Churrasco: Supporting Collaborative Software Evolution Analysis

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Switzerland

Requirements for (sw evo) tools

- **Meta-model flexibility**
- **Tool accessibility**
- **Modeling results**
- **Support for collaboration**

(Some) Perspectives on evolution

Meta-model flexibility

(Some) Perspectives on evolution

- Change impact analysis
- Co-change analysis
- Aspects evolution
- Evolution metrics
- Architecture recovery
- Effort estimation
- Traceability analysis

Source: ERCIM Software Evolution Working Group

Meta-model flexibility

(Some) Perspectives on evolution

Change impact analysis

Co-change analysis

Aspects evolution

Evolution metrics

Architecture recovery

Effort estimation

Traceability analysis

Source: ERCIM Software Evolution Working Group

Evolution of:

- Bug reports
- Programs
- Architectures
- Test cases
- Log files
- Models
- Documentation
- Meta-models
- Version control information
- Language descriptions
- Requirement specifications
- APIs
- Release histories
- Protocols

Meta-model flexibility

(Limited) Usability of sw evo tools

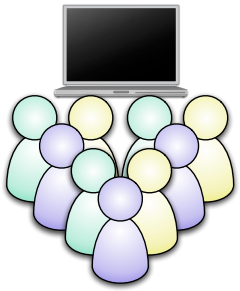
Industrial software

Academic software

Tool accessibility

(Limited) Usability of sw evo tools

Industrial software



Academic software

Tool accessibility

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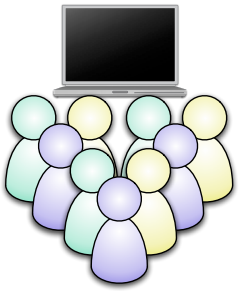
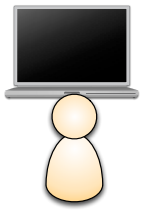


Academic software



Tool accessibility

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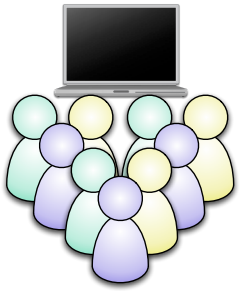

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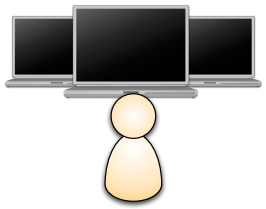

Tool accessibility

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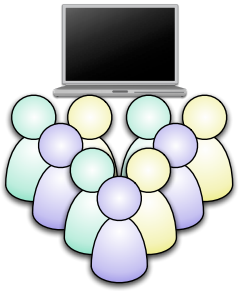
Industrial software



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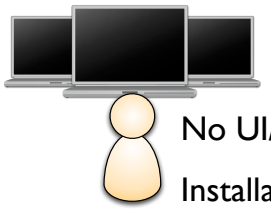


Tool accessibility

No UI/HCI design

Installation/Configuration

Used only by the creators

Exceptions:

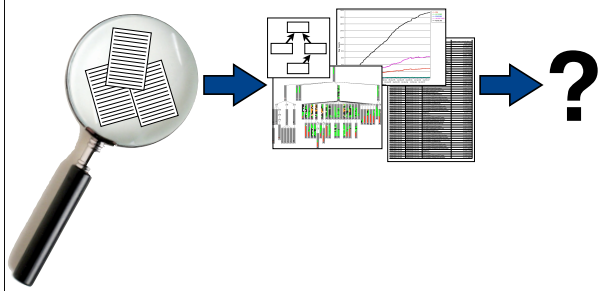
Moose Rigi

Kenyon ...

Where do we store analysis results?

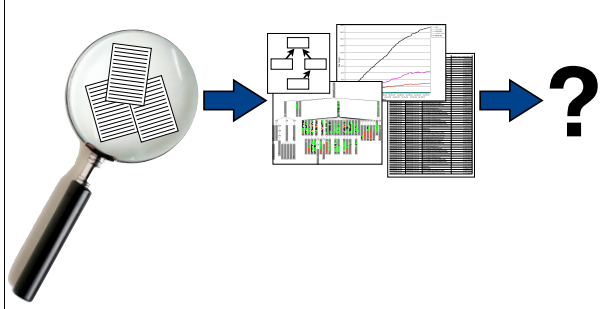
Modeling results

Where do we store analysis results?



Modeling results

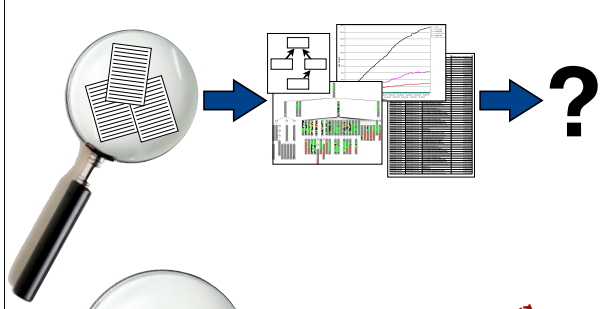
Where do we store analysis results?



