Universität Zürich[UZH]

Institut für Informatik

Software Quality

Lecture 6 – Human Aspects

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Announcement

Next week:

Continuous Integration

guest lecture by Beat Fluri

Overview

- Introduction to Human Aspects in Software Development
- Information Needs in Collocated Software Development Teams
- Code Bubbles
- [Coping with the Information Overload]
- Exercise Discussion

Learning Goals

- Describe why human aspects are important for achieving high software quality
- Describe information needs developers have and how they can affect the work
- Explain how Code Bubbles can support developers

- Be able to analyze and discuss a research paper

Human Aspects in Software Development

- Software is built by humans
- To ensure adequate quality in the final product, humans need to be able to understand and reason about the system

→ How can we help the human to build better software?

Research on Human Aspects

- Defect prediction based on source code metrics can be improved significantly using developer's micro interaction metrics, such as number of edits for low DOI elements
  [Lee et al.. *Micro Interaction Metrics for Defect Prediction.*]

- Ownership can correlate with defects; changes by minor contributors tend to cause more failures; changes by minor contributors should be reviewed with more scrutiny
  [Bird et al. *Don't touch my code! Examining the effects of ownership on software quality.*]

Information Needs in Collocated Software Development Teams

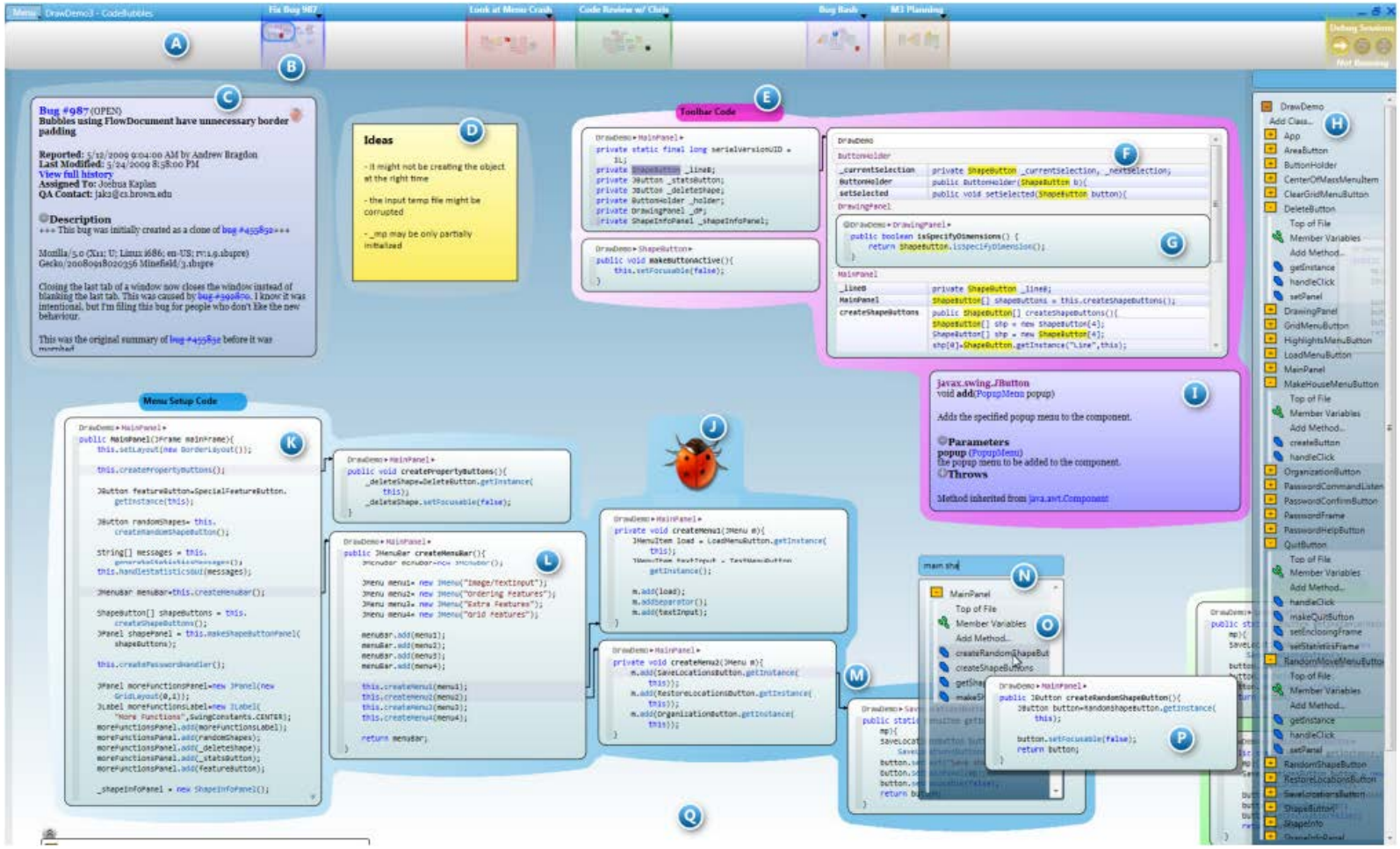
- Observed 17 software developers at large companies for 90-minute sessions
- Transcribed sessions to identify information needs and quantified them
  - Writing Code, *e.g. How do I use this data structure of function?*
  - Submitting a Change, *e.g. Did I follow my team's conventions?*
  - Triaging Bugs, *e.g. Is the problem worth fixing?*
  - Reproducing a Failure, *e.g. What does the failure look like?*
  - Understanding Execution Behavior, *e.g. What's statically related to this code?*
  - Reasoning about Design, *e.g. What is the purpose of this code?*
  - Maintaining Awareness, *e.g. What have my coworkers been doing?*

