

# An architecture for generating web- based, thin-client diagramming tools



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# Project Description



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- Plug-in components for meta-tool to support web-based diagramming
- Allow display & edit of diagrams
- GIF and SVG diagram rendering supported
- Proof-of-concept system + examples built

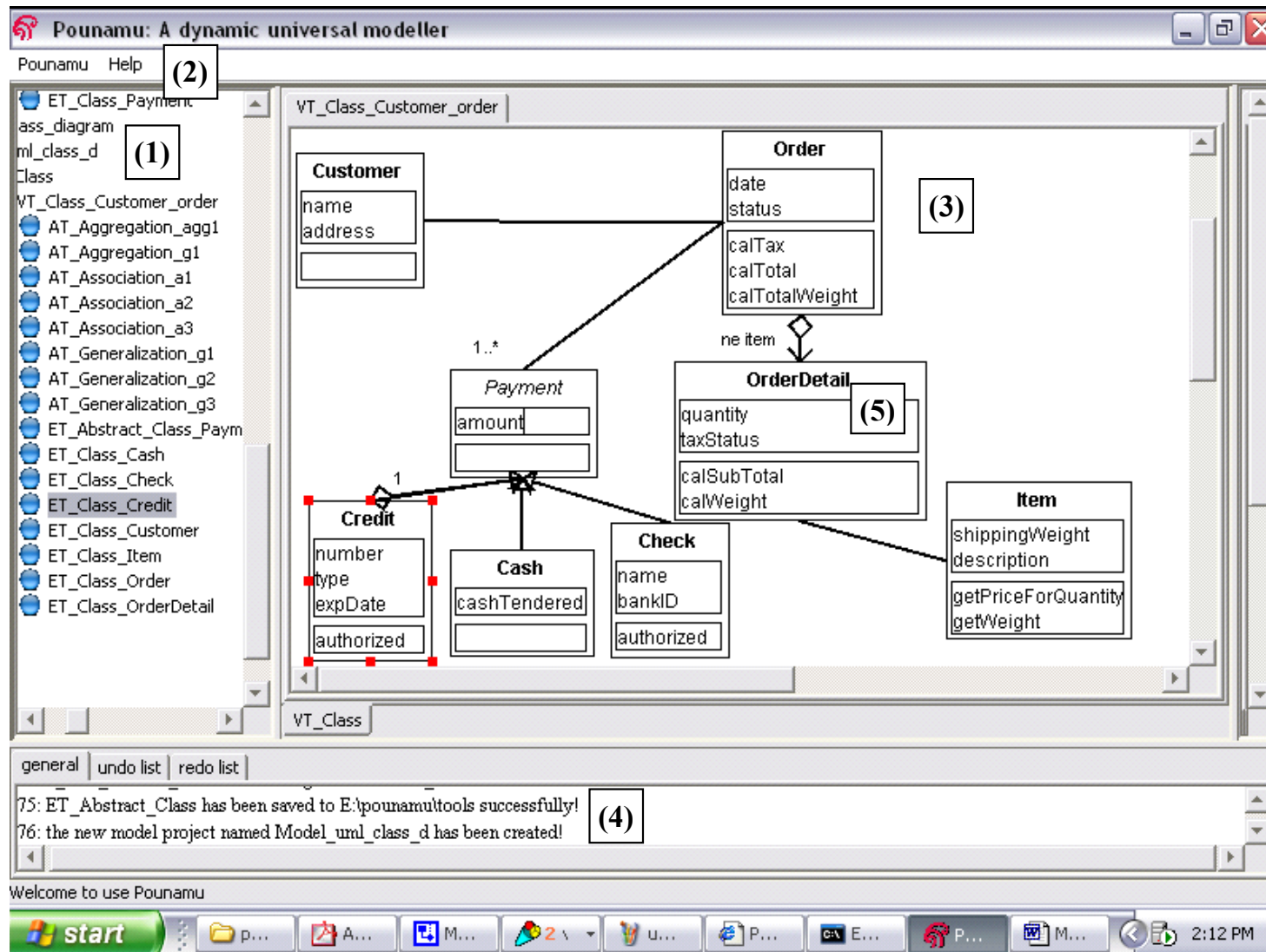
# Motivation



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- Most software tools with diagrams use thick-client user interfaces
- Problems:
  - Have to install on everyone's PC
  - Have to upgrade on all machines
  - Learning curve e.g. complex CASE tools
  - Collaborative work requires complex infrastructures