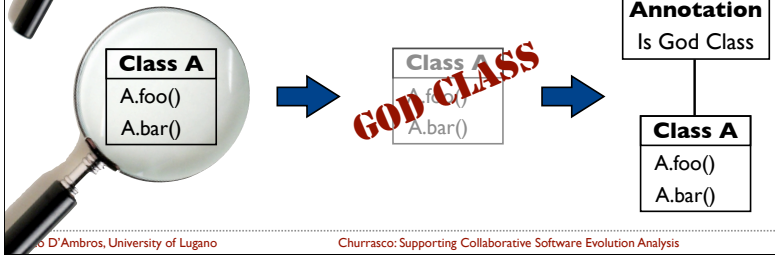
Modeling results

Class A
A.foo()
A.bar()

Where do we store analysis results?



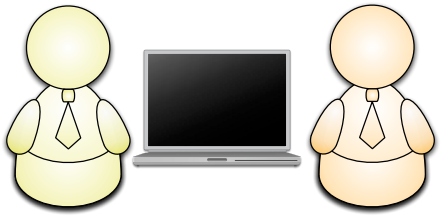
Modeling results



Different people

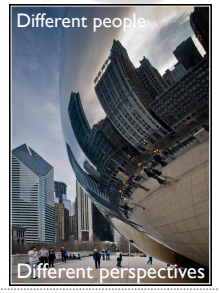
Support for collaboration

Collaboration is...



... combining evolutionary perspectives on a software system

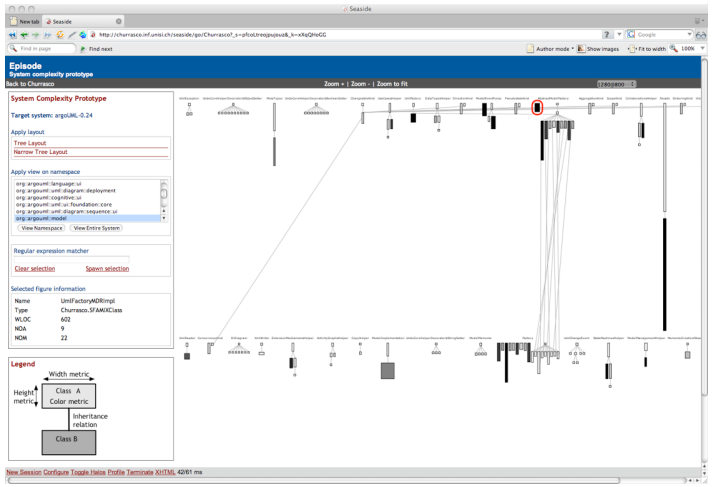
Supports for collaboration



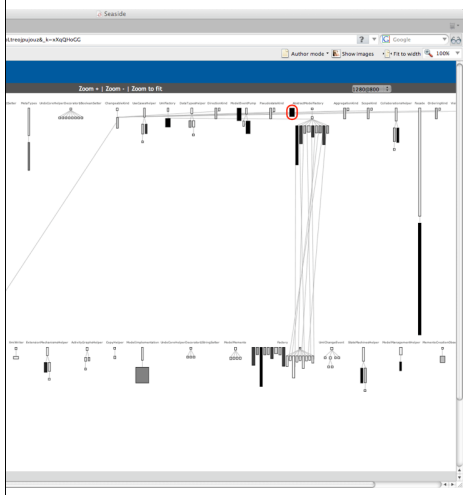
Churrasco

A web-based tool which supports software evolution analysis through visualizations and collaboration through annotations

Churrasco



Churrasco



Features

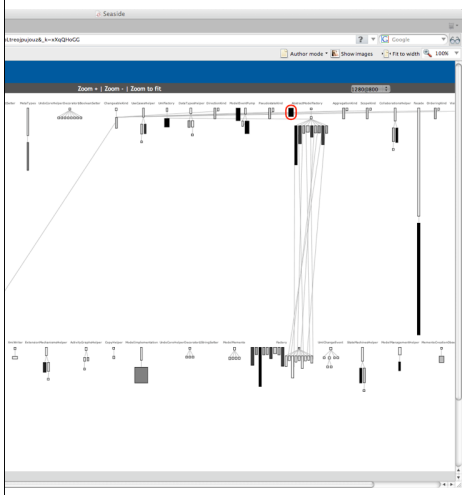
Software visualization

Persistent annotations

Flexible meta-model

Entirely web-based

Churrasco



Features

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Sources

Bugzilla

Bug history

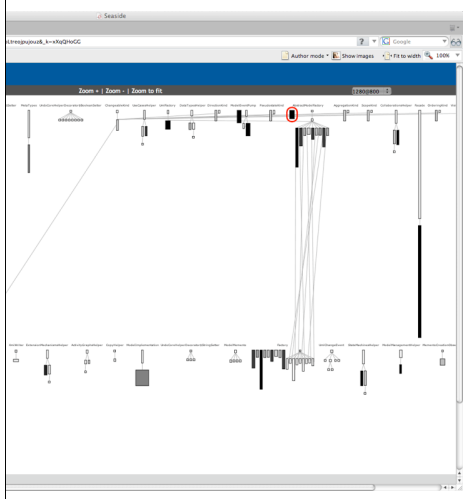
CVS

SVN

Issuezilla

FAMIX

Churrasco



Features

- Software visualization
- Persistent annotations
- Flexible meta-model
- Entirely web-based

