Generating Domain-Specific Model Editors with Complex Editing Commands

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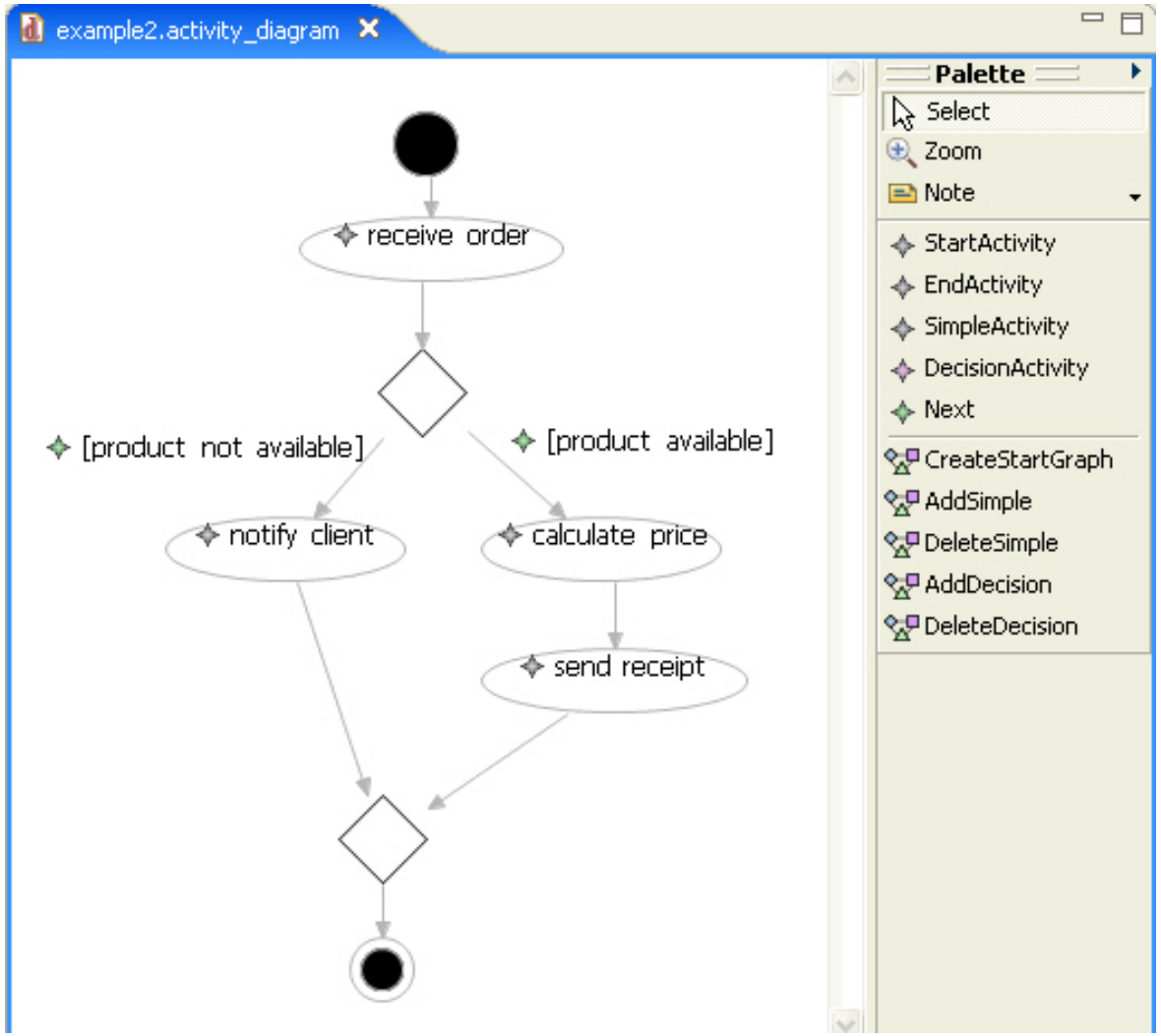
GMF editor with complex editor commands



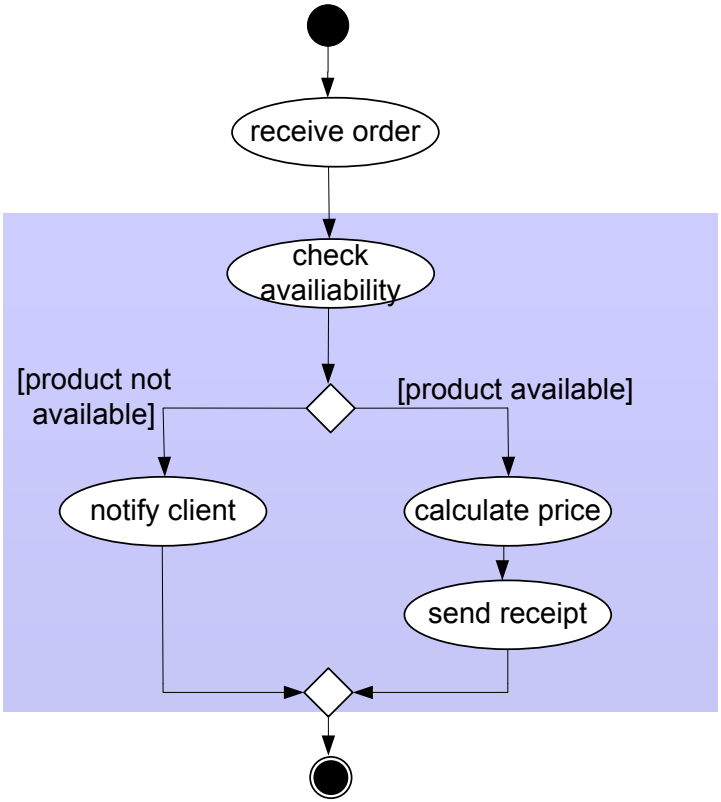
Graphical Modeling Framework (GMF)

