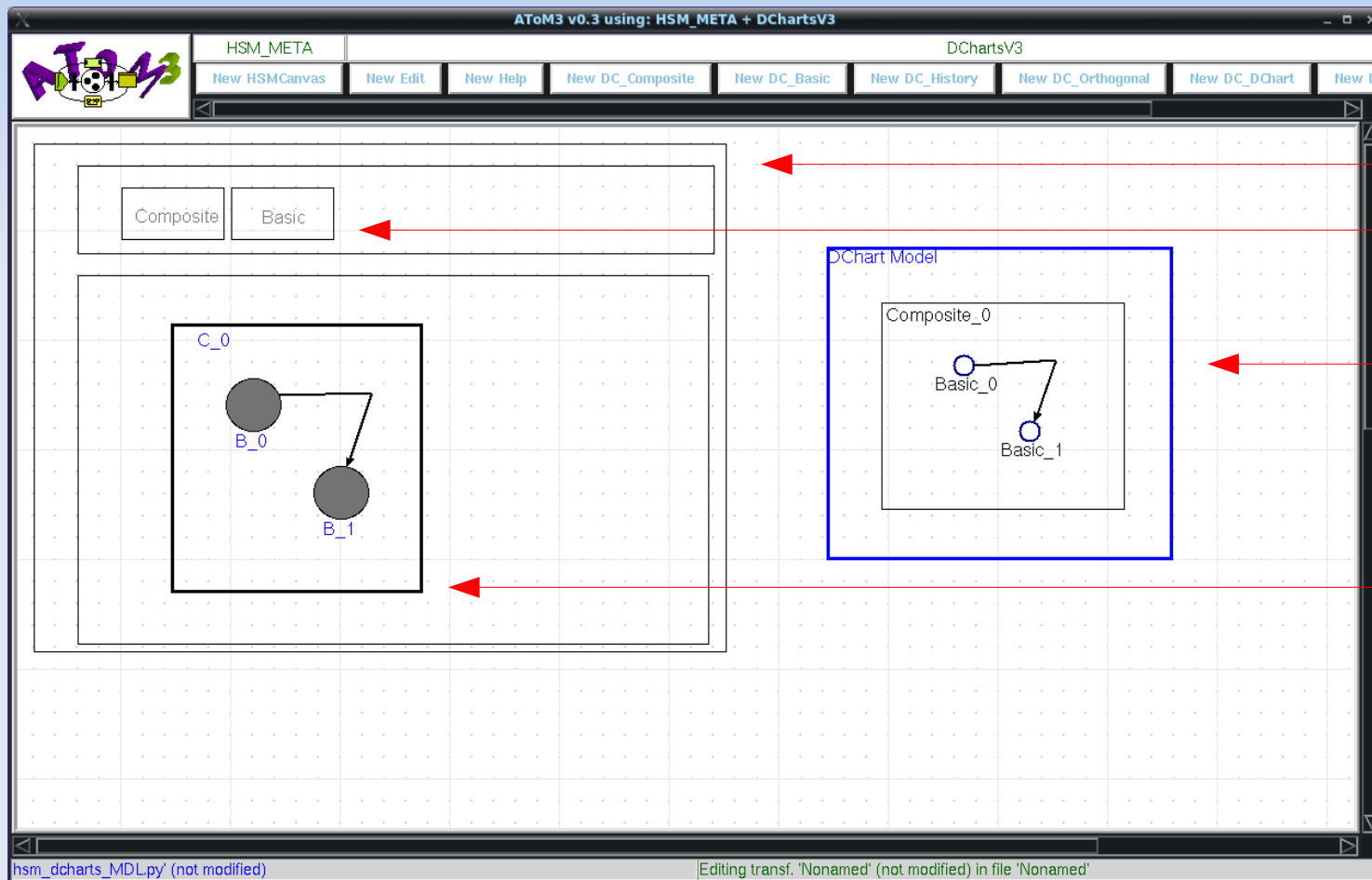


Semantics

Benefits of this Architecture

- Testing
 - At each layer, events can be recorded, later on played back within testing harness.
 - Allows headless automated testing of UI.
 - Each layer can be simulated, thus automated.
- Collaboration
 - Centralized server = easy sync
 - Easy to hook multiple terminals to the same graphics server: many-to-one relationship