Sources	Systems
Bugzilla	ArgoUML
Bug history	Eclipse Jdt
CVS	JEdit
SVN	Gcc
Issuezilla	AspectJ
FAMIX	

Churrasco's architecture

Software System	Model	Analysis

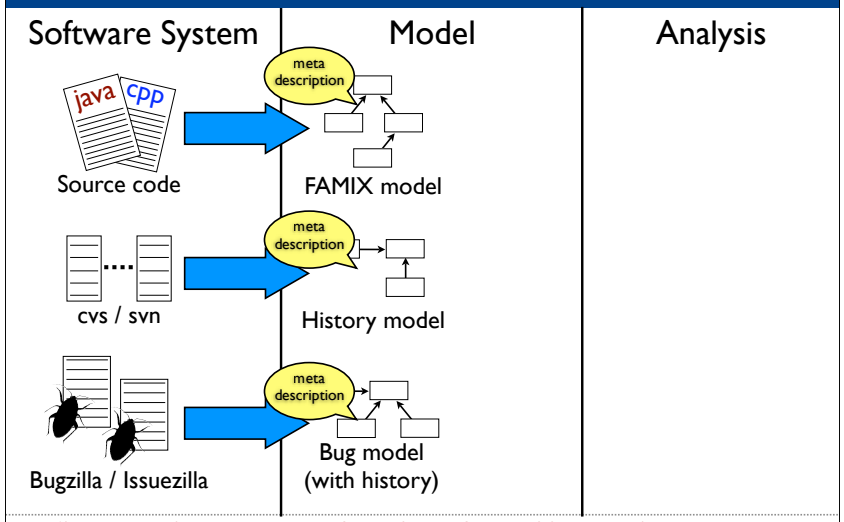
Churrasco's architecture

Software System	Model	Analysis
java cpp Source code		
cvs / svn		
Bugzilla / Issuezilla		

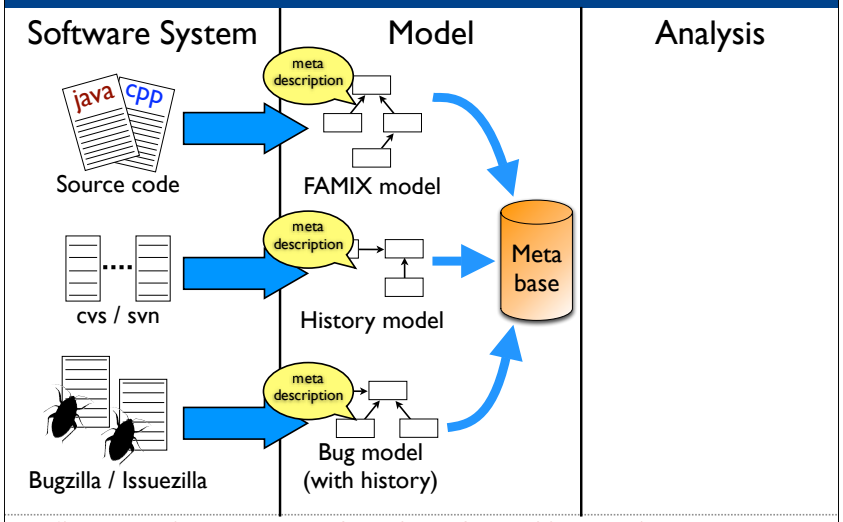
Churrasco's architecture

Software System	Model	Analysis
java cpp Source code	FAMIX model	
cvs / svn	History model	
Bugzilla / Issuezilla	Bug model (with history)	

