

Pounamu: a meta-tool for multi-view visual language environment construction

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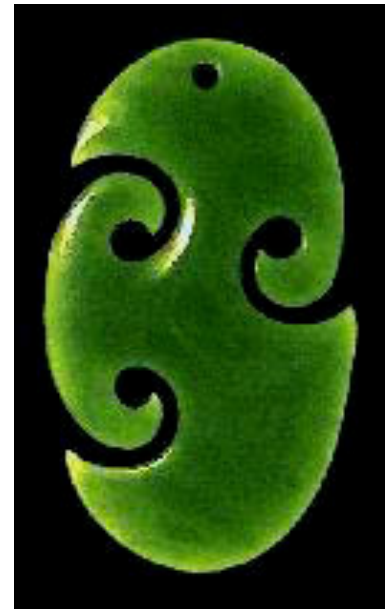
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Introduction

1. What is Pounamu?
2. Pounamu features and overview
3. Pounamu tools.
4. Using tools produced by Pounamu.
5. Example tools produced by Pounamu.
6. Pounamu extensions.
7. Future work

What is pounamu?

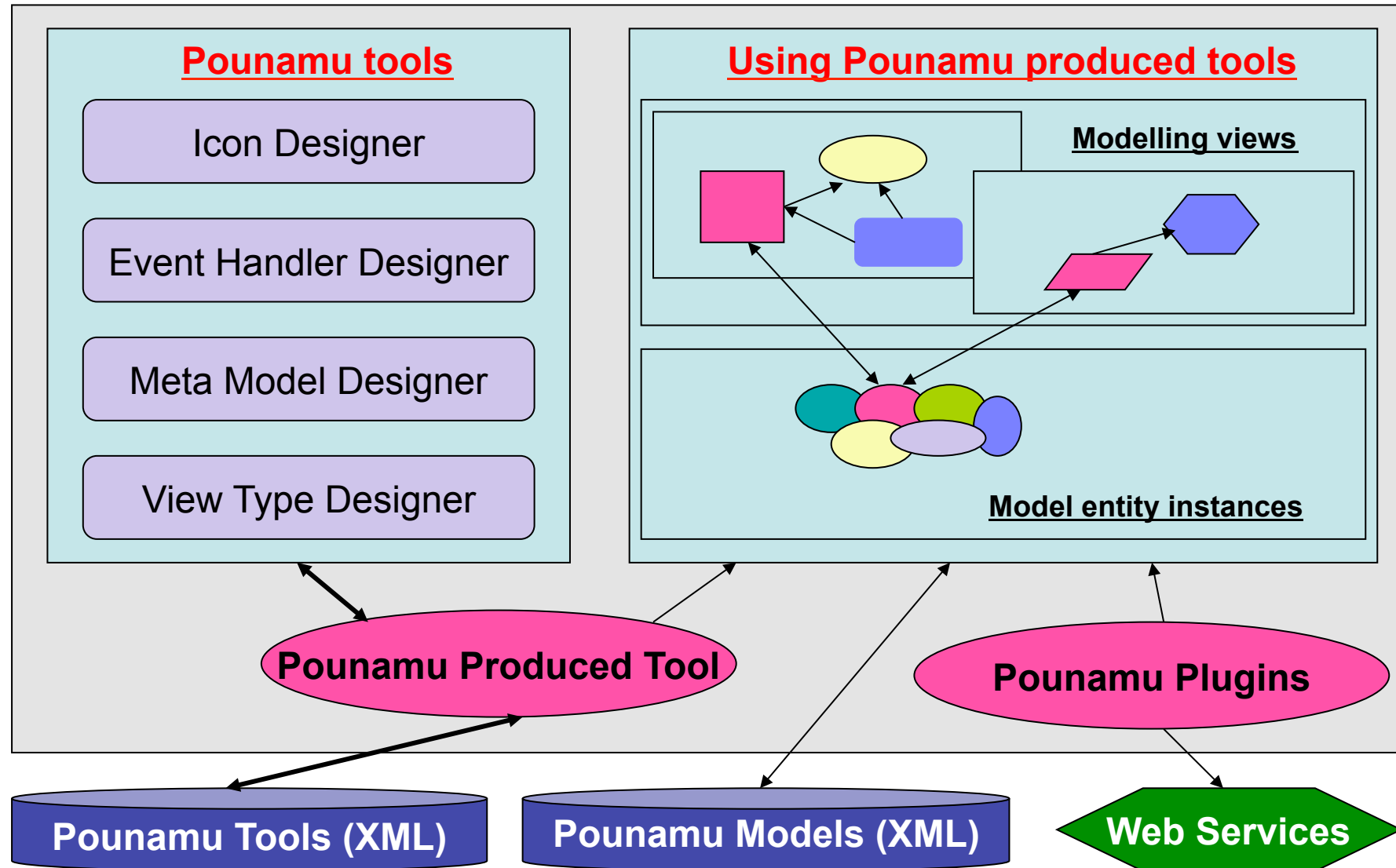
- *Pounamu* is the Maori word for greenstone jade, used by Maori to produce tools, such as adzes or knives, and objects of beauty, or taonga, such as jewellery.
- *Pounamu* is a meta tool for specification and generation of multiple view visual tools.



Pounamu features

- Flexible
- Dynamic
- Easy to use
- Provides rapid tool prototyping
- Extensible