- designer and generator for graphical editors
- one of the Eclipse Modeling Projects
- based on Eclipse plug-ins
  - *EMF (Eclipse Modeling Framework) and*
  - *GEF (Graphical Editor Framework)*
- resulting GMF-editors are also Eclipse plug-ins

GMF concepts:

- separation of abstract and concrete syntax,
  - *in editor design*
  - *in generated editor*
- separation of domain and diagram model
- model for user interface (tooling)
- editor generator for graph-like diagrams

Example: simple activity diagrams



Model elements:

- activities of different kinds:
  - *start activities*
  - *simple activities*
  - *decisions*
  - *end activities*
- control flow described by arcs
  - *could have annotated conditions*

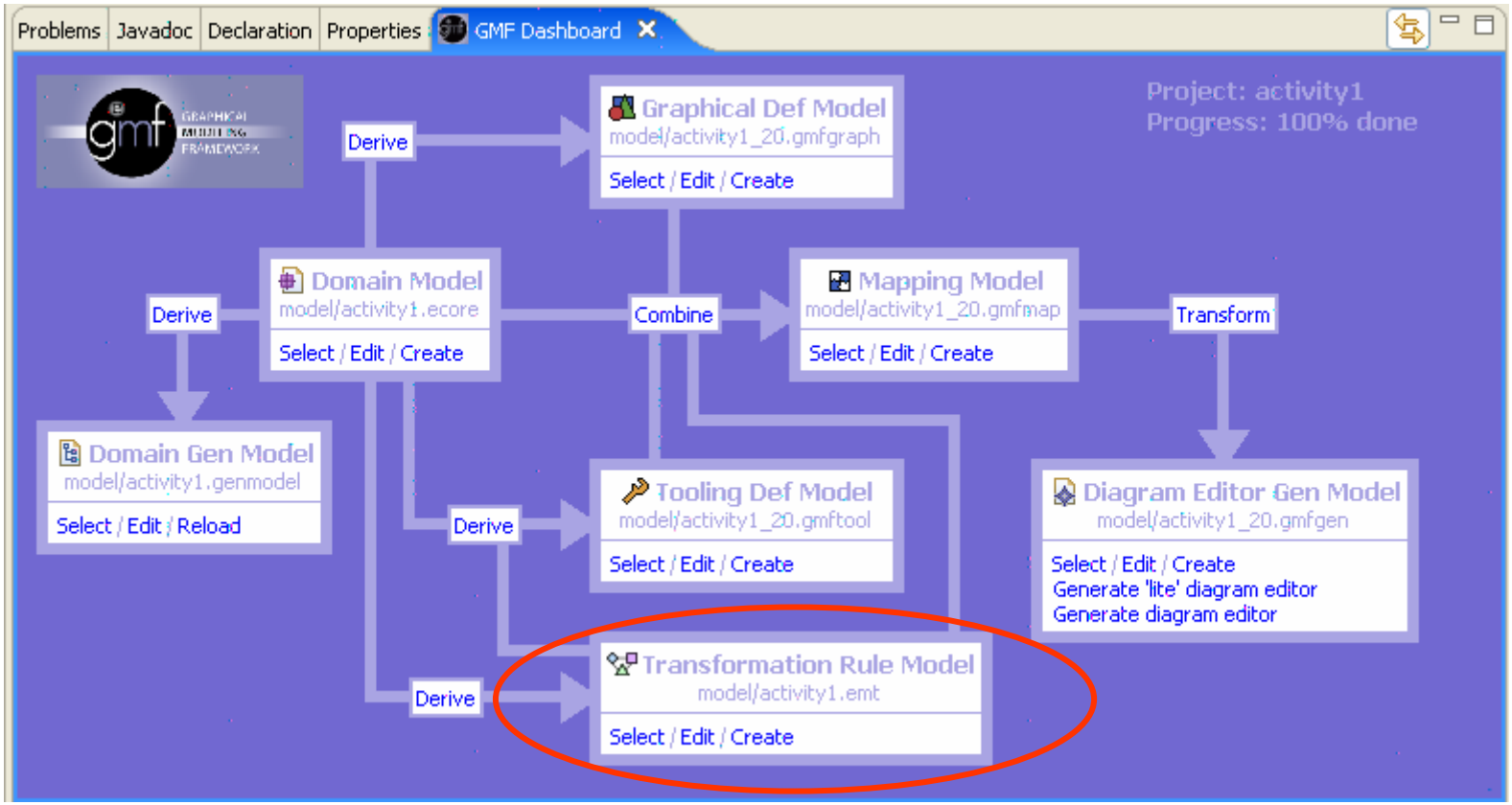
Constraints:

- one start activity only
- well-defined decision structures

Which kind of editing is supported by GMF?

