Developers have to make decisions and solve issues
Rationale covers justifications behind these decisions
Decision knowledge is knowledge about issues that lead to decisions, alternatives, and arguments
Decision knowledge is hard to capture
Representation in form of rationale models

Definition
Another word for rationale is decision knowledge. We use both words interchangeably.
Why Should we Capture Rationale?

- Improves decision-making
- Prevents knowledge vaporization
- Makes issues and decisions more transparent to stakeholders
- Helps to deal with change
# How to Model Rationale?

<table>
<thead>
<tr>
<th>Emoji</th>
<th>Name</th>
<th>Indicating Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>🚨</td>
<td>Issue</td>
<td>I have a question ...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How should . . . , any suggestions?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>We need to discuss how . . .</td>
</tr>
<tr>
<td>🏛️</td>
<td>Alternative</td>
<td>I { suggest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>One { option</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What { about</td>
</tr>
<tr>
<td>🎉</td>
<td>Pro</td>
<td>The { advantages</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I { like</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I agree with user . . .</td>
</tr>
<tr>
<td>🚫</td>
<td>Con</td>
<td>The { disadvantages</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I don’t like it because . . .</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I disagree with user . . .</td>
</tr>
<tr>
<td>❌</td>
<td>Decision</td>
<td>Let’s do . . .</td>
</tr>
<tr>
<td></td>
<td></td>
<td>We decided . . .</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The best option is . . .</td>
</tr>
</tbody>
</table>
Continuous Rationale Management (ConRat)

- **Goal:** Integrate rationale management into continuous software engineering (CSE)
- Developers capture rationale in various documentation locations
- Enable explicit capture supported through
  - Supervised text classification
  - Summarization of changes
- Support exploitation through visualization of knowledge (also for change impact analysis)
- Capturing and exploitation support included in CSE practices (triggers)
  - Committing code
  - Changing status of JIRA issues
  - Writing meeting protocols
Lecture on Rationale Management

- Why? Address rationale capture problem by teaching rationale management
  ⇒ Lecture on rationale management to motivate students
  - Duration: 90 minutes
  - Covers theoretical part and six exercises
  - First instantiation November 8, 2018 @iPraktikum @TUM
Lecture on Rationale Management: Prerequisites

- Students grouped into teams, web-connected devices
- JIRA, Confluence, Slack (Polly App)
- JIRA ConDec plug-in (available via Atlassian Marketplace)
- For every team: JIRA and Confluence project
Capturing Rationale in JIRA

Activity

All  Decision Knowledge  Comments  Work Log  History  Activity

Jan Ole added a comment

How to fetch and display usernames?

Anja added a comment

We should apply the observer pattern!

Jan Ole added a comment

When using the plain old observer pattern, the whole list must be downloaded in order to display even one record, the view is blocked by network operation.

We definitely should apply reactive programming when fetching and displaying usernames!

When using reactive programming, the method is executed concurrently, the view is not blocked and the username is displayed as soon as it is fetched.
Find the scenario documented in the project. How many issues are linked to the scenario?
Linking Elements

Link the existing issue “How to save transactions?” to the scenario.
Filtering

Filter the element types so that only the scenario and decisions are shown in the rationale tree.
Students’ Exercises

Discuss in Team

Create a new issue “How to persist data?”. Add the following alternatives: “JSON!” , “SQLite!”. Discuss and capture pro and cons of each persistence alternative in your team. Add more alternatives and make a decision.

- How to enable the user to describe expense?
- How to indicate the current financial situation of the user with a fancy picture?
- How to persist data?
  - JSON
    - JASON is a wonderful name
    - JASON is smug
  - NoSQL
  - Paper
    - Trees have to die
    - Trees have to die
  - SQLite
    - I prefer Cola Lite
    - No one likes Cola light
    - I really don’t like it
- How to save transactions?

• Every student contributed a mean value of 1.4 rationale elements
Students’ Exercises

Import Rationale into Meeting Agenda

Open your Confluence space and create a new page called <Rationale Lecture> (one per team). Create a sub-page called <Your Name> (every team member). Use the JIRA Issue/Filter macro to display decisions from your JIRA project. Answer the question: How many decisions do you see?

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Rationale Management [5 min]

<table>
<thead>
<tr>
<th>T</th>
<th>Summary</th>
<th>Created</th>
<th>Reporter</th>
</tr>
</thead>
<tbody>
<tr>
<td>🎨</td>
<td>Apply Grand Central Dispatch</td>
<td>Nov 07, 2018</td>
<td>Anja Kleebaum</td>
</tr>
<tr>
<td>🎨</td>
<td>Apply reactive programming!</td>
<td>Nov 07, 2018</td>
<td>Anja Kleebaum</td>
</tr>
</tbody>
</table>

2 issues 🔄 Refresh
Many elements make it hard to get overview

- Rationale elements should not always be a single ticket (ticket-overflow)
Conclusion and Upcoming Work

- Students comprehend the usage of rationale model
- Rationale management during the agile project course
- Role of rationale manager
- Collection of feedback using a questionnaire
Selected References