Pounamu overview



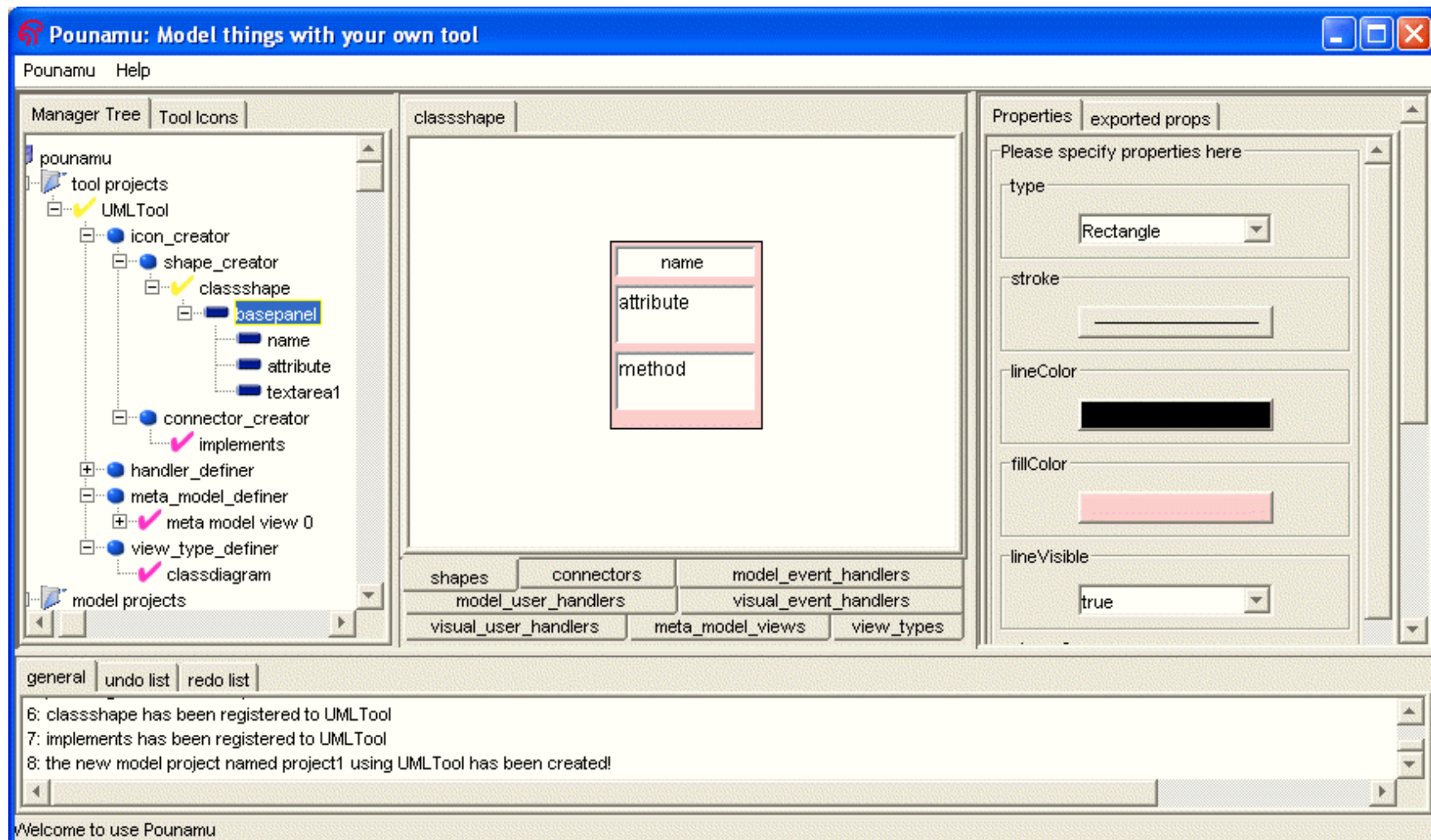
Pounamu tools

- Pounamu icon designer
 - Shape designer
 - Connector designer
- Pounamu meta model designer
- Pounamu handler designer
- Pounamu view type designer