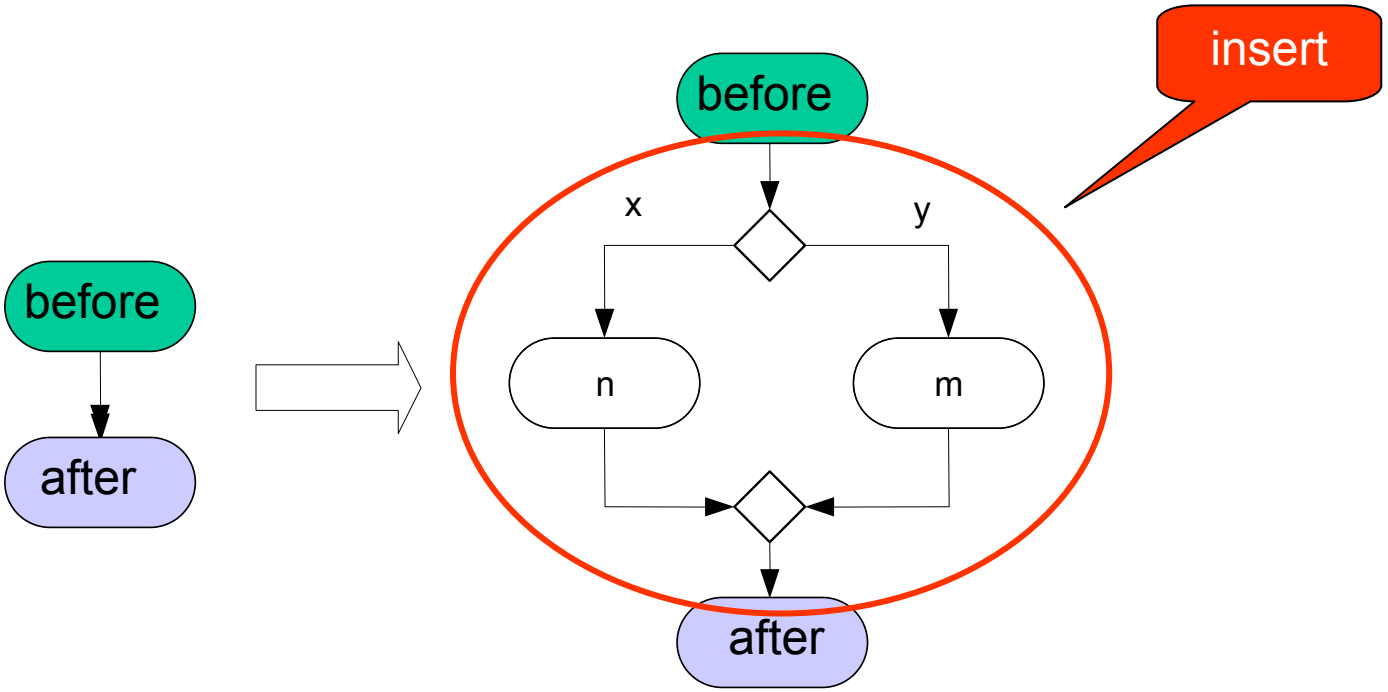
- GMF supports basic editing of graph-like structures.
  - *placing of node-like diagram elements in the panel*
  - *linking of nodes by line-like elements*
  - *checking of OCL constraints*
- Drawing complex diagrams means a lot of clicks.
- Incorrect diagrams may be possible.

Erweitertes GMF-Dashboard



Example for complex editor operation

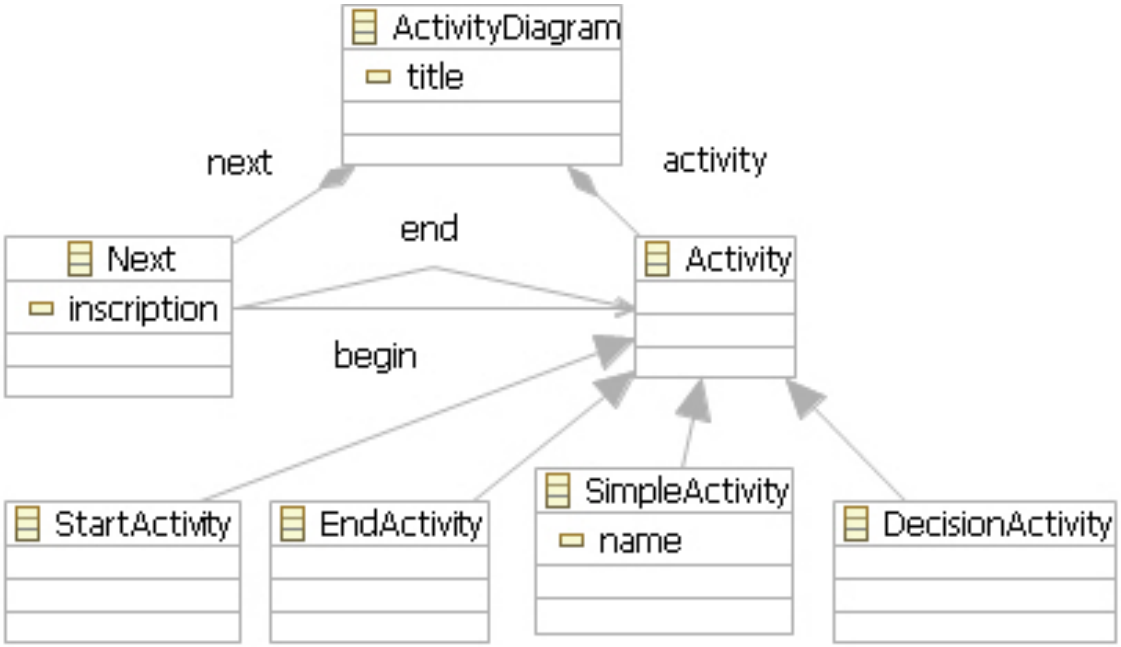
replace a simple activity by a decision structure