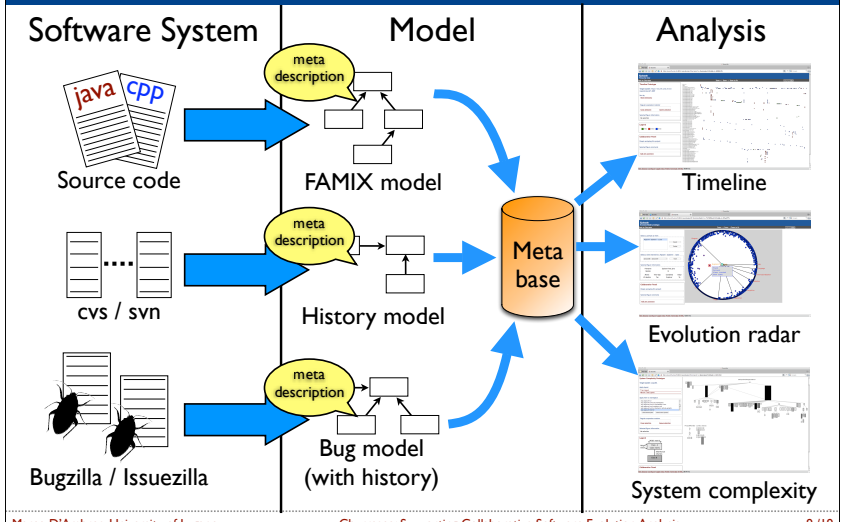
Churrasco's architecture



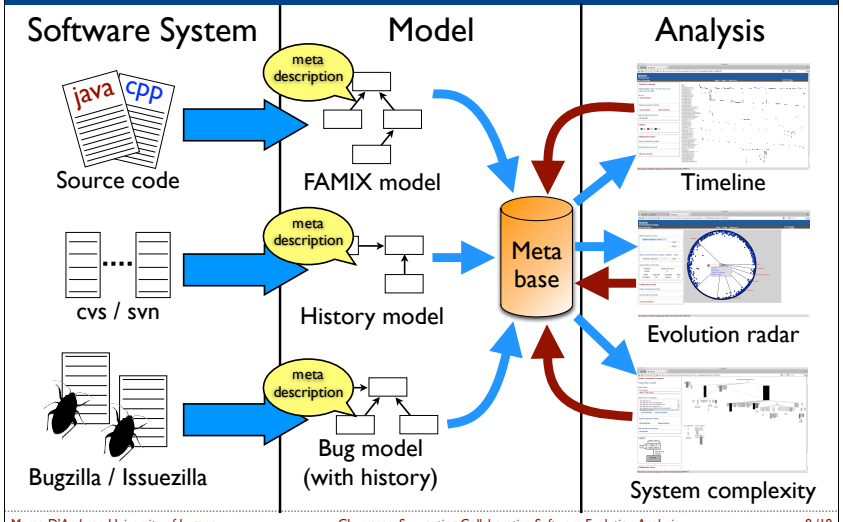
Churrasco's architecture



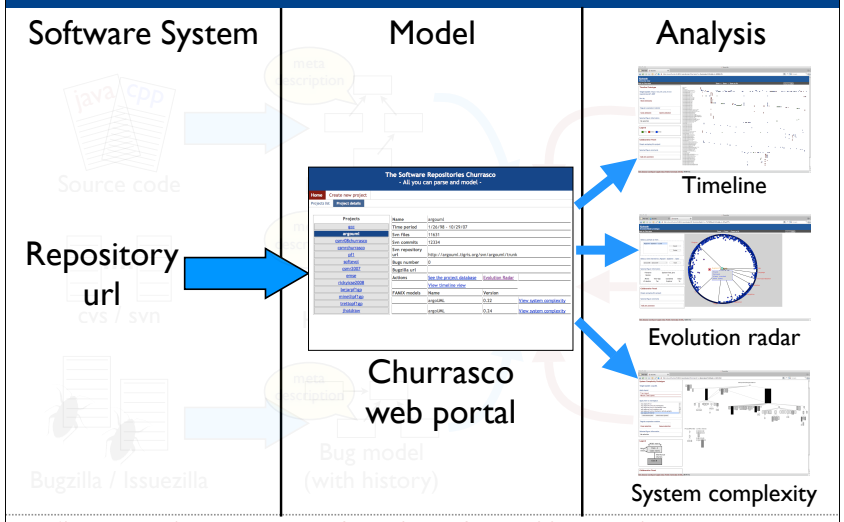
Churrasco's architecture



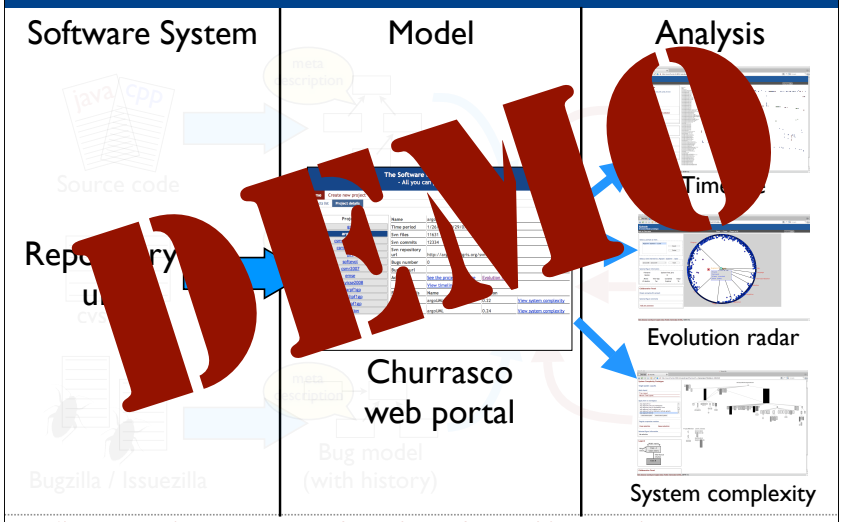
Churrasco's architecture



Churrasco's architecture



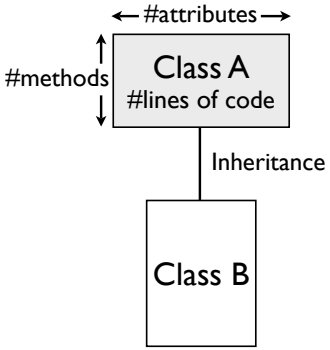
Churrasco's architecture



Based on a real story

Marco: Newcomer

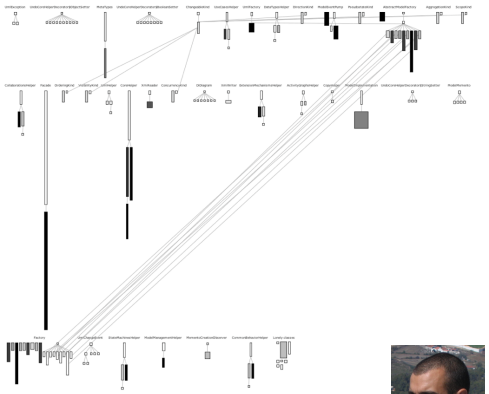
Ricky: Expert



System: ArgoUML

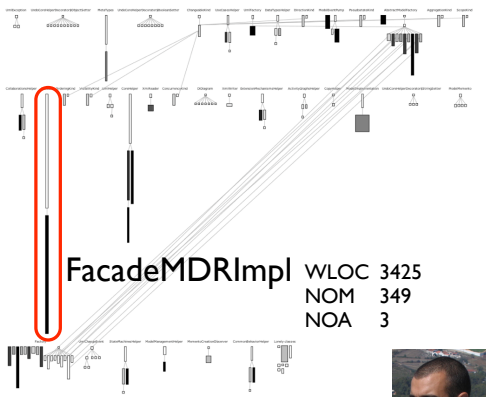