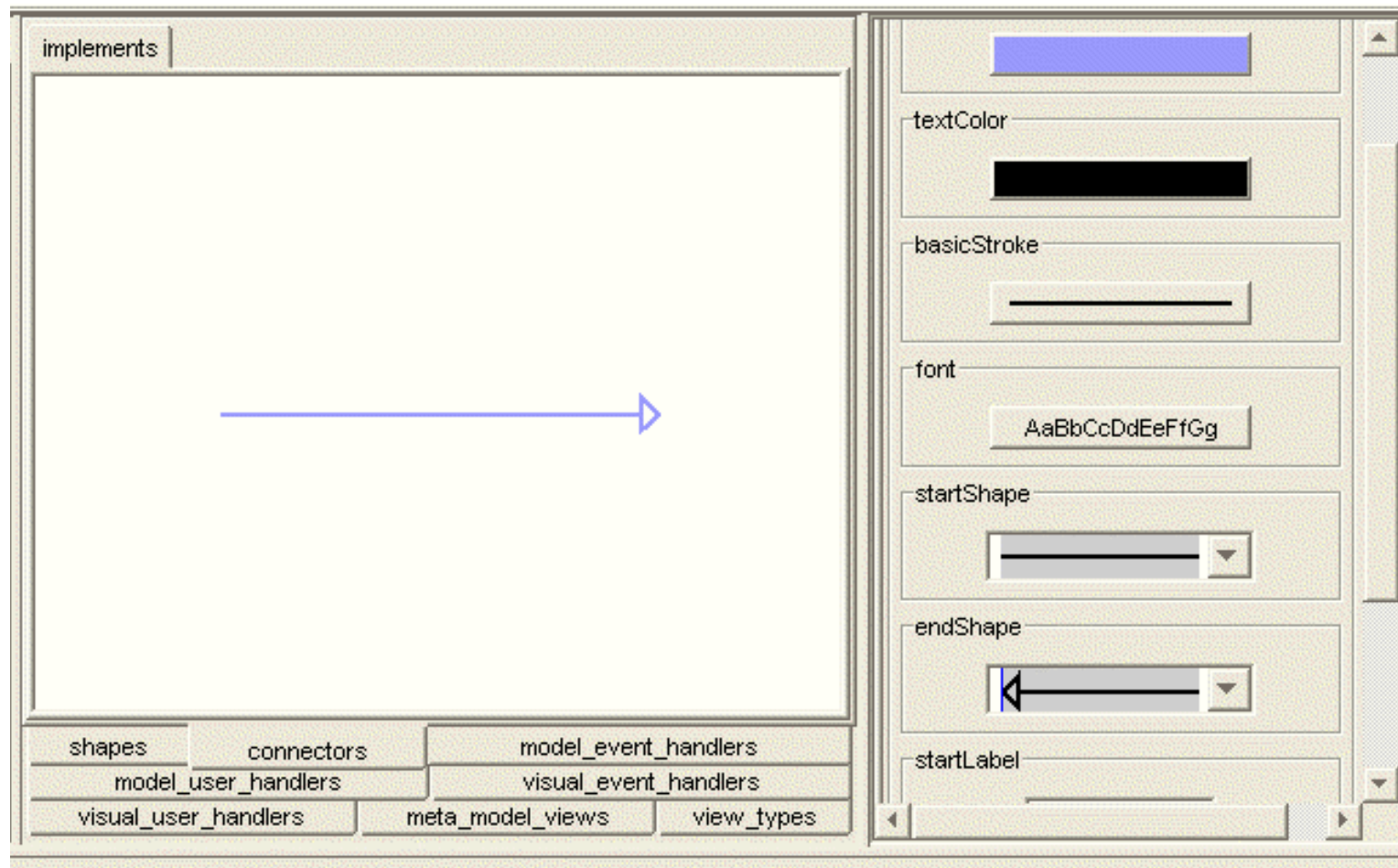
Pounamu tools

- Pounamu icon designer
 - Shape designer: design shapes using Java Swing components, layout managers, geometric shapes, images, borders.
 - Connector designer: design inter-shape connectors by specification of line format, and shapes, and labels or edit fields associated with the connector's ends or centre.
- Pounamu meta model designer
- Pounamu handler designer
- Pounamu view type designer

- Pounamu Shape designer



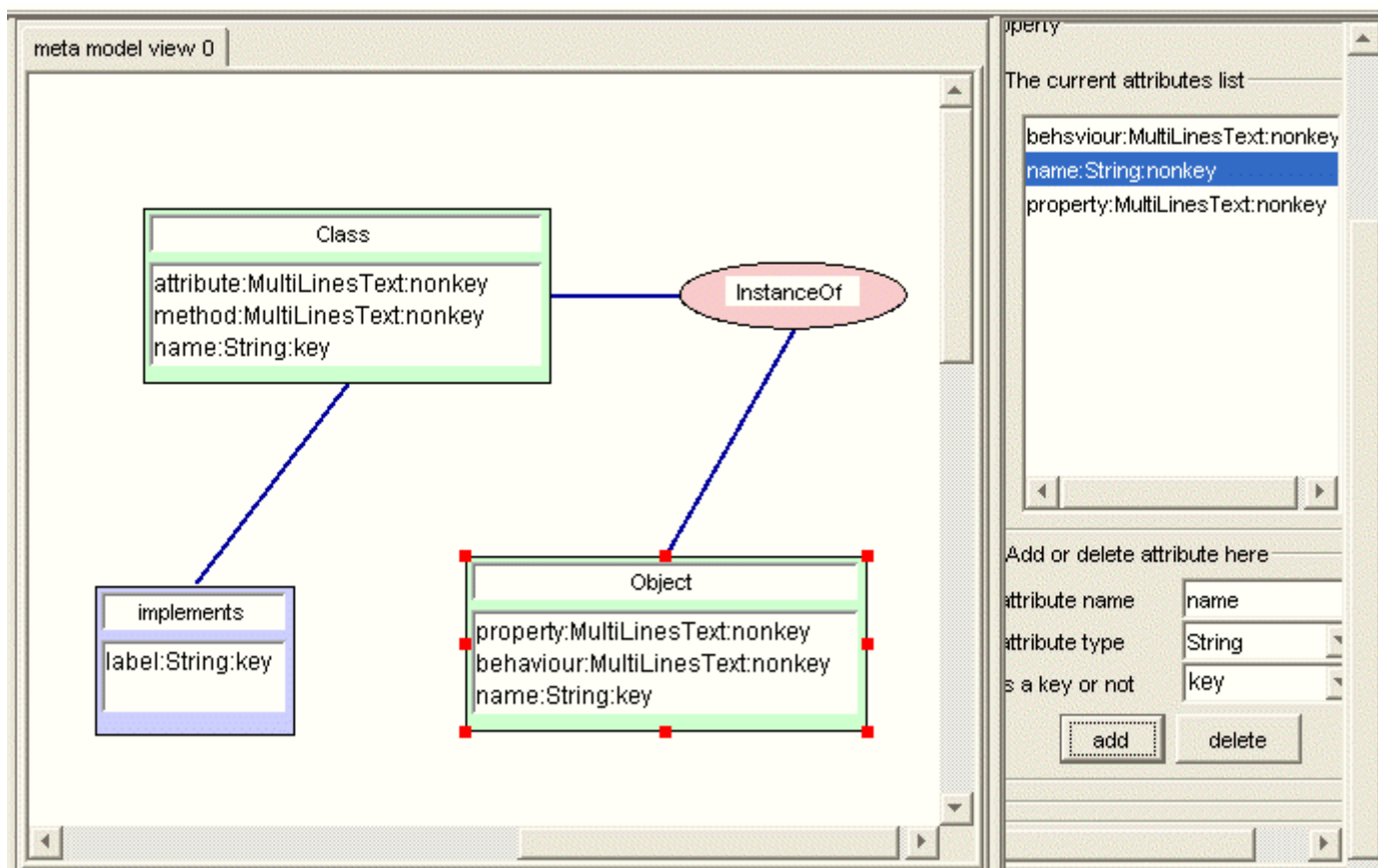
- Pounamu connector designer



Pounamu tools

- Pounamu icon designer
 - Shape designer
 - Connector designer
- Pounamu meta model designer
 - Specify the underlying tool information model using an Extended Entity Relationship (EER) model as its representational metaphor
- Pounamu handler designer
- Pounamu view type designer