Class Activity: Questions to Discuss

- What are the major contributions/points of the paper?
- What do you like about the paper/approach?
- What do you not like about the paper/approach?
- How does the paper/approach relate to Software Quality?

+ 1 extra question per group

Code Bubbles



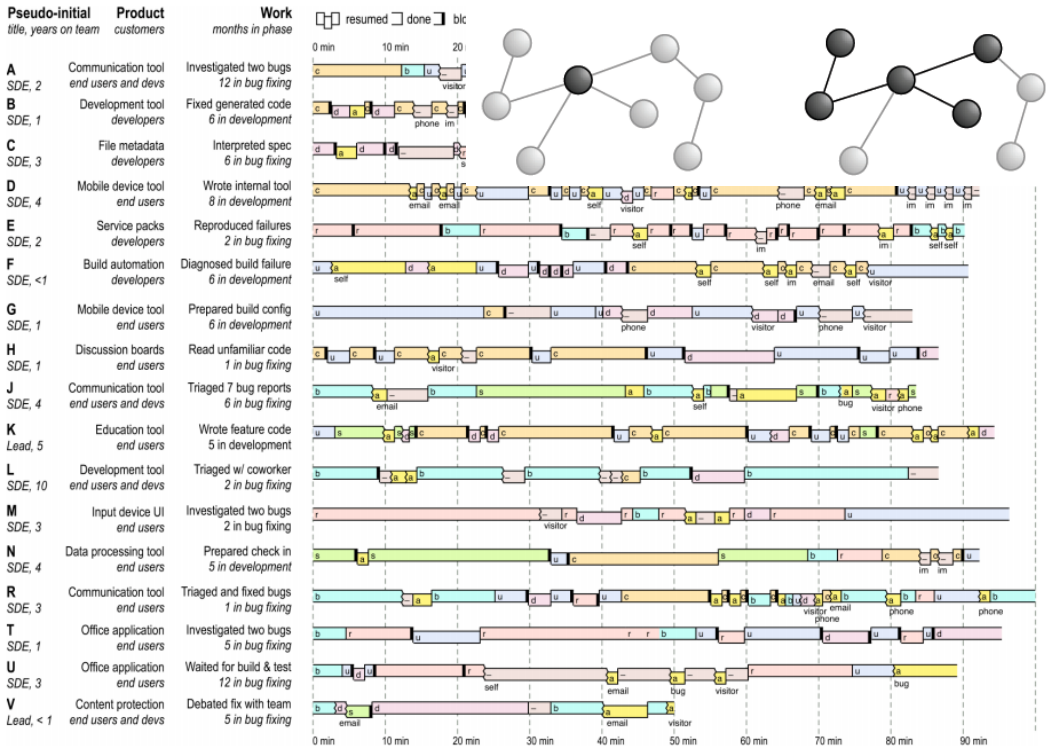
Class Activity: Questions to Discuss

- What are the major contributions/points of the paper?
- What do you like about the paper/approach?
- What do you not like about the paper/approach?
- How does the paper/approach relate to Software Quality?

To Do:

- positive points about the paper/approach on green