Task: Detection of bad smells in "*Model*"

Marco spots outsiders



Model package
Version 0.24

Marco spots outsiders

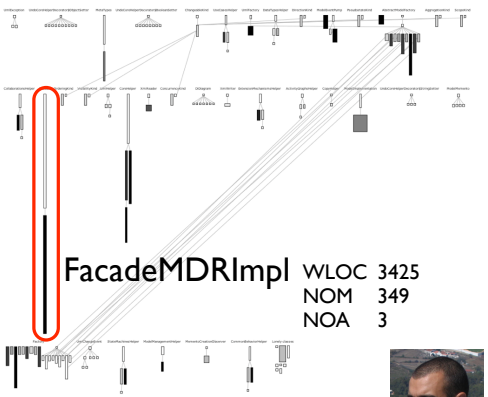


FacadeMDRImpl WLOC 3425
NOM 349
NOA 3

Model package

Version 0.24

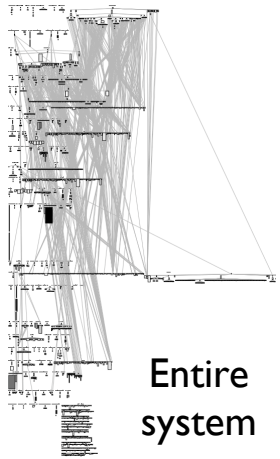
Marco spots outsiders



FacadeMDRImpl WLOC 3425
NOM 349
NOA 3

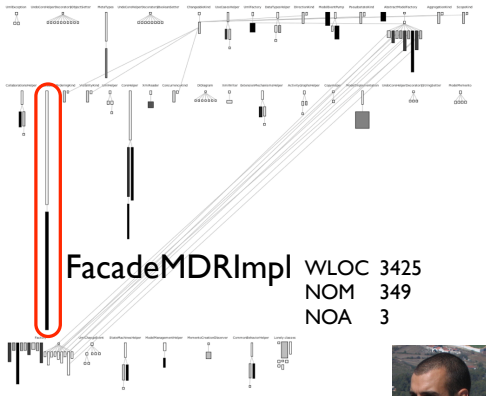
Model package

Version 0.24



Entire system

Marco spots outsiders



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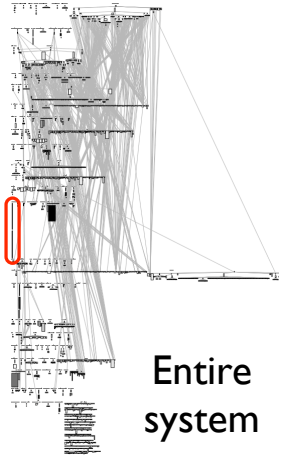
Model package