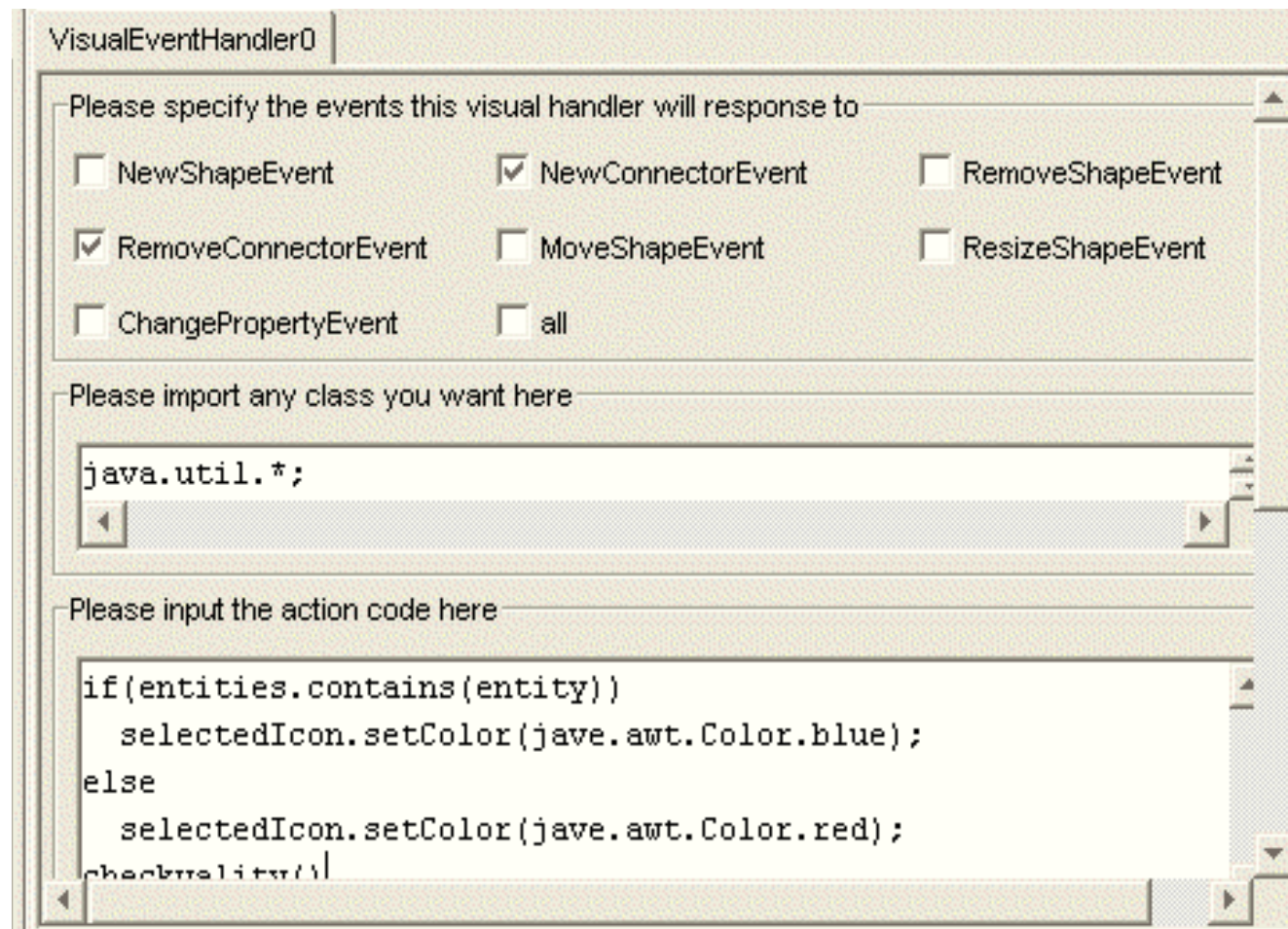
- Pounamu meta model designer



Pounamu tools

- Pounamu icon designer
 - Shape designer
 - Connector designer
- Pounamu meta model designer
- Pounamu handler designer
 - handlers add complex behaviour to a tool via an Event-Condition-Action (ECA) model
 - 4 types of handlers based on
 - How the handler will be triggered (event or user)
 - What level the handler will work in (visual or model)
- Pounamu view type designer

