Requirements Engineering II

Martin Glinz, Professor, Dr. rer. nat.

Assignment 6: The Requirements Modeling Language ADORA

1. Tasks

- Read the mandatory items in the reading list
- Be prepared to answer the questions given below in class
- Specify the problem given in the case study below in ADORA. The focus of the model shall be on the handheld device. Where necessary, ask the tourist guide expert (see below) or make (and document) assumptions. For creating the models, you have the choice between using the ADORA tool (see below), any general-purpose drawing tool or paper-and-pencil.

  Hints:
  - Start with a type scenario that specifies how a tourist interacts with the tourist guide system.
  - Then model the components that are needed to provide the functionality of the tourist guide system.
  - Model the data and the behavior of the components with objects and states.
  - Model crosscutting functionality as aspects.

  When you need more information about modeling with ADORA or about the tourist guide, you may contact Silvio Meier (http://www.ifi.unizh.ch/~smeier, <smeier@.ifi.unizh.ch>). He plays two roles: (a) ADORA modeling consultant and (b) tourist guide system expert.

2. Reading list

Mandatory reading

[Glinz, Berner, and Joos 2002] and [Glinz 2006] provide an overview of ADORA. [Meier et al. 2006] describe the aspect-oriented extension of ADORA. [Glinz, Seybold, and Meier 2007] summarize the simulation capabilities of the ADORA tool and sketch a scenario-driven modeling process.

Optional reading

[Reinhard et al. 2006], [Seybold, Meier, and Glinz 2005]

3. Questions

- What are the basic principles that ADORA is built upon?
- What are the main differences between ADORA and UML?
- How can incompleteness be modeled explicitly in ADORA?
- What is a crosscutting concern and what does this mean for requirements?
- How can crosscutting concerns be modeled as aspects in Aspect-ADORA?

4. Themes for presentation

There are no presentations to be prepared and given in this assignment. Instead, we will conduct a modeling experiment in class.

5. Case Study

Assume you are working for a company who wants to develop and market a location- and context-sensitive tourist guide system [Davies et al. 2001]. The following requirements have been elicited so far:

The tourist guide consists of an electronic hand-held device that offers the following facilities to the visitors. The rough requirements are as follows:

For the initialization of the tourist guide a set of preferences and interests is entered by the tourist to generate and propose interesting suggestions for tours of the city and cultural events to visit;

Having initialized the device, the user can choose from the following functions of the tourist guide.

a. City Information: Retrieve information about the city, including information about the current location. The retrieved information depends on the preferences, interests and position of the user.

b. Surprise: The device suggests randomly an activity for the tourist. The activity is chosen according to a, c, d, e.

c. City Tours: Provide route guidance to help visitors move between locations on the tour. The route is chosen according to the position of the preferences, the interests and the position of the user.

d. Walking Route: The device suggests a walking route. The route is determined according to the preferences, interests and the position of the system.

e. Cultural Event: The device suggests a cultural event or museum to visit. The suggestion is chosen according to the preferences, interests and position of the user.

Access Services: Access external services, such as hotel and theatre and ticket reservations.

The handheld device locates its position by using a GPS receiver. The position needs to be updated every 20 seconds.

6. The ADORA tool prototype

The ADORA tool prototype can be freely downloaded (see Web resources below). The tool requires Eclipse and Java 2 (JDK 1.5). Please note that the simulation features described in [Glinz, Seybold, and Meier 2007] are implemented only in a previous version of the tool, which was a standalone Java application.

References

Davies, N. K. Cheverst, K. Mitchell, and A. Efrat (2001). Using and Determining Location in a Context-Sensitive Tour Guide. *IEEE Computer* **34**, 8. 35-41.

Glinz, M., S. Berner, S. Joos (2002). Object-oriented modeling with ADORA. *Information Systems* **27**, 6. 425-444.

Glinz, M. (2006). *Hierarchical Object Modeling with ADORA*. Presentation slides, University of Zurich.

Glinz, M., C. Seybold, S. Meier (2007). Simulation-Driven Creation, Validation and Evolution of Behavioral Requirements Models. *Dagstuhl-Workshop Model-Based Development of Embedded Systems (MBEES 2007)*, Dagstuhl, Germany, January 2007.

Meier, S., T. Reinhard, C. Seybold, M. Glinz (2006). Aspect-Oriented Modeling with Integrated Object Models. *Modellierung 2006. Innsbruck, Austria. GI-Edition - Lecture Notes in Informatics, Vol. P-82*. 129-144.

Reinhard, T., C. Seybold, S. Meier, M. Glinz, N. Merlo-Schett (2006). Human-Friendly Line Routing for Hierarchical Diagrams. *Proceedings of the 21st IEEE International Conference on Automated Software Engineering (ASE'06)*, Tokyo, Japan. 273-276.

Seybold, C., S. Meier, M. Glinz (2005). Simulation-based Validation and Defect Localization for Evolving, Semi-Formal Requirements Models. *Proceedings of the 12th Asia-Pacific Software Engineering Conference (APSEC 2005)*, Taipei, Taiwan. 408-417.

Web resources

The *ADORA tool* and an *installation guide* for the tool can be downloaded at

http://stage.ifi.unizh.ch/rerg/research/projects/adora/tool/download/

http://www.ifi.unizh.ch/req/adora/adora-help/about/software_updates.html

Further help about the ADORA tool can be found at
    http://www.ifi.unizh.ch/req/adora/adora-help/
Please note that this is a work-in-progress document.

First steps in the ADORA tool can be found at:

http://www.ifi.unizh.ch/req/adora/adora-help/gettingstarted/ how_to_startup_adora_editor.html