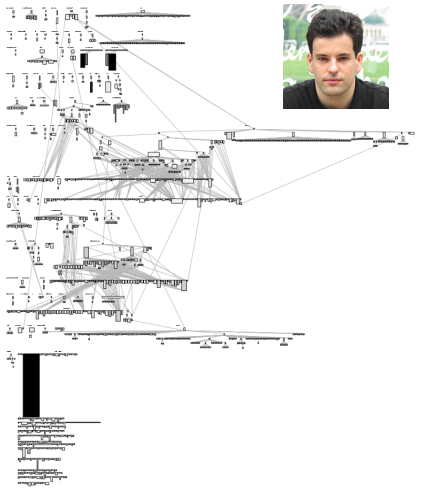
Version 0.24



Entire system

Ricky gives a history lesson

Version 0.16



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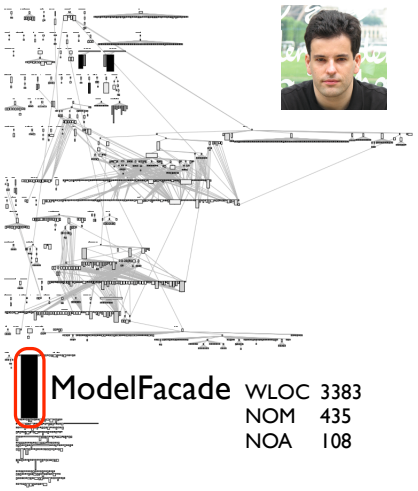
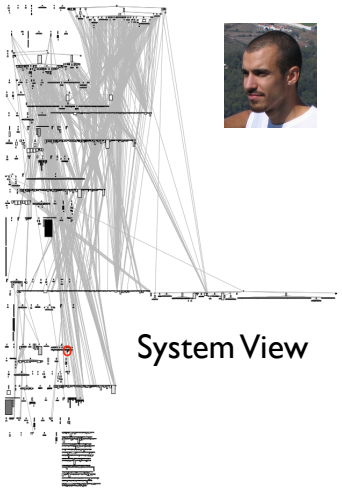
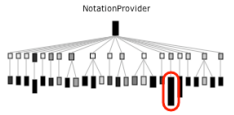
Version 0.16



ModelFacade WLOC 3383
NOM 435
NOA 108

Marco looks at Ricky's annotations

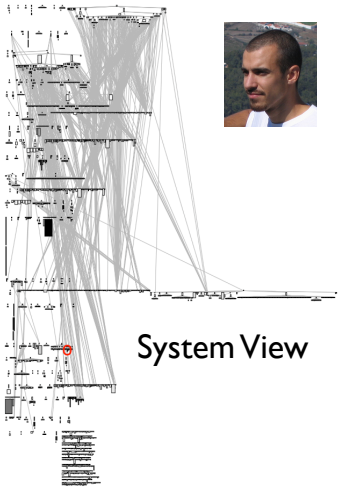


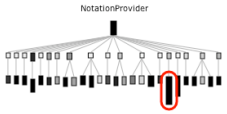


Package View

System View

Marco looks at Ricky's annotations





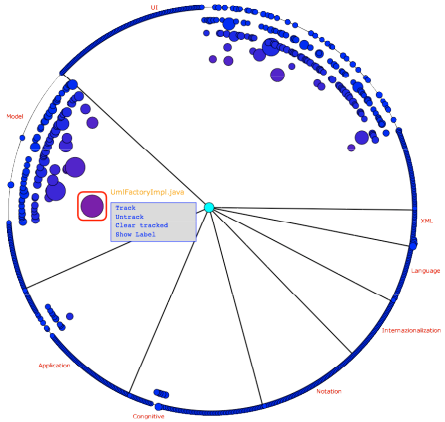
Package View

System View

Class
MessageNotationUml
Properties
WLOC1297
NOM 29
NOA 2
Ricky's comment
This is a God class with several brain methods

