Supporting and Exploiting Requirement Decisions

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Why is Sharing Requirement Decisions Important?

“Decisions are like material floating in a pond. When not touched for a while, they sink and disappear from sight. These sunken decisions are the most difficult to change at a later stage.” --- Roeller et al., 2006

“Architecturally significant requirements are in fact architectural design decisions, and vice versa.” --- de Boer & van Vliet, 2009

Not sharing decisions similarly harmful as not sharing requirements
Decisions in commit messages are hard to access and share.
What is Decision Knowledge?

• Decision knowledge is knowledge about
  • **Issues**: decision problems to be solved
  • **Decisions**: resolution of an issue
  • **Alternatives**: options/possible solutions for an issue
  • **Arguments**: support or attack alternatives/decisions

• **Managing** decision knowledge has **many benefits**
Decision Knowledge Management Problems

1. Intrusiveness of
   - Documentation techniques => Capture problem
   - Exploitation/Sharing because decision knowledge documented
     - in various locations => hard to access
     - not systematic

2. Bad documentation quality
   - Inconsistency/Outdated documentation because of change
   - Incompleteness
Continuous Decision Knowledge Management (ConDec) Scenario

- Requirements engineer documents requirements in Jira…

... and captures decision knowledge in the description and comments of the requirement.
ConDec Scenario: Creation of Tasks

- As a user, I want to choose a password.
- The users might choose a very simple password, such as their dog’s name.
- The users are assisted in choosing strong passwords.
- A library to check password complexity is used.
- The system should check the security of the password.
- The password should not be cracked by brute-force attacks, such as their dog’s name.
- The requirements engineer creates development tasks for the user story.
ConDec Scenario: Capturing Decision Problem

The developer adds a decision problem to the comment of the task.
The knowledge graph integrates requirements, decision knowledge, code, …

development tasks, …

open decision problems, …
ConDec Scenario: Committing the Decision

anja@se-hd ~/home/anja/fgre (FGRE-2.pw.storage)

git commit -a

Encrypt the password with the SHA1 algorithm

# Please enter the commit message for your changes. Lines starting with '#' will be ignored, and an empty message aborts the commit.

# On branch FGRE-2.pw.storage

# Changes to be committed:

    new file: src/main/PasswordPersistenceManager.java
The decision problem is now solved.

The decision was automatically linked to the decision problem!
Continuous Decision Knowledge Management (ConDec)

- Techniques and tools that integrate in continuous software engineering (CSE)
- Enables *explicit, systematic capture*
- Capture supported through
  - Supervised text classification
  - Summarization of changes

The ConDec plugins are open source! 🎉
github.com/cures-hub
Continuous Decision Knowledge Management (ConDec)

- Support *exploitation* through visualization of integrated knowledge

The ConDec Jira plugin is available via the Atlassian Marketplace! 🎉
Detection of Unsolved Decision Problems in Dashboard

open decision problems
Current and Future Work

• Evaluation
  • In agile student projects @TUM and @UHD
  • On development data of ConDec and Lucene open-source projects
• Goals:
  • Show acceptance of tool support according to Technology Acceptance Model (TAM)
  • Assess quality of the established knowledge graph in terms of consistency and completeness
• Improvement of ConDec tools
• Development of teaching techniques
Thanks! Which questions do you have?

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