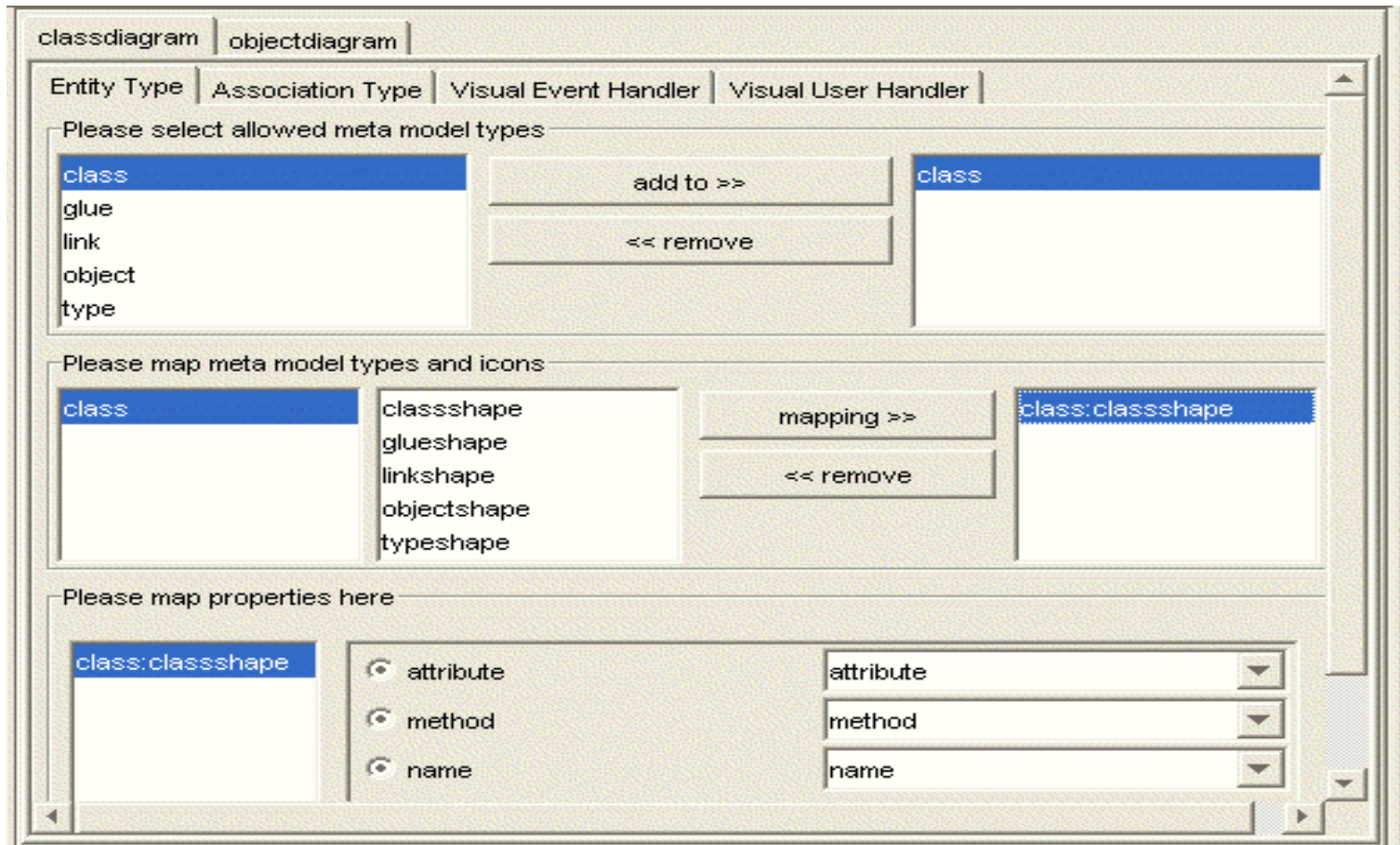
- Pounamu handler designer



Pounamu tools

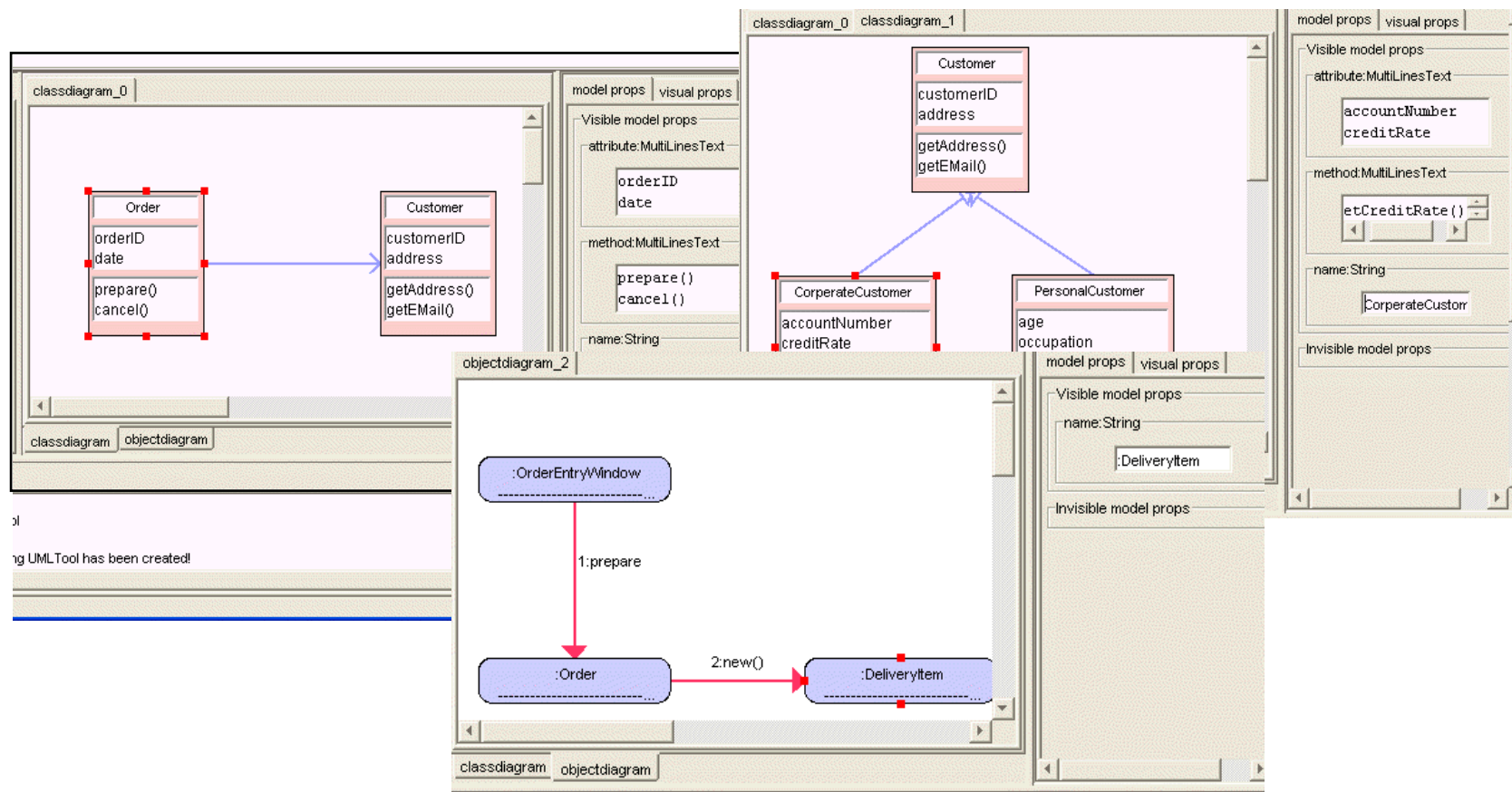
- Pounamu icon designer
 - Shape designer
 - Connector designer
- Pounamu meta model designer
- Pounamu handler designer
- Pounamu view type designer
 - define a visual editor and its mapping to the underlying information model

