Towards an Integrated AORE Process Model for Handling Crosscutting Concerns

Abstract

The two fundamental principles in software engineering to deal software complexity are separation of concerns and modularity. A lot of techniques exist in literature adopting these fundamental principles and some success in this direction has been achieved. Despite this improvement, still complete separation of concerns is not achieved and is far from adequate. Aspect-Oriented Software Development is another step towards achieving improved modularity and aims to advanced separation of concerns. It handles crosscutting concerns in an efficient manner by encapsulation them in separate modules called aspects and further uses composition mechanism to integrate them with core concerns. Handling crosscutting concerns in the early stages of software development is beneficial rather than handling them in later stages of software development because it not only makes the design simpler, but also helps to reduce the cost and defects that occur in the later stages of development. Aspect-Oriented Requirements Engineering (AORE) focuses on identifying, analyzing, specifying, verifying, and managing the crosscutting concerns at the early stages of software development. In last few years, many researchers contributed their significant efforts in this area but, still it is not sufficient. In this paper, we have proposed such an approach that incorporates aspect-oriented concepts and which includes concern management as a key separate activity that is not clearly mentioned earlier in literature. Also, traceability is an essential activity to accommodate changes
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in requirements but it is very difficult to implement. Organizing large numbers of requirements into meaningful and more manageable groups and negotiating specification with clients can make traceability easier to implement and maintain. The proposed approach supports identification, management, specification, and composition of all concerns.

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