I. Tasks

- Read the mandatory items in the reading list
- Be prepared to answer the questions given below in class
- Prepare a 15 minutes presentation (5-10 slides) on the theme assigned to your course group. Browse/read additional papers and/or web pages where necessary.
- Consider the following product line of point of sale (POS) system.

Every POS system can authenticate a registered cashier, identify sales items with a barcode reader, print receipts, and supports at least one method for payment. There are several options for payment methods, which include payment in cash, payment by debit card and payment by credit cards. Furthermore, there are three ways of identifying sales items: scanning the price tag, entering the article code over a keyboard, and calculating the price by weighing the item and entering the item’s type using the keyboard. All payment methods and all price identifications can be supported by one POS system, but at least one always has to be. Whenever a debit card or a credit card is selected, also an additional card issuer online connection module needs to be selected.

Use a feature diagram as described in Fig. 3 of [Jarzabek 2003] to specify the variability of the POS system.

II. Reading List

Mandatory reading
Chapter 2 of [Pohl 2005] provides a framework for software product line engineering. [Clements 1999] introduces software product lines with an example while [Clements 2003] highlights the differences between product line scope and product line requirements.

Theme-specific reading
[Reiser 2006], [Schobbens 2007]: Feature-oriented Domain Analysis
[Jarzabek 2003], [Stoiber 2010b]: Specifying Product Line Variability in Requirements Models
[Czarnecki 2005], [Stoiber 2010a]: Product Derivation with Requirements Models

III. Questions

- What is a software product line? What is domain engineering and what is application engineering?
- How do we call requirements that are mandatory for all products of a software product line? How are they handled?
- How are requirements handled that differ between the products of a software product line?
- What are the requirements engineering tasks specific to software product lines?
• What is the role of product line scoping in software product line engineering? How does scoping relate to requirements engineering for a software product line?
• Is building a feature model sufficient for modeling software product line variability?

IV. Themes for Presentation

Themes will be assigned by the assistant who tutors this course; your group can apply for a theme.

A. Feature-Oriented Domain Analysis
What is the basic approach for domain analysis? What does a feature model express? What is the purpose of a feature model? What advanced forms of feature models exist? How do they differ? What are the benefits and limitations of feature modeling for domain analysis? How are feature models used in the software product line engineering process?

B. Specifying Product Line Variability in Requirements Models
What is product line variability? Why is there a need to specify product line variability in requirements specifications? What are the two approaches to extending existing modeling languages to support variability modeling? How does feature unwrapping reduce the effort for specifying variability in requirements models?

C. Product Derivation with Requirements Models
How can a requirements model be derived from a product-line specification? Explain briefly both approaches for production derivation and contrast them. What are their advantages and limitations?

References


