Outlining the state-of-the-art of requirements engineering tools

Seminar project

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Problem

How the Customer explained it

How the Project Leader understood it

How the Analyst designed it

What the Customer really needed
Solution?

Get it done with a tool!
Todays requirements for RE tools

Essential:
- Collaboration
- Communication
- Flexibility
Questions

How are existing academic tools fitting to be used?

• Mobile?
• Collaborative?
• Online?
Methods
Literature Review

- Two search iterations
- From 2005
- English abstract
- Requirement engineering tool
Literature Review

2000+ Search results
140 papers
121 tools

Until now: 38 tools evaluated
Evaluation Parameters

Tool name & year of first publication

RE technique & RE phase

Tool type

Accessability & installation

Evaluation & improvements

Research group

Main & online features

Technologies used

Intended users & collaboration

Capabilities
Findings
Tool publication years
# Most popular technologies used

<table>
<thead>
<tr>
<th>Technology</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java</td>
<td>14</td>
<td>37%</td>
</tr>
<tr>
<td>Eclipse</td>
<td>7</td>
<td>18%</td>
</tr>
<tr>
<td>HTML</td>
<td>5</td>
<td>13%</td>
</tr>
<tr>
<td>SQL</td>
<td>4</td>
<td>11%</td>
</tr>
<tr>
<td>PHP</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>XML</td>
<td>6</td>
<td>16%</td>
</tr>
<tr>
<td>No Value</td>
<td>9</td>
<td>24%</td>
</tr>
</tbody>
</table>
Tool type, access and installation

• 14 Prototype tools
• No vision tools
• No mobile tools

• Access to 8 out of 38 tools
  • four broken links
  • one link with restricted access

• Six tools installed & used successfully
  • One with an online function
### Intended audience

<table>
<thead>
<tr>
<th>Audience</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirement engineers</td>
<td>31</td>
<td>82%</td>
</tr>
<tr>
<td>Project stakeholders</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Requirement engineers &amp; project stakeholders</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>End-users</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>All above</td>
<td>3</td>
<td>8%</td>
</tr>
</tbody>
</table>

#### Collaboration possible?

- **Yes**: 15%
- **No**: 85%
Tool evaluations

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>yes</th>
<th>no</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>28</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>74%</td>
<td>26%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tested on real project</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Improvements identified</th>
<th>58%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow-up improvements published</td>
<td>13%</td>
</tr>
</tbody>
</table>

![Bar chart showing tool evaluations results]
Capabilities

- Reduce cost/effort
- Refine existing requirements
- Generate new requirements
Challenges faced

• RE Phases don’t always have clear boundaries
• Messy paper structure and broken English
• Tool dependencies
Limitations of the study

• Me, myself and I

• Scope limited to studies found in literature review

• Search procedure could possibly not capture follow-up papers
Early conclusions

• Academic RE tools are not yet ready for agility & collaboration

• A lot of tools lack proper evaluation

• RE cannot be fully automated at this point
Future work

• Finish tool evaluation

• Contact authors of inaccessible tools

• Make it a paper!
Summary

Literature Review

2000+ Search results
140 papers
121 tools

Intended audience & collaboration

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</table>
| Requirement engineers                        | 31  | 82%
| project stakeholders                         | 2   | 5%
| Requirement engineers & project stakeholders | 2   | 5%
| End-users                                     | 0   | 0%
| All above                                     | 3   | 8%

Early conclusions

• Academic RE tools are not yet ready for agility & collaboration
• A lot of tools lack proper evaluation
• RE cannot be fully automated at this point

Future work

• Finish tool evaluation
• Contact authors of inaccessible tools
• Make it a paper!