ABSTRACT

The development of individual softwares in a certain domain tends to reinvent the wheel of things like the software requirements or other components being develop. In order to minimalize the tendency of reinventing the wheel and to improve the reusability of requirements and other components in software development, it would wise if those common requirements and other components were documented. In order to accommodate the need of certain segmentated user, the commonality and variability requirements are needed to be explore. The way to do all those things is called software product line engineering (also known as domain engineering). This technique is a way to define the commonality and variability of a software product line. A software product line is a set of software which has the same software domain.

In this thesis research, the research of software product line engineering is focused in the domain of university's academic information system. The limitation of this research is that in this research is only defining the commonality and variability requirements of university's academic information system software product line. This process is part of the domain requirement engineering sub-process of the domain engineering process in software product line engineering. To define the commonality and variability requirements, the existing requirements from the existing university's academic information system are being used as research subject. Those requirements are from University of Indonesia's, University of Riau's and STT PLN's academic information systems. The method to define the commonality and variability requirements is called Application-Requirements Matrix and the result is modeled using Feature-Oriented Domain Analysis. According to Bockle, Pohl and Linden in their book [Bockle *et al*, 2005], having commonality requirements as much as possible are important because it would decrease the amount of variability requirements to build a minimum requirements application.

The result of this thesis research is the definition of commonality and variability requirements of university's academic information system. In the result of this research, it shows that the amounts of commonality requirements are less than the amount of the variability requirements. This happens due to the major differences of the requirements complexity from the three data used in this research. Last but not least, the result of this research is hoped to be the beginning of researches in software product line engineering especially in the domain of university's academic information system.

Keyword: software product line engineering, domain engineering, commonality, variability, application-requirements matrix, feature-oriented domain analysis

viii+61 pages; 13 figures, 4 tables; 7 attachments
Bibliography: 11 (1983 – 2008)

ABSTRAK

Pengembangan suatu *software* dalam suatu *domain* yang sama secara individual seringkali menyebabkan terjadinya kondisi *reinventing the wheel* baik terhadap *requirements* maupun komponen lain yang dikembangkan. Untuk meminimalisir kondisi *reinventing the wheel* dan meningkatkan metoda *reuse* maka alangkah baiknya jika *requirements* hingga komponen lain yang bersifat umum (*common*) diantara *software* dalam *domain* tersebut dapat didokumentasikan. Selain itu, *requirements* hingga komponen lain yang bervariasi (*variable*) antar *software* dalam *domain* tersebut juga diharapkan bisa terdokumentasi agar kebutuhan segmentasi pengguna tertentu dapat terpenuhi. Hal-hal tersebut dilakukan dalam suatu teknik yang disebut *software product line engineering* atau disebut juga *domain engineering*. Pada teknik ini dilakukan pendefinisian dan pengembangan *commonality* dan *variability* dari suatu *software product line*. *Software product line* merupakan kumpulan aplikasi-aplikasi *software* yang berada dalam satu *domain* aplikasi yang sama.

Pada penelitian tesis ini dilakukan *software product line engineering* pada *domain* sistem informasi akademik perguruan tinggi. Hanya saja pada penelitian ini dibatasi pada pendefinisian *commonality* dan *variability requirements* dari *domain* sistem informasi akademik perguruan tinggi (atau hanya melakukan sub-proses *domain requirements engineering* dari proses *domain engineering* dari *software product line engineering*). Pada pendefinisian *commonality* dan *variability requirements* digunakan *existing requirements* dari sistem informasi akademik perguruan tinggi yang sudah ada. Sistem informasi akademik tersebut adalah sistem informasi akademik Universitas Indonesia, Universitas Riau dan STT PLN. Metode yang digunakan untuk mendefinisikan adalah *Application-Requirements Matrix* dan kemudian dimodelkan dengan menggunakan *Feature-Oriented Domain Analysis*. Menurut Bockle, Pohl dan Linden dalam bukunya [Bockle *et al*, 2005] bahwa mendapatkan jumlah *commonality* sebanyak mungkin adalah penting agar mengurangi jumlah *variability* untuk kebutuhan minimum aplikasi.

Hasil dari penelitian tesis ini berupa definisi *commonality* dan *variability requirements* untuk *software product line* sistem informasi akademik perguruan tinggi. Namun, dari hasil penelitian ini terlihat bahwa jumlah *commonality requirements* lebih sedikit jumlahnya dibanding *variability requirements*-nya. Hal ini disebabkan karena terdapat perbedaan kompleksitas *requirements* dari ketiga data dalam penelitian ini. Akhir kata, semoga hasil penelitian tesis ini merupakan awal dari penelitian lanjutan bidang *software product line engineering*, khususnya untuk *domain* sistem informasi akademik perguruan tinggi.

Kata kunci: software product line engineering, domain engineering, commonality, variability, application-requirements matrix, feature-oriented domain analysis

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