

Abstract

Testing is a critical activity in the software development process in order to obtain systems of high quality. Tieto typically develops complex systems, which are currently tested through a large number of manually designed test cases. Recent development within software testing has resulted in methods and tools that can automate the test case design, the generation of test code and the test result evaluation based on a model of the system under test. This testing approach is called model-based testing (MBT).

This thesis is a feasibility study of the model-based testing concept and has been performed at the Tieto office in Karlstad. The feasibility study included the use and evaluation of the model-based testing tool Qtronic, developed by Conformiq, which automatically designs test cases given a model of the system under test as input. The experiments for the feasibility study were based on the incremental development of a test object, which was the client protocol module of a simplified model for an ATM (Automated Teller Machine) client-server system. The experiments were evaluated both individually and by comparison with the previous experiment since they were based on incremental development. For each experiment the different tasks in the process of testing using Qtronic were analyzed to document the experience gained as well as to identify strengths and weaknesses.

The project has shown the promise inherent in using a model-based testing approach. The application of model-based testing and the project results indicate that the approach should be further evaluated since experience will be crucial if the approach is to be adopted within Tieto's organization.