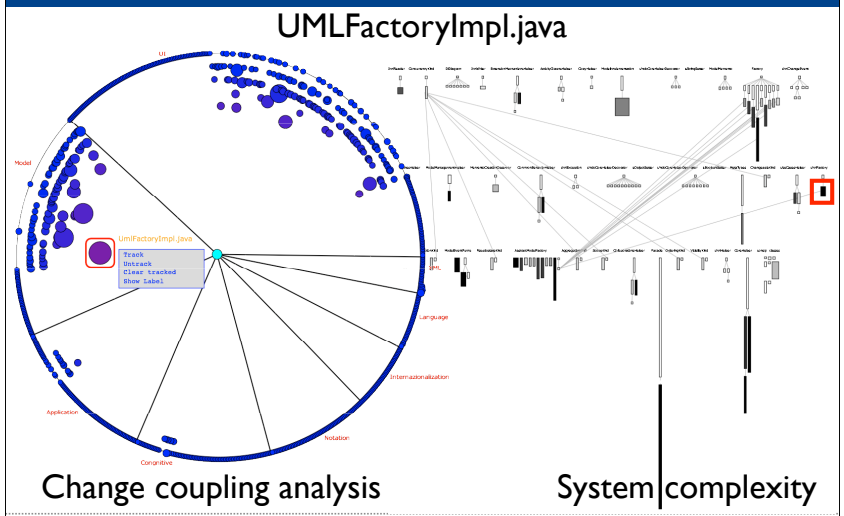
Another perspective adds insights

UMLFactoryImpl.java

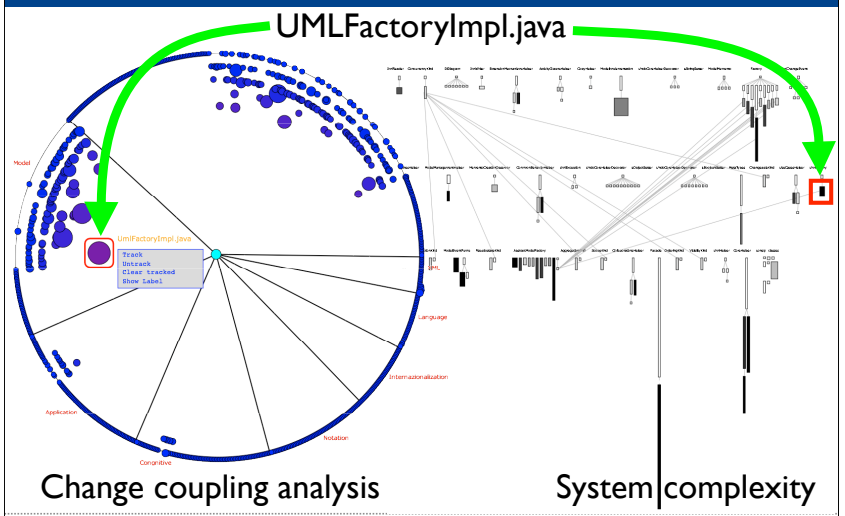


Change coupling analysis

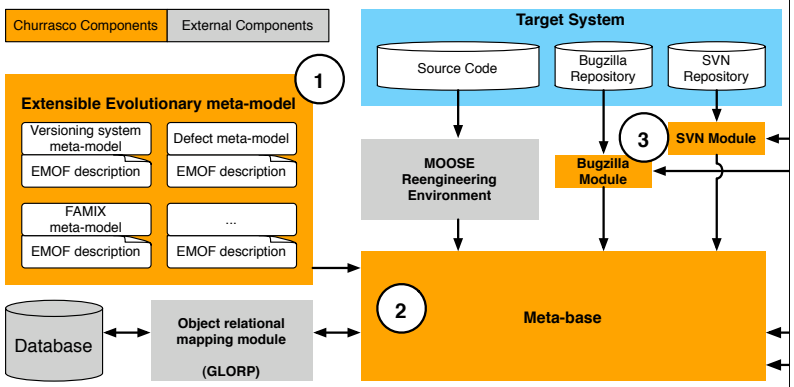
Another perspective adds insights



Another perspective adds insights



The internal architecture



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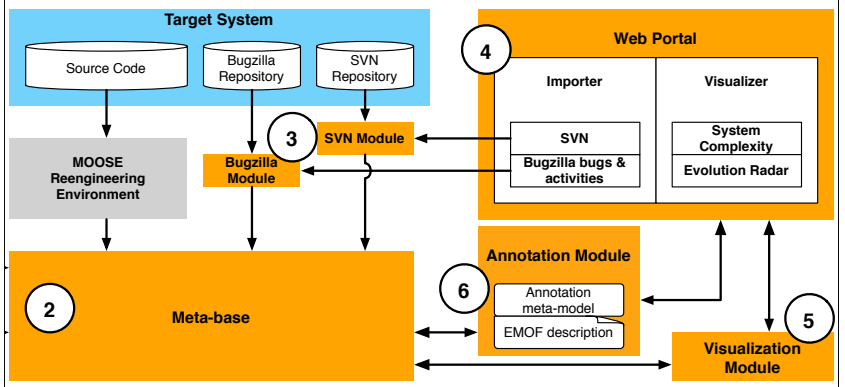
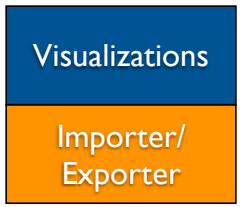
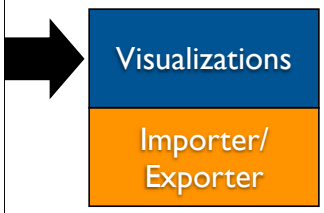


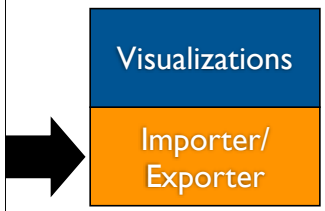
Using Churrasco as data producer



Using Churrasco as data producer



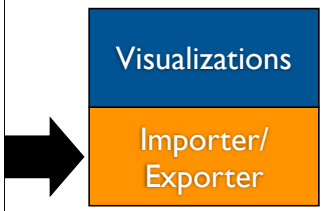
Using Churrasco as data producer



Why?