# Example



# Thin-client Tool



Tools & models

Editing types

Editing modes

The screenshot shows a web browser window titled "Edit model element properties! - Microsoft Internet Explorer". The address bar shows a local URL: `http://localhost:8080/PounamuSVGApp/controllerservlet?action=EditProperty`. The page content includes a "Main Menu" section with a "Specify a Pounamu tool" button and a "Load Tool" button. Below this is a "Specify Pounamu project & view" section with buttons for "New ModelProject", "Load ModelProject", "New Pounamuvview", "Load Pounamuvview", and "Refresh Diagram". The "Available Editing Modes" section has "Standard Editing" (checked), "Multi-Editing", and "Script Enabled". The "Primitive Edit Command" section has "Add Entity", "Add Association", "Set Properties", and "Resize Entity". A "Cancel & Back" button is also present. The main area displays a UML class diagram with classes: Customer (attributes: id:String, name:String, address:String; methods: findCustomer(), addCustomer(), getVideos()), Video (attributes: id:Integer, title:String, cost:Double; methods: findVideos(), addVideo(), rentVideo()), Staff (attributes: id:Integer, name:String; methods: findStaff(), updateStaff()), and Rental (attributes: dateRented:Date, numDays:Integer; methods: addRental(), returnVideo()). An association labeled "video" connects the Video class to the Rental class. A dashed arrow points from the "Web diagram" label to the diagram.

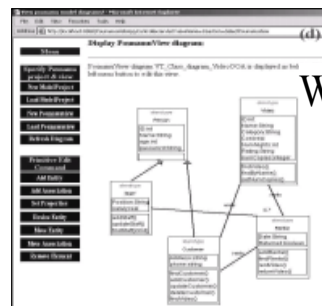
Web diagram

# Architecture

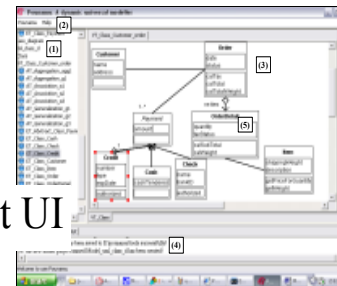


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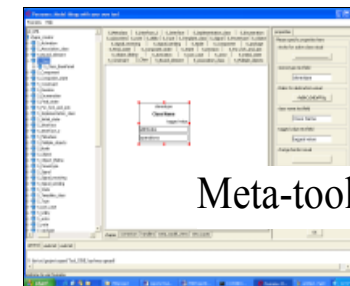
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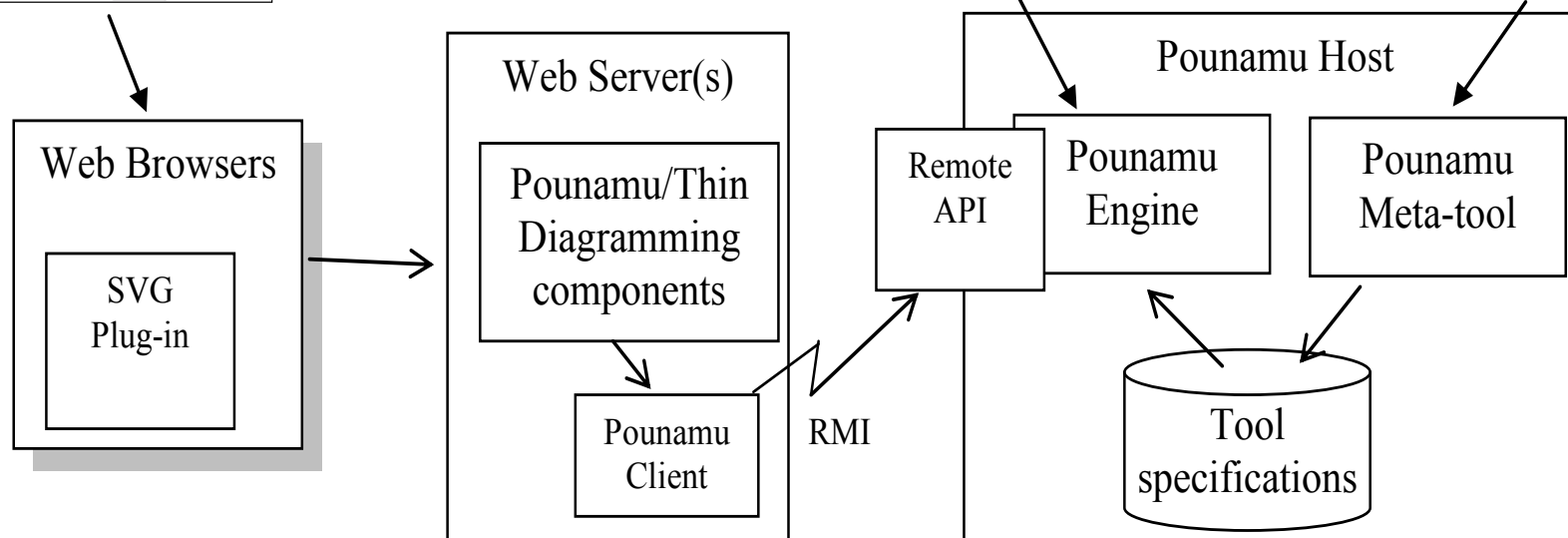
Web-based UI



