

Presentation of
“On the Use of Visualization to
Support Awareness of Human
Activities in Software Development:
A Survey and a Framework”

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Problem

- Much recent work in building software engineering collaboration support visualizations
- Difficult to compare tools, find open areas for research
- No common language

Solution

- Survey existing work
- Create framework

Tools surveyed

- 12 systems/tools
 - Seesoft 1992
 - Tukan 2001
 - ADVIZOR 2002
 - Xia/Creole 2004
 - Jazz 2004
 - softChange 2004
 - Beagle 2002
 - Spectrograph 2004
 - etc.

Framework

- Five Dimensions
 - Intent
 - Purpose and motivation of the tool
 - Information
 - Data sources for the tool
 - Presentation
 - How the tool presents the data (text, graphic)
 - Interaction
 - Static v. Live, interaction techniques
 - Effectiveness
 - Feasible? Evaluated? Deployed?

Framework

Dimensions	Characteristics	Features
Intent	Role Time Cognitive Support	Team, Developer, Maintainer, Reengineer, Manager, Tester, Documenter, Researcher Present, Recent Past, Historical Authorship, Rationale, Time, Artifacts
Information	Change management Program code Defect tracking Documentation Informal communication Derived	Local History, Releases, Branching, Revisions Modules/components, Syntactic units (e.g., files), Semantic analysis Defects, Changes Requirements, Test cases, Design, Architecture Email, Instant messages Single source, multiple source
Presentation	Form Kinds of views Techniques	Text, Hypertext, Graphical Annotated views, Statistical views, Graph views, Special views Visual variables (hue, transparency, position etc), Animation, Abstractions
Interaction	Batch/Live Customization Queries View navigation	Offline, Online Level of customization, sharing and saving customizations Query language, Filter widgets Overview+detail, Zoomable views, Coupled views
Effectiveness	Status Cost Evaluation	Implemented, Availability, Scalability, Interoperability Economic cost, Installation, Learning, Usage Adopted, Case study, User study

Table 1: Summary of the framework.

Results

		See Soft	VRCIS	Tukun	Advisor	XIV/ Creek	Palantir	Jazz	Soft change	Angur	Beagle	Spectro graph	Evolution Matrix
Intent													
Role	Team size	Any	1	Any	Any	Any	Any	Small	Any	Any	Any	Any	Any
	Developer	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Manager	Yes			Yes				Yes			Yes	Yes
	Tester/Documenter	Yes								Yes			
	Maintainer/Reengineer					Yes			Yes	Yes	Yes	Yes	Yes
	Researcher	Yes			Yes	Yes			Yes	Yes	Yes	Yes	Yes
Time	Present		Yes	Yes			Yes	Yes					
	Recent past	Yes	Yes	Yes		Yes	Yes	Yes		Yes			
	Historical	Yes			Yes	Yes			Yes	Yes	Yes	Yes	Yes
Cognitive support	Authorship	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	
	Rationale							Partial	Yes	Yes			
	Time	Yes			Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
	Artifacts	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Information													
Change management	Local history							Yes					
	Releases		Yes						Yes		Yes	Yes	Yes
	Branching		Yes					Yes	Yes				
	Revisions	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Tracking	Defects/Changes	Yes			Yes			Yes	Yes				
Program Code	Syntactic units			Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Semantic analysis			Yes		Yes			Yes				
Document- ation	Requirements, tests												
	Design, Architecture												
Informal comms.	Email												
	Instant messages							Yes					
Derived	Single source				Yes		Some			Yes		Yes	
	Multiple source			Yes				Yes	Yes		Yes		Yes

Contributions

- Proposed research agenda
 - Intent
 - Need for requirements
 - Little work to determine what should be in a tool
 - Information
 - Fact extraction is key
 - Stop reinventing the wheel
 - Presentation
 - Combine Views
 - Integration and combination for effectiveness

Contributions

- Proposed research agenda (cont'd)
 - Interaction
 - Need for improved queries
 - Interactive visual queries, possible formal query language
 - Effectiveness
 - Need for more evaluation and benchmarks
 - Mostly limited to case studies, need much more evaluation work to determine effectiveness

Positive

- Helps compare existing tools
- Provides common language
- Shows holes in existing
 - Research
 - Tools
- Sets a research agenda

Negative

- Doesn't find deficiency in dimensions not covered by survey
- Validation not included/possible
 - Community support
- Needs update every few years