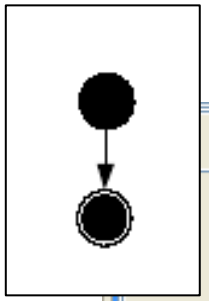
provide n, m, x, and y

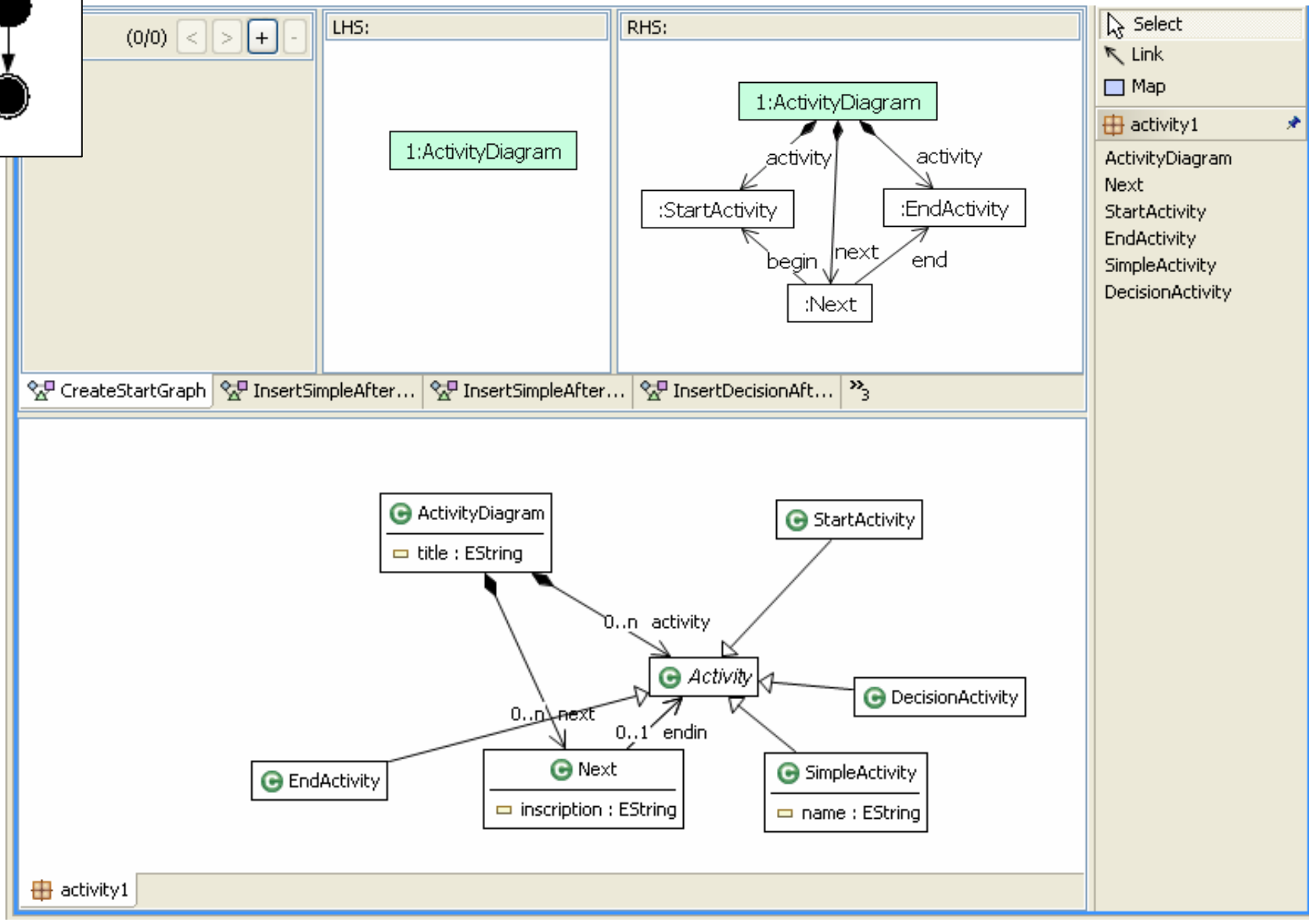
Example: domain model

Domain model for activity diagrams

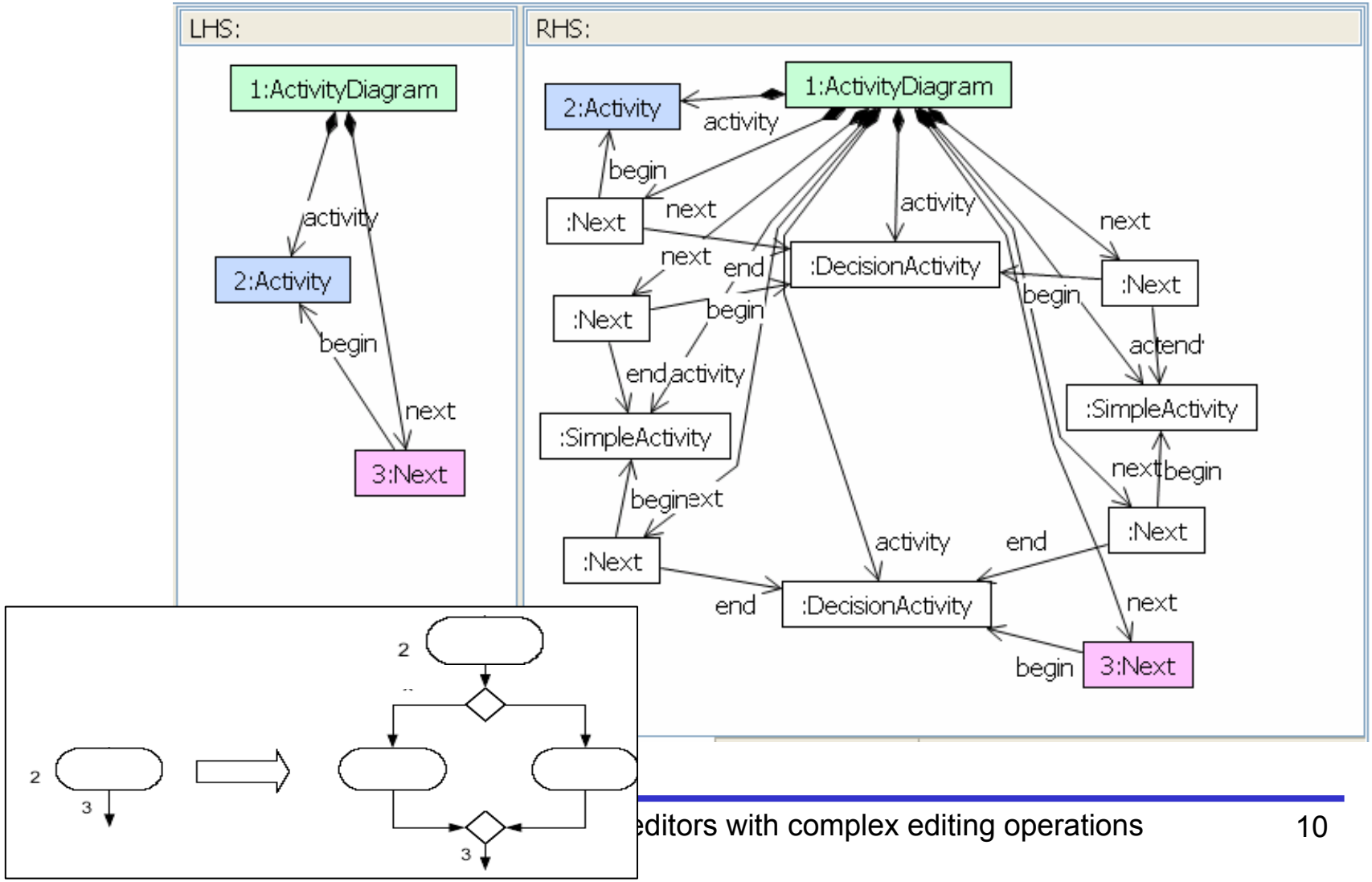


Designer for editor operations



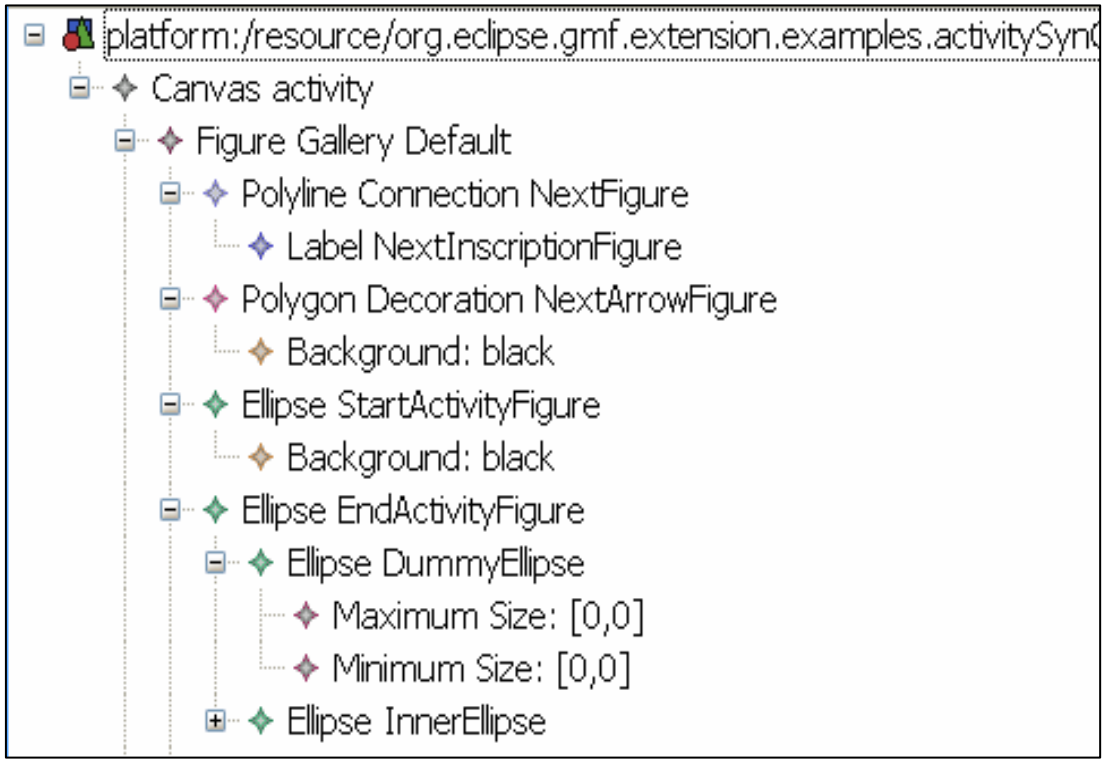


