Setting Up COTS-Based Software Product Lines

Faheem Ahmed, Luiz Fernando Capretz, Miriam M. A. Capretz
University of Western Ontario
London, Ontario, Canada, N6A 5B9
fahmed@engga.uwo.ca, lcapretz@eng.uwo.ca, mcapretz@eng.uwo.ca

1. Introduction

A software product line is a set of software-intensive systems sharing a common, managed set of features that satisfy the specific needs of a particular market segment or mission and are developed from a common set of core assets in a prescribed way [1]. Many organizations that deal in wide areas of operation, from consumer electronics, telecommunications, and avionics to information technology, are using software product lines practice, because it deals with effective utilization of software assets [2]. Although software product line is gaining popularity due to economical impacts, there has not been a great deal of research in establishing appropriate models for developing software product line from COTS. By having controlled variability and in satisfying the market demands a product line can be built around a set of COTS by analyzing the products to determine the common and variable features.

2. Background

The model in Figure 1 focuses on and encourages use and reuse of COTS from repository within an application domain. The model has two phases, Domain Engineering and Application Engineering. The Domain Engineering consists of two views, Product Line Infrastructure View and COTS Archive View. The Application Engineering has two views, Product Line Application View and COTS Utilization View. Each view describes the development process with respect to its perspective and identifies the core activities to be performed in that view. To adjust them to satisfy the overall software product line requirements, the activities of different views provide feedback to one another. The Domain Engineering phase of the model establishes an infrastructure for software product line and constructs a COTS repository for product development. During the Domain Engineering phase, we initiate Product Line Infrastructure View and COTS Archive View. The iterations in the activities of Product Line Infrastructure View and COTS Archive View provide feedback to one another. The aim is to generate a COTS repository, which fulfills the product line requirements and meets the production constraints. In the Application Engineering phase of the H-Model actual products are developed from the COTS present in the COTS repository. In this phase, activities of the Product Line Application View interact with the activities of the COTS Utilization View to produce required products.

Figure 1: COTS-based SPL Model

3. Conclusion

The model presented here integrates the concept of software product line and COTS to come up with a prescribed way of establishing COTS-based software product line. The interdependency of various activities of software product line and COTS shows a strong relationship within a common framework of product development. In order to validate the model, we developed a software product line for an E-Commerce domain.

4. References