Tutorial 2
OpenOME distilled

On the Requirements, Design and Implementation of the legacy tool
http://www.cs.toronto.edu/~yijun/OpenOME.html
http://sourceforge.net/projects/openome

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1. Historical retrospective

• OME stands for Organizational Modeling Environment. It was part of the Tropos project to support goal-oriented and agent-oriented requirements engineering methodologies (at least 5 years development involving 10 man-year efforts)
• OME has been widely used by more than 130 users (across the globe)
• Every OME user must sign an agreement with Techne because the Knowledge Base was a module protected by the license
• To enlarge the user-base, we decide to open-source it last year ... OpenOME
2. Requirements and features

- **Is a Graph editor**
  - A graph has elements and links in various form, basic operations include: Load, Save, Insert, Delete, Select, Cut, Paste, Hide, Highlight, Labelling, etc.
  - Multiple views (under development)
- **Supports requirements engineering**
  - Goal-oriented: goal reasoning through label propagation (NFR)
  - Agent-oriented: group goals into agents rationale (i*)
- **Interchanges with other graph editors**
  - Semantic Web queries: Protégé (OWL)
  - Layout algorithms: AT&T Graphviz (DOT)
  - Scalability: Microsoft Visio (XSLT) .............under development
  - Model-driven development: Rational Rose (EMF/XMI)
  - Model-Driven Development: Eclipse Modeling Framework (XMI) .............under planning

3. Design: MVC

- **Model-View-Controller design pattern**
  1. **Model**: The Telos Knowledge Base representation and OME models
  2. **View**: Graph presentation
  3. **Controller**: commands in menu, toolbar and various methods

3.1 Model

- **ModelManager**
- **Telos**: requirements as knowledge
- Telos as metamodelling language
  - Level: Token, SimpleClass, MetaClass, MetaMetaClass, Builtin classes ...
  - *.*:L X IN {Y} ISA {Z} WITH {attribute,U:V}*
  - ER, NFR(vgraph), ISTAR, GRL
  - From jtelos.dll to TelosParser
  - Export Telos model to other models: JTelosUtil.java OTelos (ConceptBase), Protégé (KnowledgeBase)
  - TODO: Eclipse Modeling Framework (XMI)

3.2 View

- GraphicView is a collection of GVElement, GVLinks, maps the tokens in Telos model into geometric shapes in the presentation
  - GVE$Record, GVL$Record ...encodes the location of the shapes, states of the presentation, etc. They are saved as SerializedViewObjects
- **GVElement, GVLink**
  - Visitor pattern and Decorator pattern
  - They are extended by the OME plugins
3.3 Controller

- **OMETab**: run it as standalone Java application, or as a plugin for Protégé or Eclipse (under development)
- **GraphViewFrame** and **OMEDefaultPlugin**: control the menu, toolbar and methods
  A method is interpreted as commands
  – No argument command: Layout
  – With one argument: Insert, …
  – With two arguments: CreateLink, Move …
  – With multiple arguments: Select, …
- They are extensible using the OME plugins

4. Implementation issues

- **OME**: 90% Java + 10% C/C++
- Recently
  – OpenOME: 99% Java + 1% scripts
  – Use the Eclipse IDE
  – CVS, bug report: host at SourceForge
  – 3 research developers + some contribution from you

5. Relation to your project

- It is the graph editor client of the choice for your OmniGraphEditor project. You may choose additional open-source graph editor as bonus point (such as Dia, Visio, Eclipse GEF etc.), but that is not recommended because of the large efforts
- Opportunities:
  – You may add junit test cases to the code base to reveal bugs (publish it to the bug tracking system) and fix them (+5%)
  – You may apply design patterns, refactoring techniques on this legacy code base, showing as an improved complexity metrics (+2.5%)
  – You may tune the performance of the system to speed up the display, load/save for scalable graphs (+2.5%)
- Don’t forget your major project task (up to 100%)!
  – To study the editor methods in the OpenOME and adapt them to the OmniGraphEditor web service.