- Pounamu view type designer



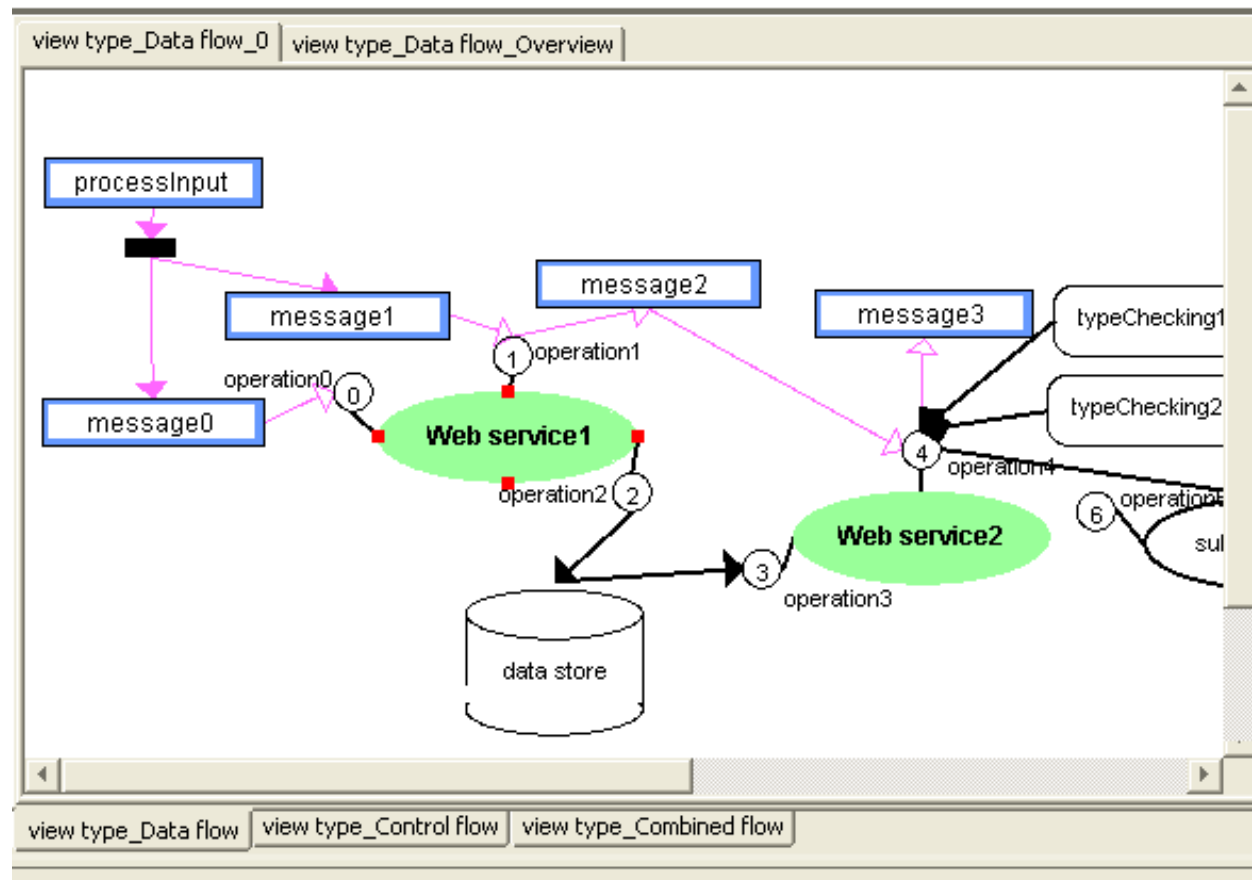
Using tools produced by Pounamu

- A simple UML tool in use



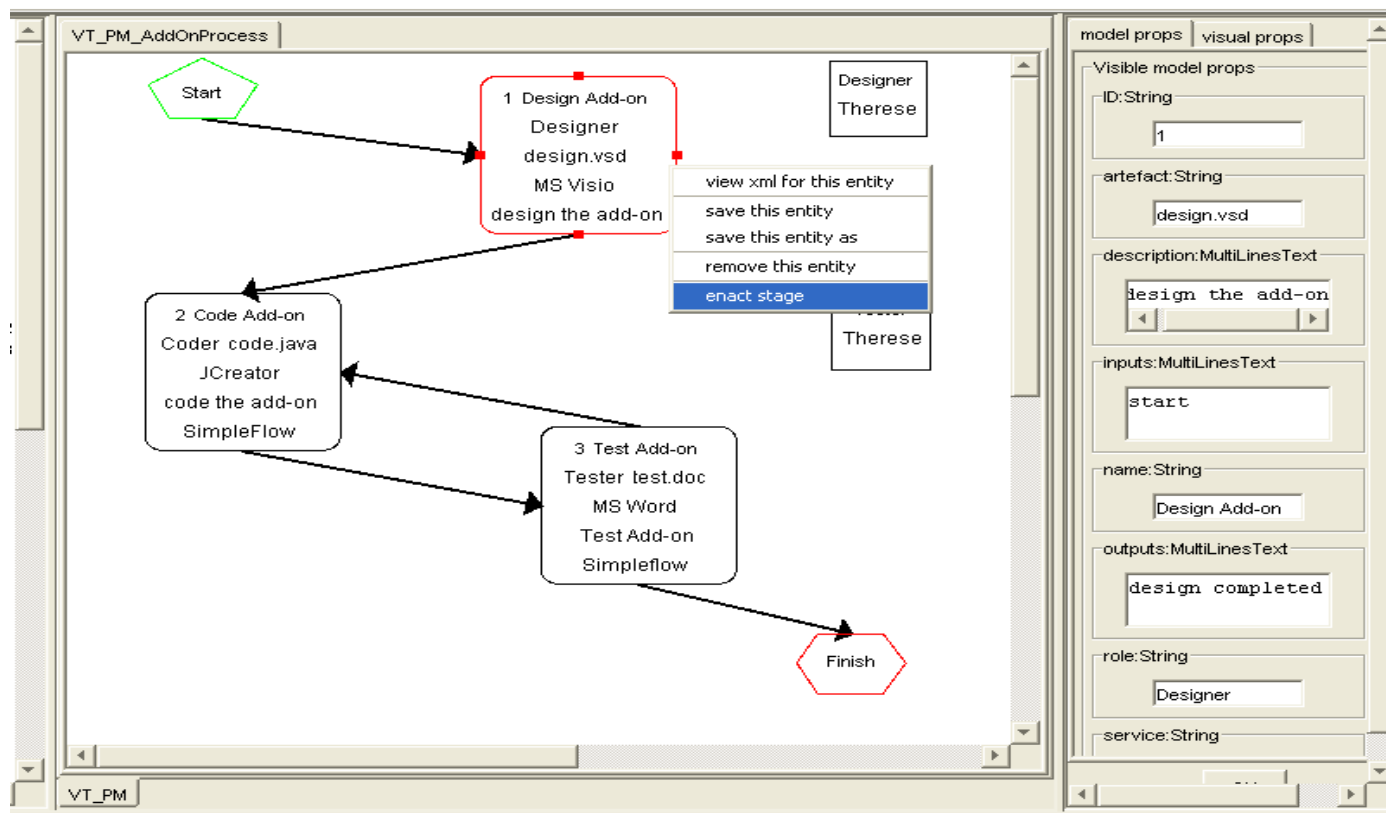
Example tools produced by Pounamu