Command: InsertDecision



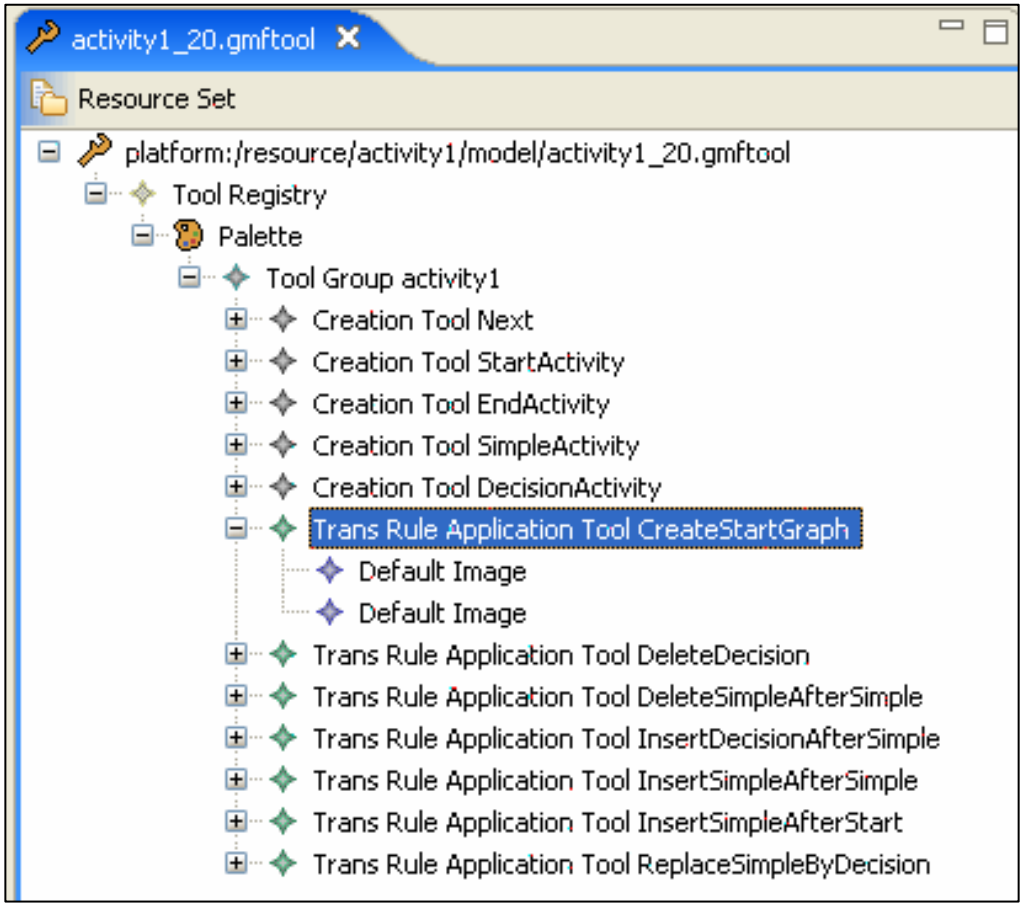
Example: diagram model

Diagram model for activity diagrams



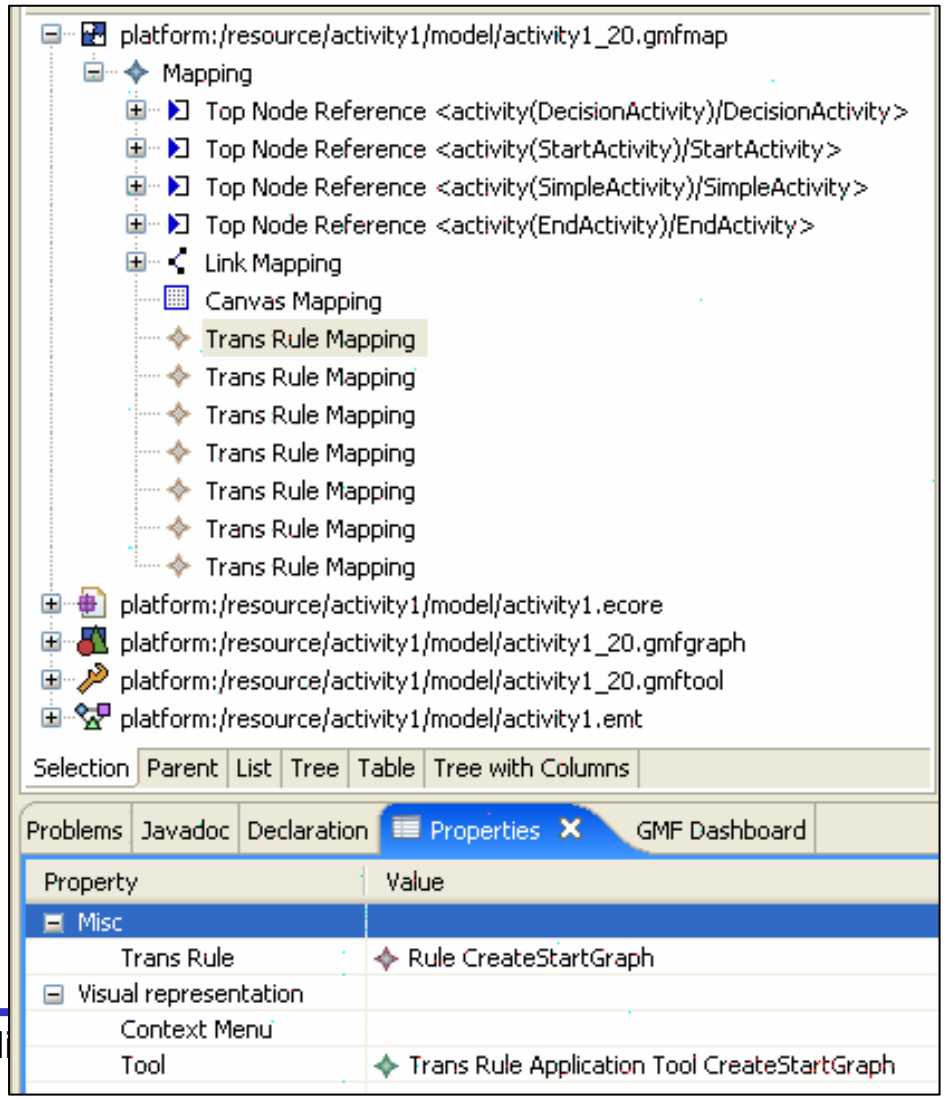
Tooling model with extension

- additional entries in palette
