A Summary of Pounamu

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Abstract. Pounamu is a new meta-model tool for developing Domain-Specific Visual Language environment. This report present a brief overview of Pounamu tool based on the reading and understanding of the original paper of Pounamu.

1 Introduction to Pounamu

Pounamu is the Maori word for greenstone jade, used by Maori to produce tools. Similarly, software Pounamu is a meta-tool for developing Domain-specific visual language(DSVL) tools, which was developed by Austin University of New Zealand in 2003. Pounamu aims to support users to fast design, prototype and evolve tools supporting a wide range of visual notations and environments.

2 Motivation

As the author stated, the motivation of building Pounamu is to create a meta-tool which containing such function:

- Visual meta-tools to specify DSVL meta-model entities and associations.
- Visual meta-tools to specify simple and complex shapes and connectors.
- Meta-tools to specify constraint handling for both view editing and model manipulation.
- Generated tools are able to exchange view and model information structures with other tools
- Generated tools are able to save and load models and views and to share these saved representations among multiple DSVL tools, ideally via a version control server.
- Multiple users are able to collaboratively edit generated DSVL tool views using synchronous groupware support, including group awareness support.
- Generated DSVL tool diagrams are able to be accessed and edited across a variety of platforms, including web browsers, PDAs and mobile phones.

3 Implementation

Pounamu is implemented in Java, and import Xerces XML libraries, Swing user interface libraries and Java web services development toolkit. As the author stated:

- The Java JAX XML API and Xerces Document Object Model (DOM) are used to represent both tool specification deta and modelling project data as XML data structures.
- The Java Swing package is used to represent model instances.
- The Java web services development toolkit is used to build a web services API for Pounamu, which enable external tools to access Pounamu model and diagram information.

4 Components

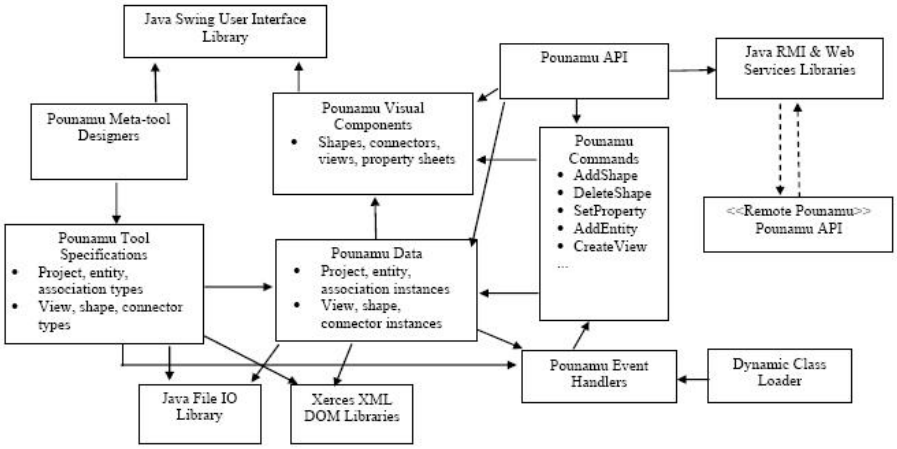

Fig. 1. Pounamu Component Structure

Pounamu has four main components:

- Shape Designer: define the visual language notation components, which consist of Java Swing panels, with embedded sub-shapes, such as labels, single or multi-line editable text fields (with formatting),layout managers, geometric shapes, images, borders, etc.
- View Designer: define view for graphic display and editing of information. Each view type consists of the shape and connector types that are allowed in that view type, together with a mapping from each such element to corresponding metamodel element types.
- Meta-Model Designer: define the tool's meta-model, which contains two types, entity and assosiation.
- Event Handler Designer: define event handler to control behavior semantics. Handlers are typically used to add constraints, complex mappings, back end data export or import e.g. code generation, and access to remote services to support tool integration and extension.

5 Features

As the reference paper presents, Pounamu contains some special advantages in comparison with other modelling tools:

– Pounamu uses the Jazz ZUI API framework to implement a context and focus metaphor, which provide a zoomable user interfaces as an alternative to the conventional editing interfaces.
– Pounamu has a web-based, thin-client editing interface based on the web services API. The web-based Pounamu view is built by either GIF or SVG images, and it allow user to interact with Pounamu in web browser.
– Pounamu support collaborative editing of diagrams. Pounamu make use of the web services API to send and receive collaborative editing messages between multiple Pounamu instances, and hence the changes by one user are sent to another user and automatically applied.

6 Deficiency

– Pounamu doesn't support high-level syntactic and semantic specification of visual language tools, such as model transformation and graph rewriting.
– All the model data in Pounamu is represented by XML, that makes the model running and loding more time-consuming.

References

1. Nianping Zhu, John Grundy, John Hosking, Na Liu, Shuping Cao and Akhil Mehra.: Pounamu: a meta-tool for exploratory domain-specific visual language tool development. Journal of Systems and Software 80 (2007) 13901407