- Not to write yet another cvs importer
- Use a "web service" approach
- Writing exporters is easy, importers is hard

Using Churrasco as data producer



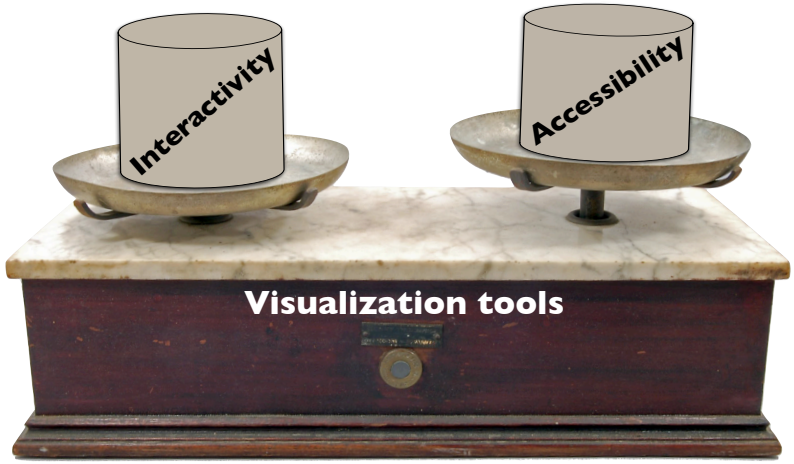
Why?

- Not to write yet another cvs importer
- Use a "web service" approach
- Writing exporters is easy, importers is hard

Already done for:

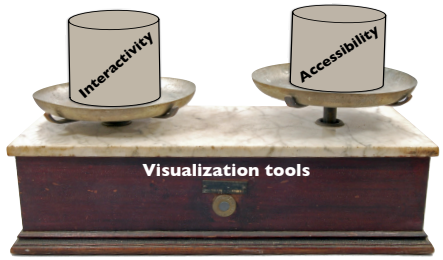
- Bug prediction
- Commits characterization

Lessons learned



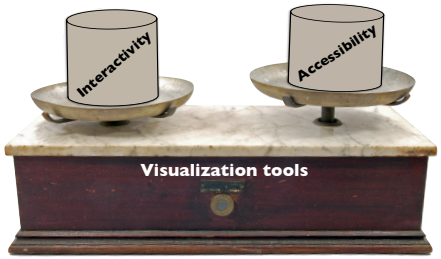
Issues to discuss

1



Issues to discuss

1

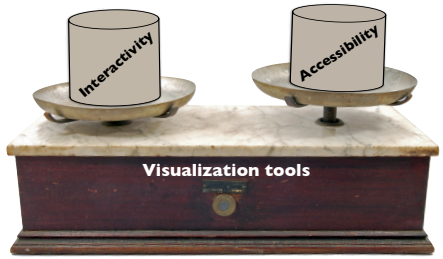


2

- Meta-model flexibility
- Tool accessibility
- Support for collaboration
- Modeling results

Issues to discuss

1



2

- Meta-model flexibility
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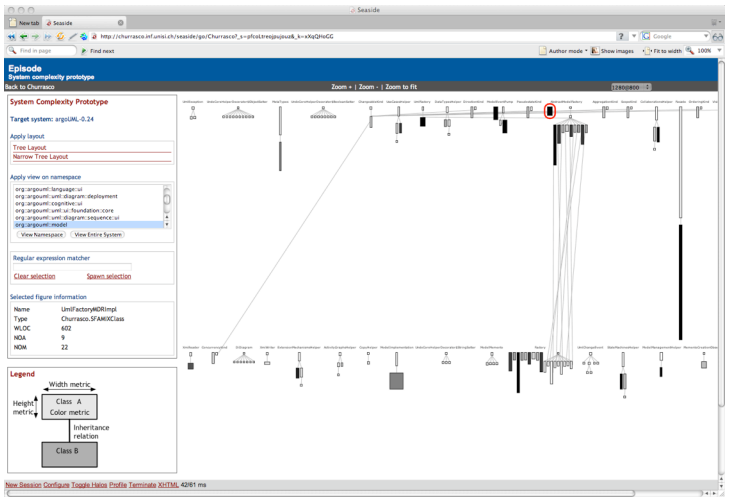
- ?

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