- for each new editor operation a new entry

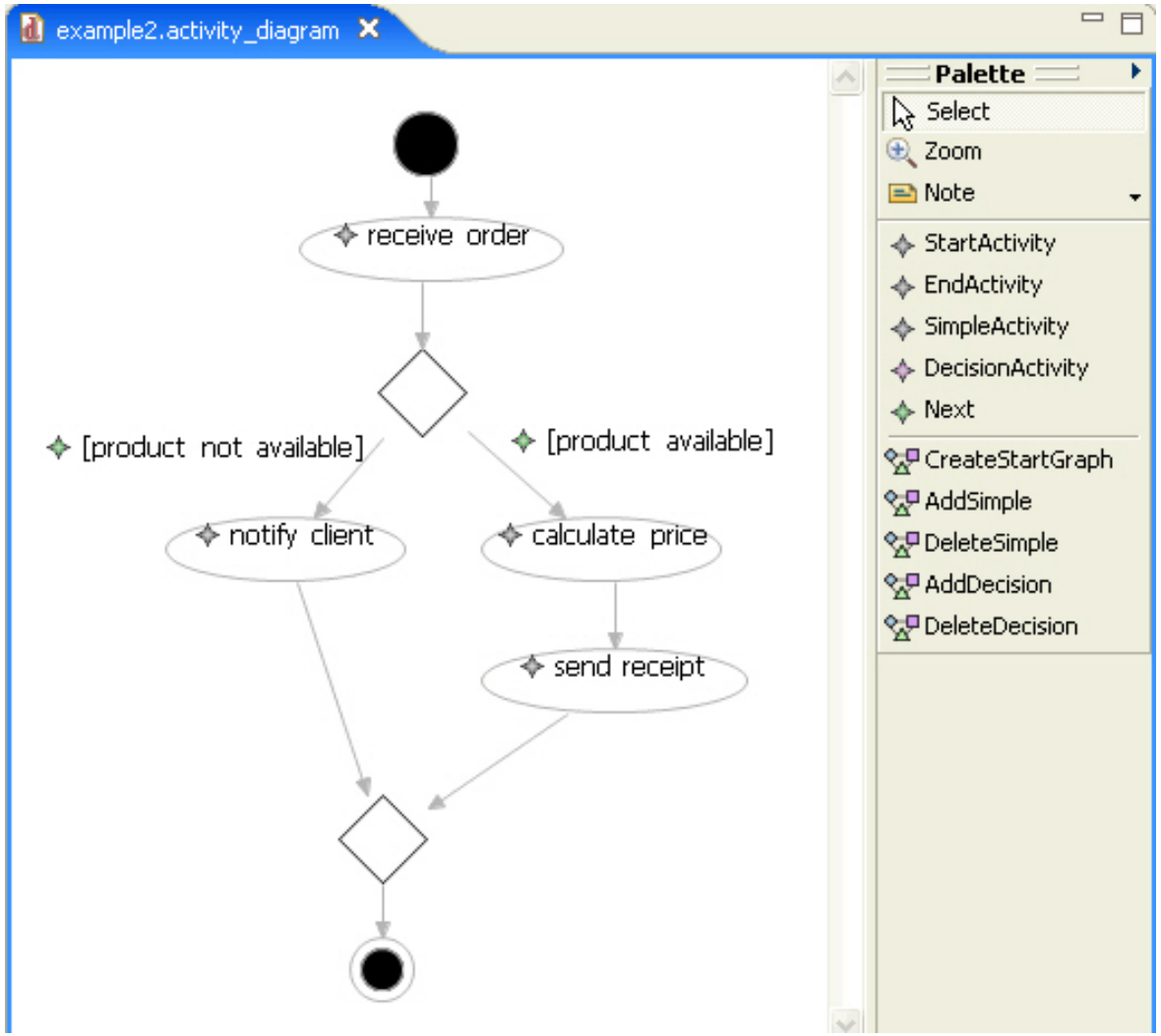


GMF mapping model with extension

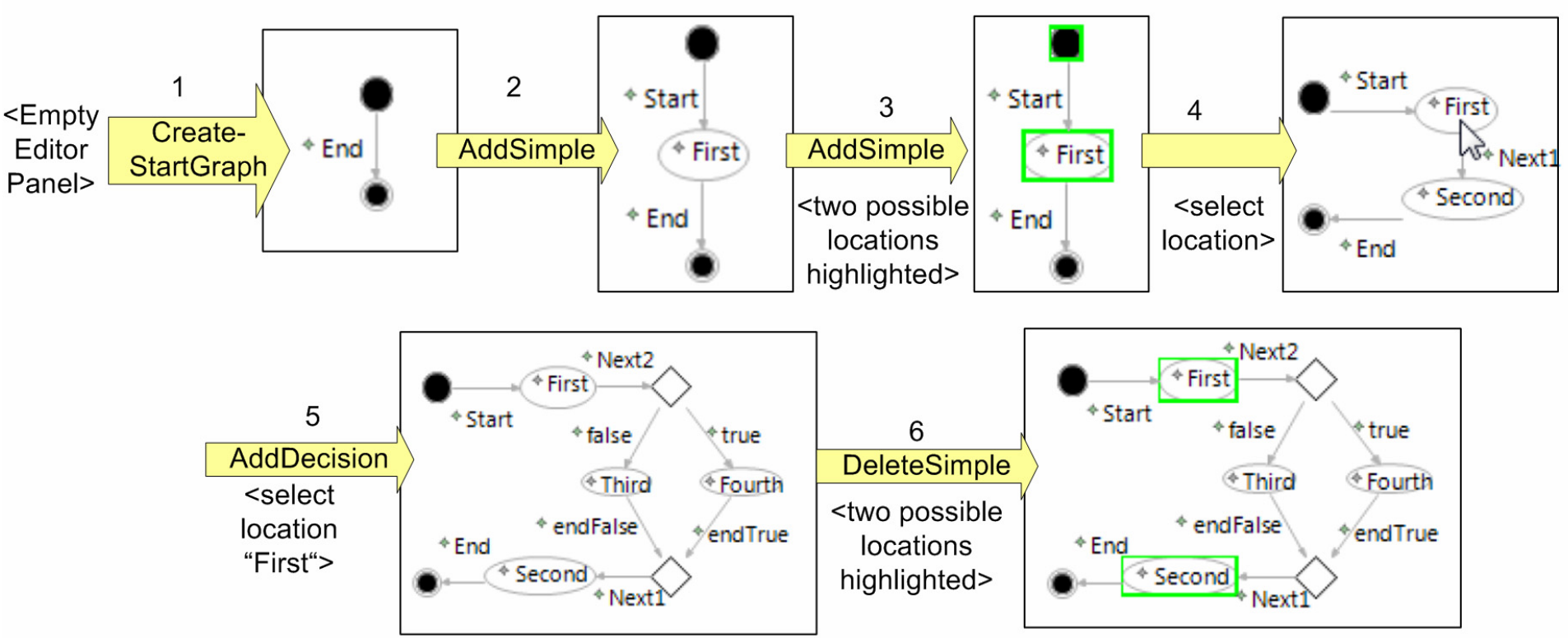
- new kind of entries:
  Trans Rule Mapping
- mapping of a transformations rule on a palette entry
- additional resource:
  EMT model



Generated editor



Application of complex editor commands



Conclusion

- Complex editing commands for GMF editors
  - *based on graph transformation concepts*
- GMF Extension
  - *allows editing of several diagram elements in one step*
  - *supports command definition by EMF transformation rules on the domain model*
- Rule-based transformations can also be used for
  - *simulation of models*
  - *restructuring (refactoring) of models*

Free download of this GMF extension from:

http://tfs.cs.tu-berlin.de/emftrans/gmftrans