Integrating a Zoomable User Interfaces Concept into a Visual Language Meta-tool Environment

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Outline

- Pounamu: a multi-view visual meta-tool
- Zoomable User Interfaces
  - what are they, why do we want them?
- ZUI extensions to Pounamu
- Implementation
- Summary

Pounamu

- Pounamu – a meta-tool used to specify and realise domain-oriented, visual language environments

- Pounamu provides tools enabling users to specify:

  - a meta-model that defines the constructs (data structures and semantics) of a visual programming language, and

  - graphical notations to visually represent the syntax of the language

- Pounamu supports multiple views

  - Both same notation and different notation

Pounamu Multi-view Example

consistency
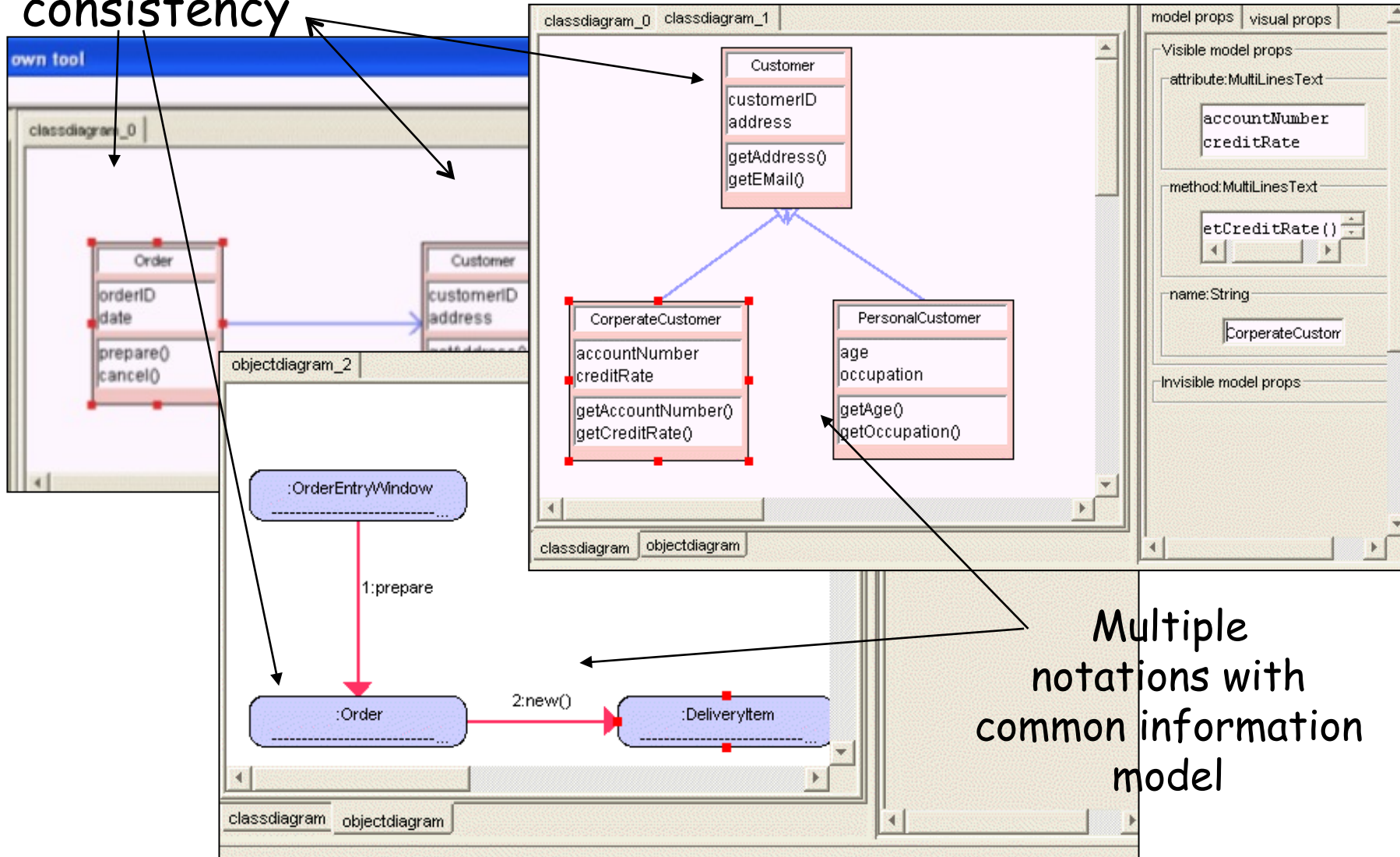
Multiple notations with common information model

Why Zoomable User Interfaces ("ZUIs")??

- Visual languages often have a major problem with lack of screen real estate – Pounamu no exception
- Multiple views often used to solve the problem by modelling large systems as smaller parts
- Several limitations:
  - Diagrams can only be broken up so much else become too unstructured
  - Lose context when move between views
  - Effort of breaking up/maintaining multiple views can be great
- A complementary approach is to use "Zoomable User Interfaces"…

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What are ZUIs?

