University of Zurich[UZH]

RERG

Requirements Engineering II

Assignment 5

Goal-Oriented Requirements Engineering and Quality Requirements

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I. Task

Individual Tasks

- Read the mandatory items in the reading list
- Prepare two questions about each paper to ask your classmates. These questions can, for example, be about aspects of the paper that are not clear to you, or about your classmates' opinion on interesting aspects.
- Be prepared to give a short summary of each paper in class. This summary should address the following questions:
  - What is the main message of the paper?
  - What are the expected benefits of the proposed method or the paper in general?
  - What are weaknesses of the paper in your opinion?
- Be prepared to answer the questions given in Sect. III below in class.

Group Tasks

- Prepare a 10-12 minutes presentation (plus 6-8 minutes of discussion) on the theme assigned to your course group (cf. Sect. IV) and choose two persons from your group to present it.
  - At the beginning of your presentation, relate your topic to the session's topic (as represented by the mandatory reading).
  - Browse/read additional papers and/or web pages where necessary.
  - Send your presentation to Norbert after the session to share it with others.
- Build an *i** strategic rationale model for the case study presented in RE I. Send in your solution as a PDF to Norbert before the assignment discussion.

II. Reading List

Mandatory reading

[van Lamsweerde 2009] provides an overview of goal-oriented requirements engineering. [Dardenne 1993] describes KAOS and [Yu 1997] *i**. These approaches utilize goals for requirements engineering purposes, particularly for an early phase of RE where stakeholders and their intentions are identified.

Theme-specific reading

[Darimont 1996], [van Lamsweerde 1998]: Goal refinement and conflict resolution with KAOS.
[Horkoff 2016], [Yu 2013], [Tawhid 2012]: Analyzing and applying *i** goal models
[Chung 2000], [Glinz 2008]: Soft Goals and Quality Requirements.

III. Questions

- What is goal-oriented requirements engineering?
- What is the added value of goals in the requirements engineering process?

- What is the difference between goals and requirements?
- What are the basic concepts of KAOS?
- What are the basic concepts of *i**?
- How can we analyze a goal model?

IV. Themes for Presentation

A. KAOS

Present the main ideas, using an example. Elaborate on how complexity of goal-oriented reasoning can be hidden and how conflicts between goals can be detected and resolved.

B. Analyzing and applying *i** goal models

Describe how i* goal models can be analyzed and what the benefits of such analyses are. How can i* models be used in practice?

C. Softgoals and Quality Requirements

How are goals analyzed that cannot be proven to be satisfied? How do these soft goals related to quality requirements? How should they be specified in practice?

References

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A. Dardenne, A. van Lamsweerde, S. Fickas (1993). Goal-Directed Requirements Acquisition. *Science of Computer Programming* 20. 3-50.

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J. Horkoff, E. Yu (2016). Interactive Goal Model Analysis for Early Requirements Engineering. *Requirements Engineering* 21(1): 29-61.

A. van Lamsweerde (2009). Goal Orientation in Requirements Engineering. In A. van Lamsweerde: *Requirements Engineering: From System Goals to UML Models to Software Specifications*. Wiley. 259-283.

A. van Lamsweerde, R. Darimont, E. Letier (1998). Managing Conflicts in Goal-Driven Requirements Engineering. *IEEE Transactions on Software Engineering* 24(11):908-926.

R. Tawhid, E. Braun, N. Cartwright, M. Alhaj, G. Mussbacher, A. Shamsaei, D. Amyot, S.A. Behnam, and G. Richards (2012). Towards Outcome-Based Regulatory Compliance in Aviation Security", *20th IEEE International Requirements Engineering Conference (RE'12)*, Chicago, USA. 267-272.

E. Yu (1997). Towards Modelling and Reasoning Support for Early-Phase Requirements Engineering. *3rd IEEE International Symposium on Requirements Engineering (RE'97)*, Annapolis MD, USA. 226-235.

E. Yu, D. Amyot, G. Mussbacher, X. Franch, and J. Castro (2013). Practical Applications of i* in Industry: The State of the Art. *21st IEEE International Requirements Engineering Conference (RE'13)*, Rio de Janeiro, Brazil. 366-367.