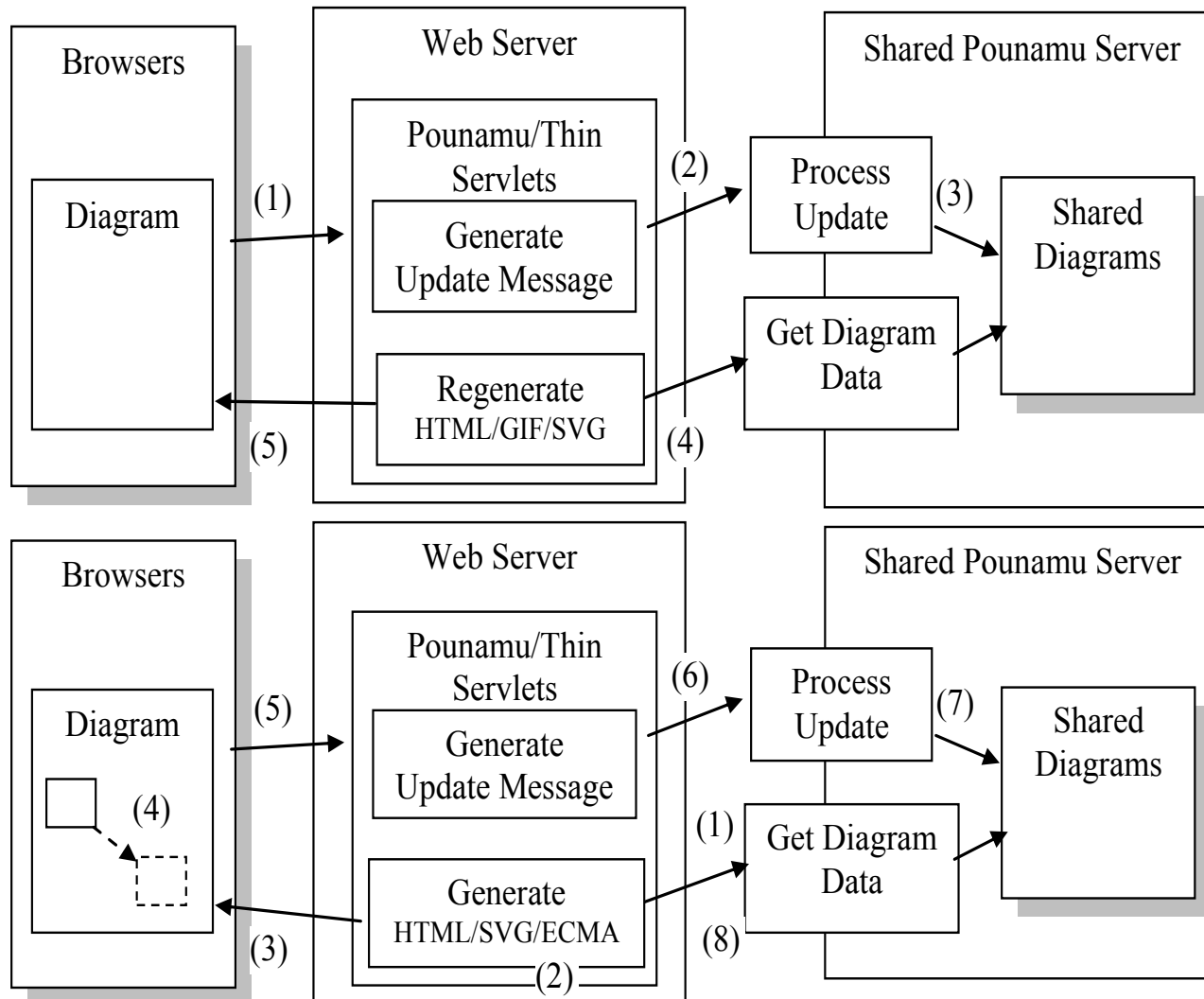
Thick-client UI



Meta-tools UI



# Editing Approaches



Fully  
server-side  
processing

Client-side  
scripting

# Editing Example (1)



**1. Select tool/project**

**2. Select/create diagram**

**3. Select mode/click to add**

**4. Select mode/click to select/edit properties**

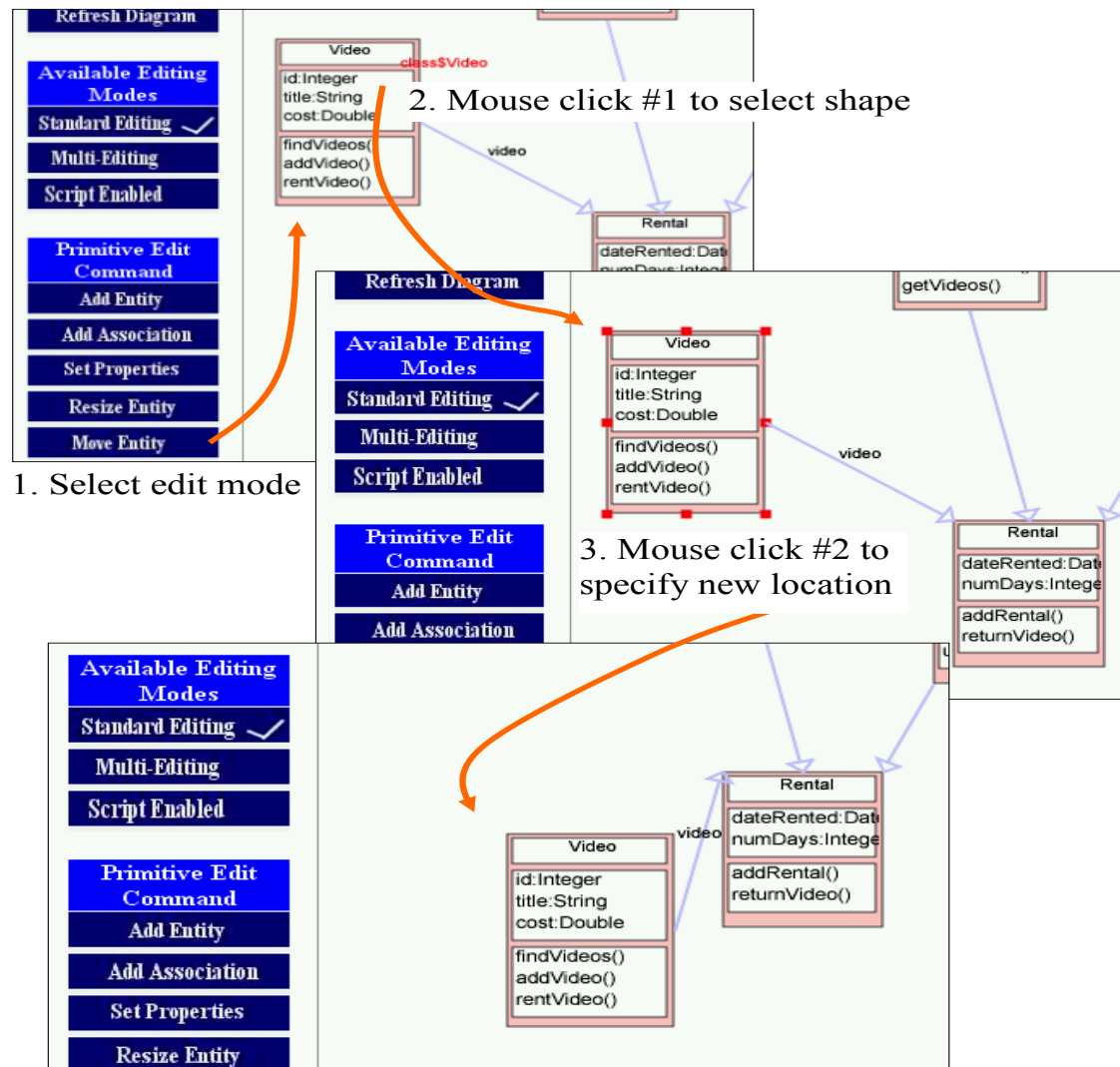
**Main Menu** Display the updated PounamuView diagram:  
The result of your previous editing action on the PounamuView Diagram 1 left menu bar for another editing action.

**Available Editing Modes**

PropertyName	PropertyType	PropertyValue
<b>Model Properties</b>		
attribute	MultiLinesText	id: Integer title: String cost: Double
<b>Method Properties</b>		
method	MultiLinesText	findVideos() addVideo() rentVideo()
<b>Visual Properties</b>		
name	String	Video



# Editing Example (2)





# Evaluation



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- User survey & “cognitive dimensions”
- Fully server-side processing requires multiple interactions for e.g. move, resize - “unusual” for most users
- Client-side scripting improves usability for some users
- Multi-edit buffering supports transactional collaborative work

# Summary



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- Successfully added plug-in servlets to existing thick-client diagramming meta-tool
- Support thin-client diagramming for any specified diagram
- Usability and performance generally good
- Adding plug-in for mobile UIs, sketching- and speech-based UIs...

# References



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