- Zoomable User Interfaces allow users to focus in/out on view content
- Various kinds:
  - a Radar view (whole diagram zooming facilities) – zoom in/out whole diagram
  - Zoomable view (part diagram and individual element zooming) – zoom in/out selection
  - Split view (Zoomable selection element zooming) – copy selection and zoom in/out
  - Focal view – copy selection from split view
- We added prototypes of these to Pounamu views…

Pounamu ZUIs
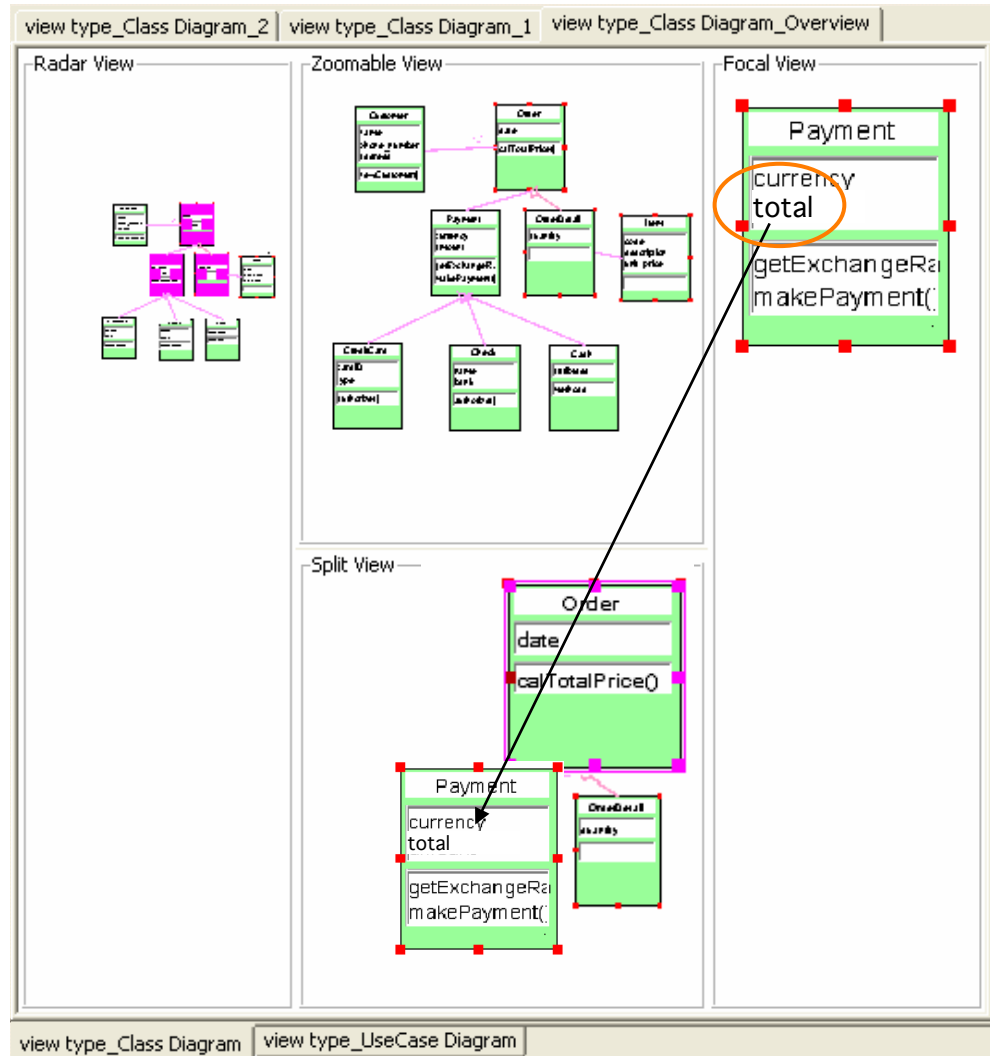
- The ZUI views support:
- Zooming-in and zooming-out of displayed objects

  - Selection of a single or a particular group of objects

  - Panning objects into any position within the zoomable canvas that they belong to

  - Relocating single objects into ZUI views

  - Scaling of an object into a bigger or smaller size

  - Consistent editing of objects between ZUI views and the existing multi-views

Pounamu ZUIs

- All enhanced views support zooming-in and zooming-out of the Pounamu modelling elements in zoomable panels

- ZUIs support different levels of design overview with fewer details, supplementing the existing multi-view User Interfaces in Pounamu

- ZUIs do not affect any existing multi-view interface features and behave like add-ons

- Users can switch between the ZUIs and the existing multi-views in an uninhibited manner

- Users may choose not to use the ZUIs at all as they have been designed as a plug-in

Implementation

- We used the Jazz framework to add new ZUI capability to Pounamu views

- The Pounamu ZUI views have been implemented via specialised Pounamu modeller view classes

Summary

- We have introduced ZUIs into a visual language meta-tool, providing enhanced view navigation & management

- ZUIs support flexible and dynamic design overviews and view element focus

- ZUIs address the lack of screen space and display capability in complex views

- Our experiences indicate that these capabilities enhance the visual language tools generated by the meta tool

- Need for a new ZUI building toolkit and improved ZUI control and navigation support

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