Nested and Scoped UI



Buttons Formalism

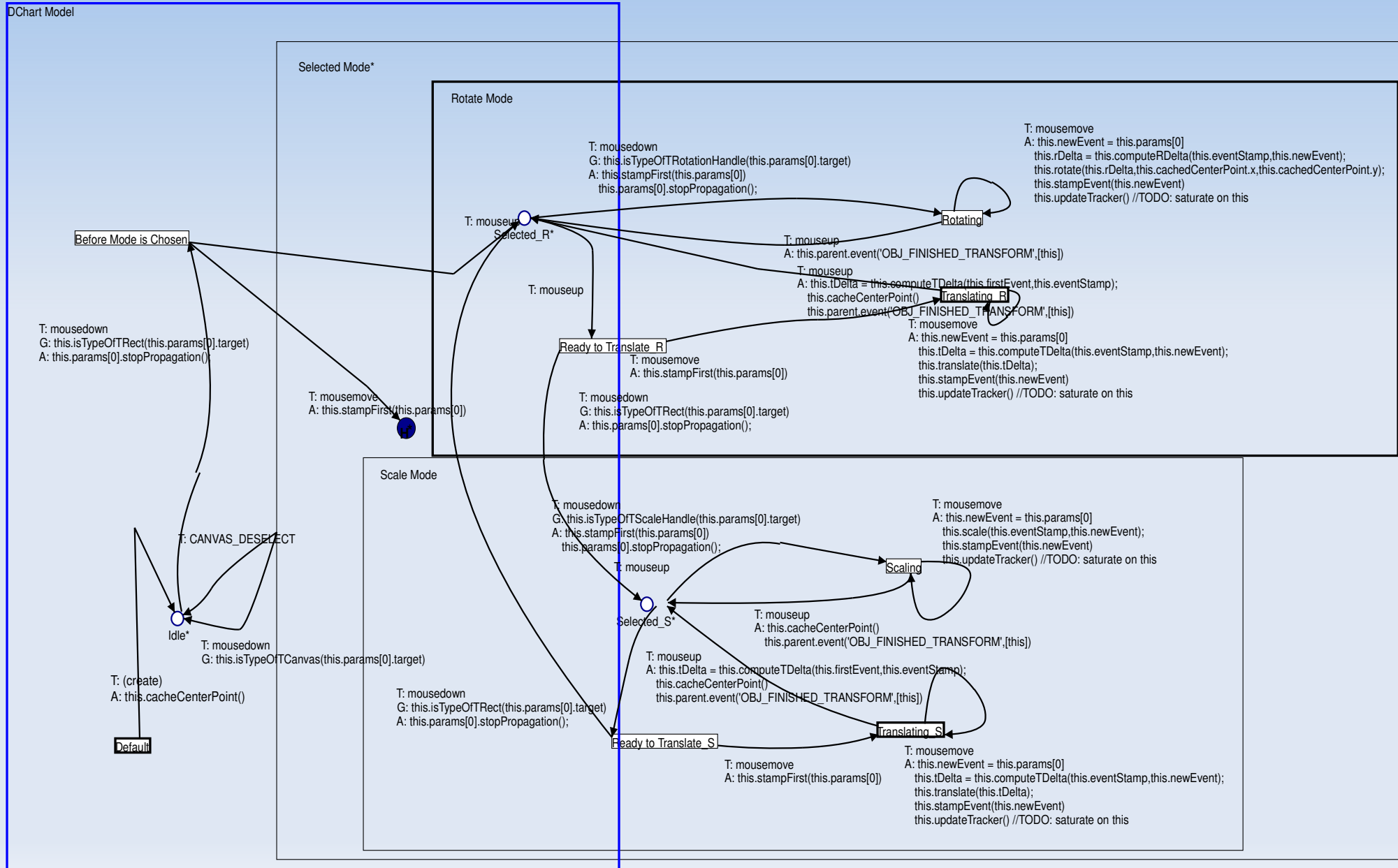
HSM Formalism

Nested Buttons Formalism

DCharts Formalism

Nested Bounding Box Formalism

Statecharts for Behaviour



How This Comes Together in UI

- Hierarchical State Machine Demo

Technical Challenges

- What platform to use for web vector graphics? SVG/VML? Flash? Silverlight?
- Libraries needed for complex, OO development with ECMAScript → Dojo
- Improving performance.
 - Optimizing Statechart-to-ECMAScript compilation.
 - Saturating high-fidelity operations.
 - Other optimizations.
- Determining best practices for development

Thank you for attending!