Abstract

Microscopy techniques reveal new possibilities for studying biological processes and produce a huge amount of data. Besides high resolution images, data from literature research, experimental design, image quantification, analysis as well as comparison of the results is generated by microscopy experiments. The project Scientific Microscopy Lab Environment (SMILE) addresses the organization and management of information gained by these experiments.

The objective of this thesis was to design and implement a module within SMILE which handles the management of data acquisition in a project-oriented way. This includes experiment design, processing of experiment series, as well as storing of acquired experiment data. It allows the definition of experiments which follow specific protocols. Additionally these protocols can be stored as standard protocols in order to be reused and modified in other experiments.

The digital lab book was realized using a three tier J2EE architecture providing a web-based user interface. A model driven development approach with novel technologies like the Spring Application Framework as business backend and Tapestry for the web frontend were used.

This work resulted in a platform independent web application which covers the workflow of data acquisition during a microscopy experiment in an intuitive way and will be used in productive laboratory environment.

Keywords: *microscopy experiment, SMILE, MDA, J2EE*