- Critical/negative points on red
- Questions / further discussion points on yellow

Topic – Empirical Studies on Developers' Information Needs



Information Needs (Collocated)

Finding initial focus points

5 kinds of questions.

For example: Which type represents this domain concept?

Building on those points

15 kinds of questions.

For example: Which types is this type a part of?

Understanding a subgraph

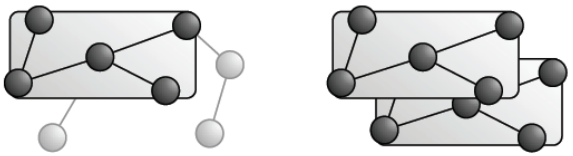
13 kinds of questions.

For example: What is the behavior these types provide together?

Questions over groups of subgraphs

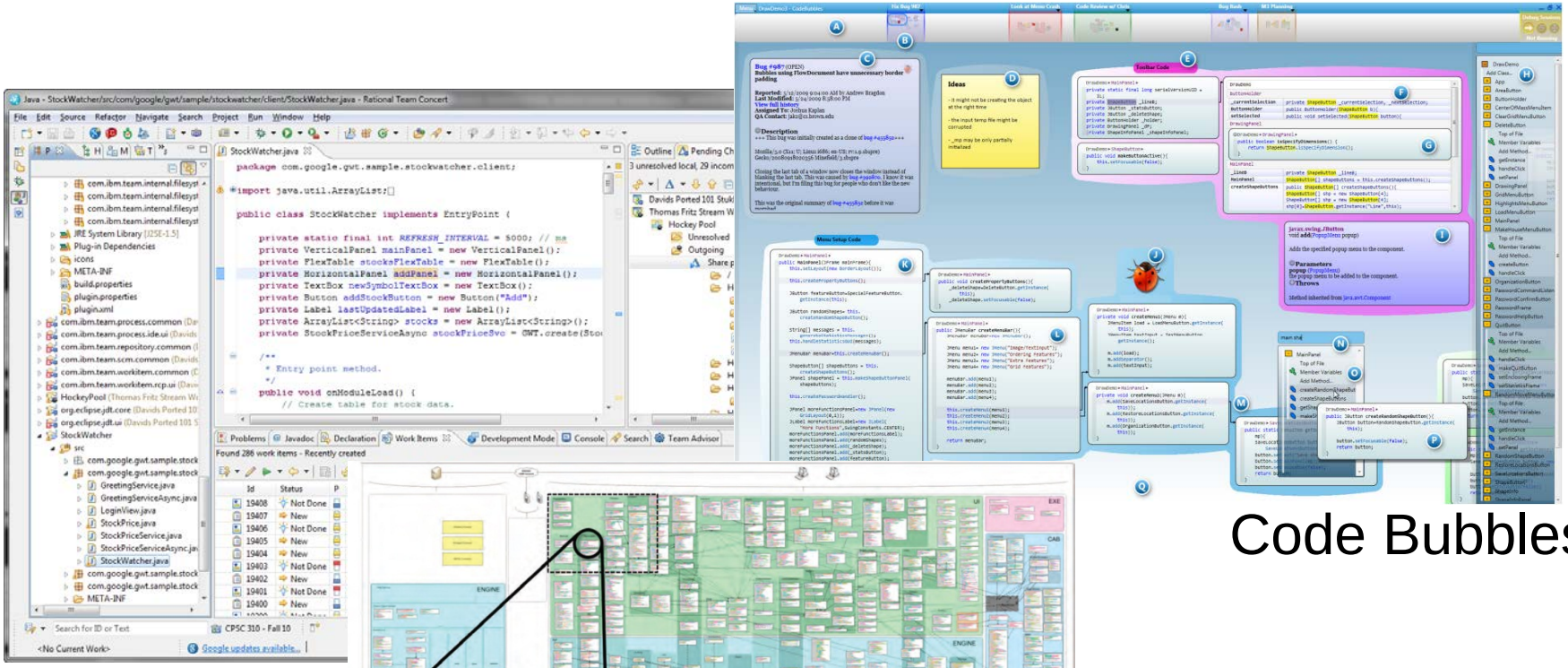
11 kinds of questions.