- A web services composition tool



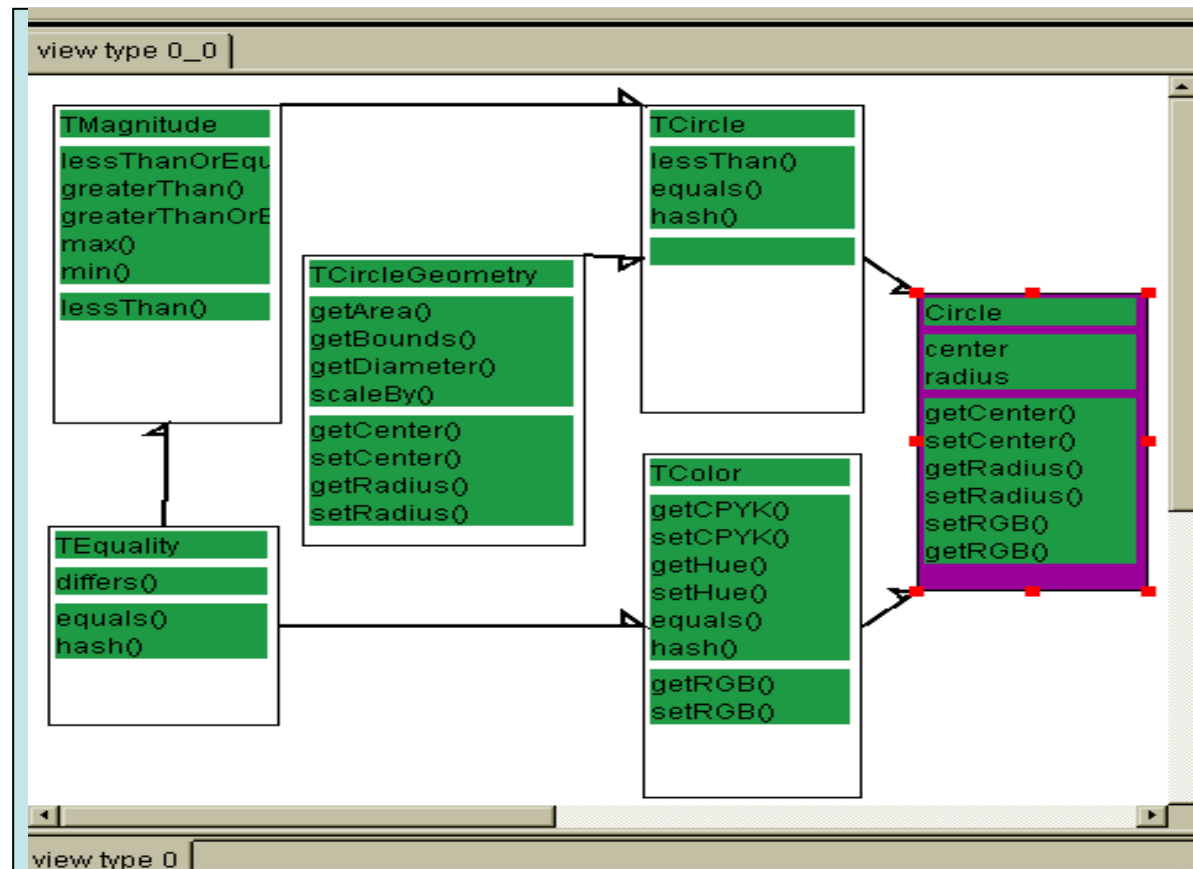
Example tools produced by Pounamu

- A process modelling tool



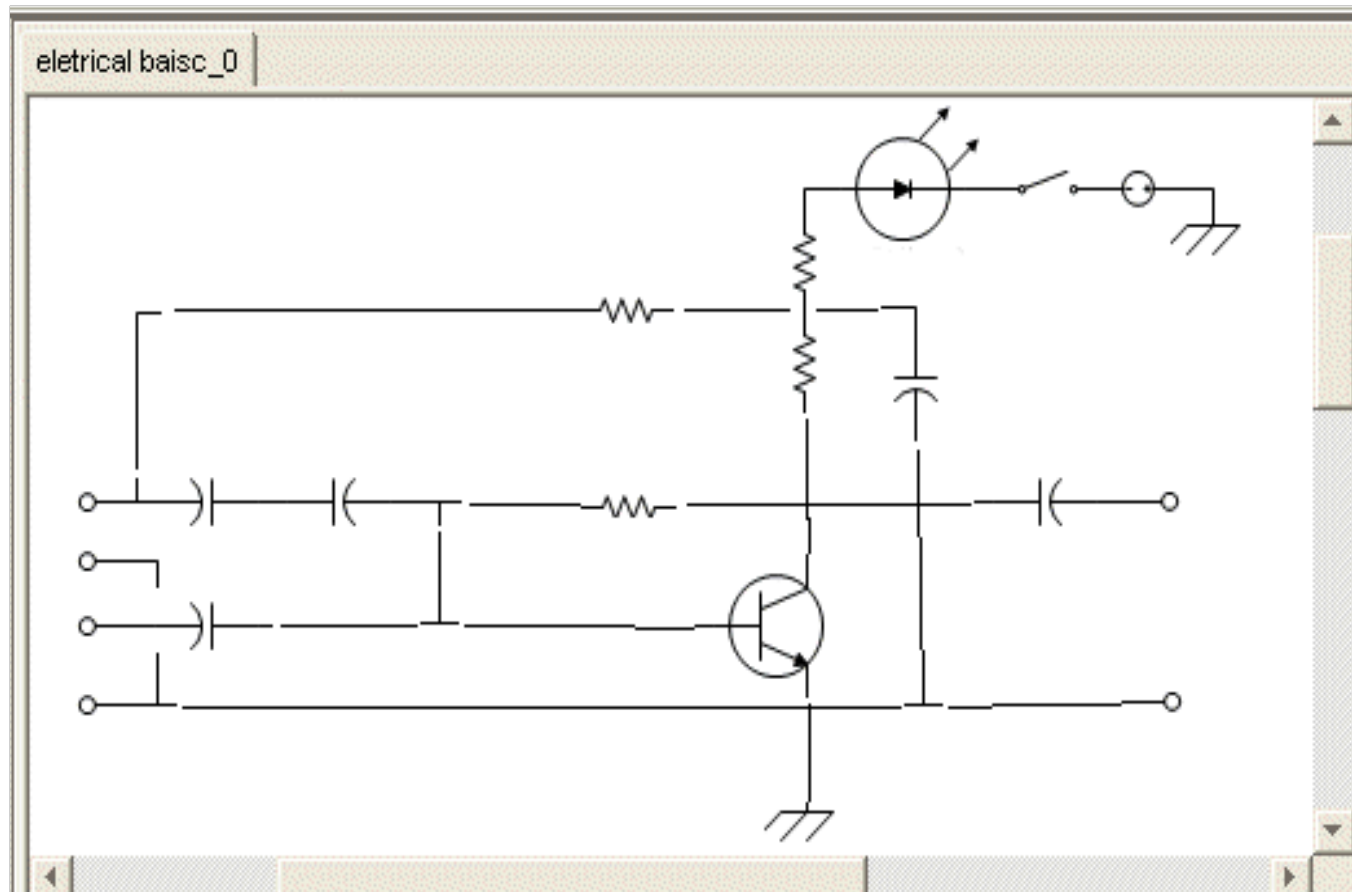
Example tools produced by Pounamu

- Traits modelling tool.



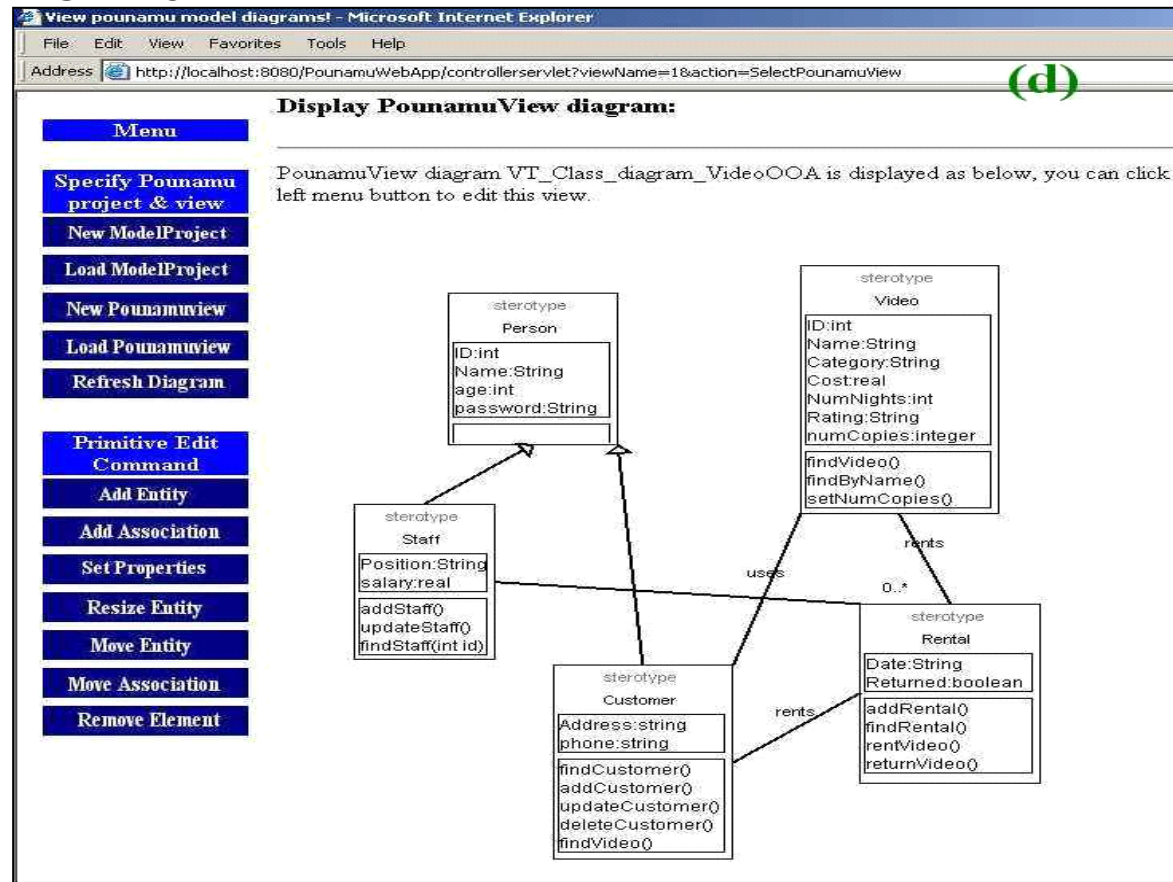
Example tools produced by Pounamu

- Pounamu circuit designer tool



Pounamu extensions

- Thin client, web-based editing interface for Pounamu



Future work

- The incorporation of generic sketch and voice interfaces.
- The development of a tool to visually specify event handlers.
- CSCW capability
- Turn Pounamu into a plugin for eg MSOffice or Eclipse.

References

- Zhu, N., Grundy, J.C. and Hosking, J.G., Pounamu: a meta-tool for multi-view visual language environment construction, In Proceedings of the 2004 International Conference on Visual Languages and Human-Centric Computing, Rome, Italy, 25-29 September 2004, IEEE CS Press, pp. 254-256.
- Grundy, J.C., Hosking, J.G., Cao, S., Zhao, D., Zhu, N., Tempero, E. and Stoeckle, H. Experiences developing architectures for realising thin-client diagram editing tools, Software – Practice and Experience, vol. 37, no.12, Wiley, October 2007, pp. 1245-1283.
- Zhu, N., Grundy, J.C., Hosking, J.G., Liu, N., Cao, S. and Mehra, A. Pounamu: a meta-tool for exploratory domain-specific visual language tool development, Journal of Systems and Software, Elsevier, vol. 80, no. 8, pp 1390-1407.
- Grundy, J.C., Hosking, J.G., Zhu, N. and Liu, N. Generating Domain-Specific Visual Language Editors from High-level Tool Specifications, In Proceedings of the 2006 IEEE/ACM International Conference on Automated Software Engineering, Tokyo, 24-28 Sept 2006, IEEE.
- Zhu, N., Grundy, J.C. and Hosking, J.G. Constructing domain-specific design tools with a visual language meta-tool, CAiSE 2005 Forum, Portugal, June 2005, Springer.
- Cao, S., Grundy, J.C., Stoeckle, H., Hosking, J.G., Tempero, E., Zhu, N. Experiences Generating Web-based User Interfaces for Diagramming Tools, In Proceedings of the 2005 Australasian User Interfaces Conference, Jan 31-Feb 3, 2005, Newcastle, Australia, Conferences in Research and Practice in Information Technology, Vol. 40.