For example: What is the mapping between these UI types and these model types?



Code Questions

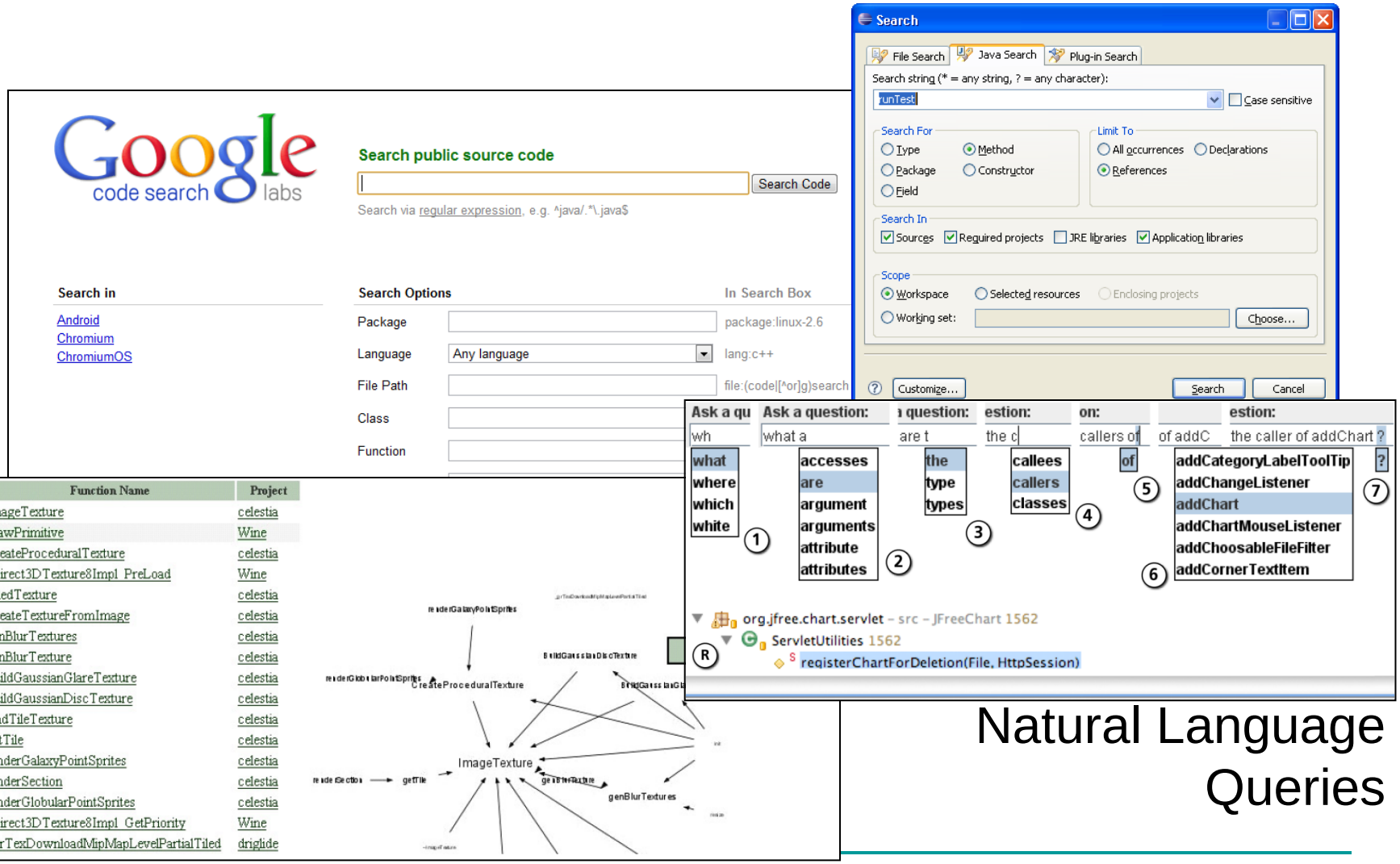
Topic – Tools and Environments for Development



Code Bubbles

Code Maps

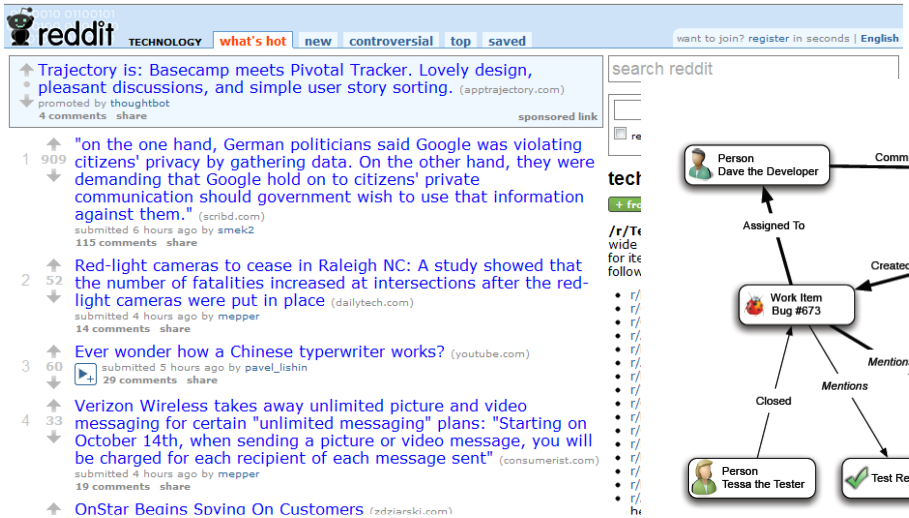
Topic – Code Search

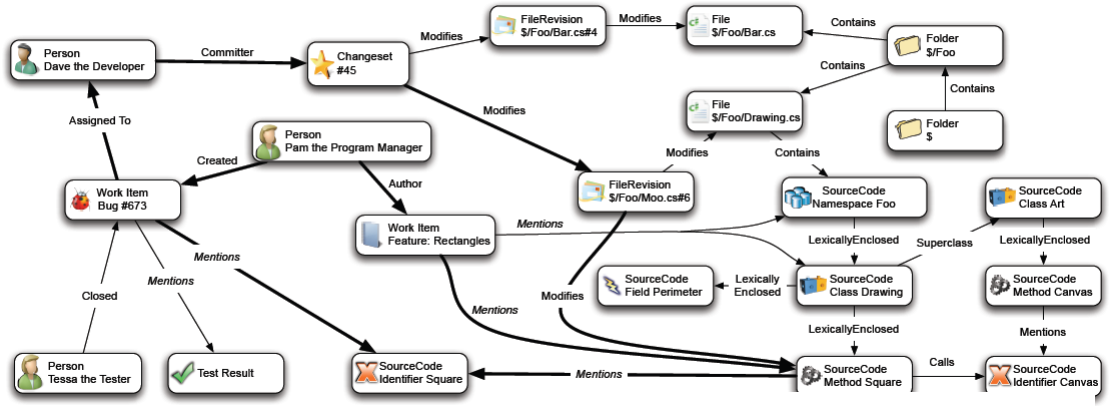


Natural Language Queries

Portfolio

Topic – Social Media and Awareness



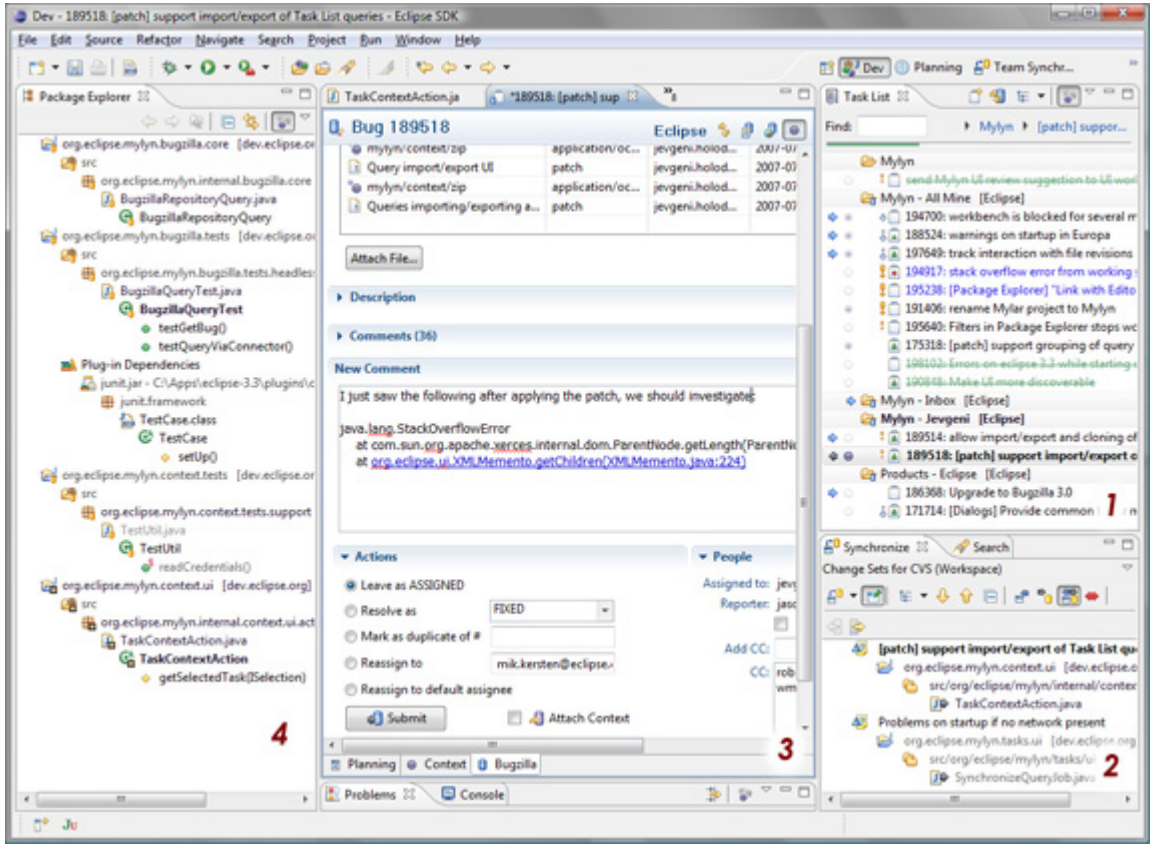


Codebook / Bridge

Severity	Date	Committer	Source File	Source Loc.	Rati
	11-Oct	tod	IProgressService	---	Implements new interface.
	27-Aug	caniszyzk	XMLErrReport	---	RESOLVED - bug 201306.
	13-Aug	mpawlonsk	IDocumentNode	getNodeAtt..()	Return Type Changed.
	4-Jun	---	---	---	New tag in SCM: R3_3_1.
	20-Mar	obesedino	Platform	getAuthInfo(...)	Required method deprecated.
	7-Mar	sbrandys	IFolder	---	Javadoc updated.
					Mylyn Feed. 128,479 changes filtered.

Customized Awareness

Topic – Improving the Software Development Process with Developer Information



Using Task Context (DOI)

Topic – Distributed Software Development

Embodied Social Proxy

Affect on Software Quality

Summary

- Human aspects play an important role for a high software quality
- Research has looked into the information needs of the developer as well as how to support developers in their daily work more concretely