Collaborative Software Architecting with an Extensible Web-based Workbench

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Aim

The primary goal of this dissertation is development of an extensible web-based workbench for collaborative software architecting and a graphical tool, added to the workbench, for modeling of software architecture based on the 4+1 architectural view model.

Objectives

Primary Objectives

1. Development of a workbench for software architecting providing the following functionalities:
   - Adaptability to the user - recognition of the user, after login, and presentation of the projects related to them.
   - After login, the user will be able to make a new project and select the tool with which to amend it.
   - Support for collaborative work:
     - after login, the user will be able to add collaborators to a project from their project's list.
     - when using the design tool and if working in collaboration the user will be able to see the amendments made to the project by the other collaborators, given they use the same view.
   - Saving and loading of the data – support for iterative architecting.
   - Extensibility – facilitation of easy programmatic addition of menus and menu items to the workbench.
2. Development of a plug-in graphical tool for modeling of software architecture and addition of the tool to the workbench. The tool will provide the following capabilities:
   - Generation of a graphical model of the designed architecture based on the 4+1 architectural view model.
   - Generation of XML file representing the generated architectural model.
   - Extensibility – facilitation of easy programmatic addition of views, entities, and relations to the design tool.
3. Build a case study used for evaluation of the developed software.

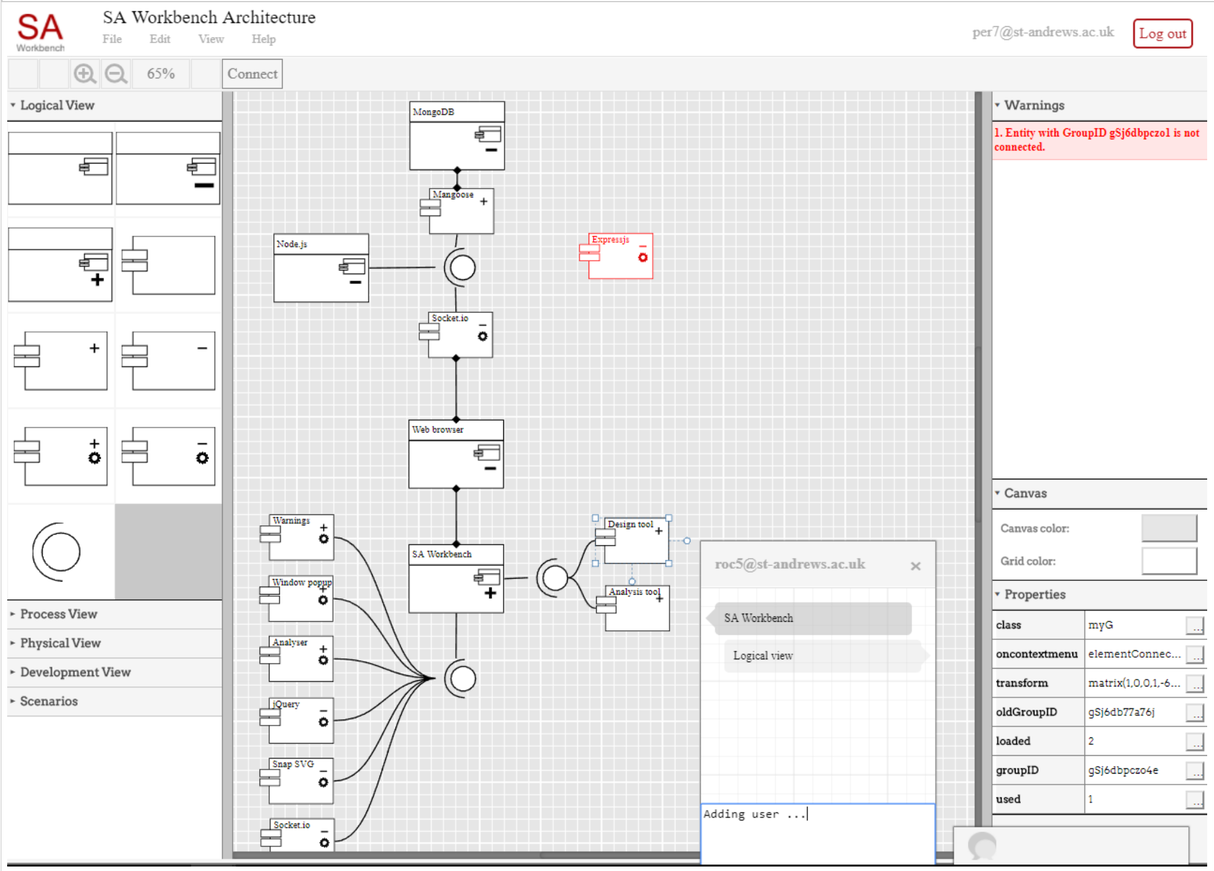
Secondary Objectives

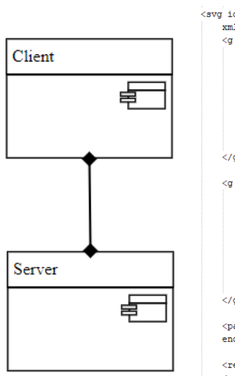
1. Addition of the following functionality to the workbench:
   - Support for collaborative work – addition of chat functionality.
   - Customization of the working environment.
2. Addition of the following functionality to the graphical tool:
   - Development of rules for validation of each generated view.
   - Development of, integrated into the design tool, tool for analysis of the generated design.
   - Extensibility – facilitation of easy programmatic addition of custom rules to the integrated analysis tool.

Tertiary Objectives

1. Addition of the following functionality to the analysis tool:
   - Addition of functionality for downloading of the XML file representing a given view and, after upload, merging it with the same view belonging to another project.
2. Addition of the following functionality to the workbench:
   - Development of a plug-in tool for validation to the uploaded XML file, representing a given view, used before merge of two views.

SA Workbench



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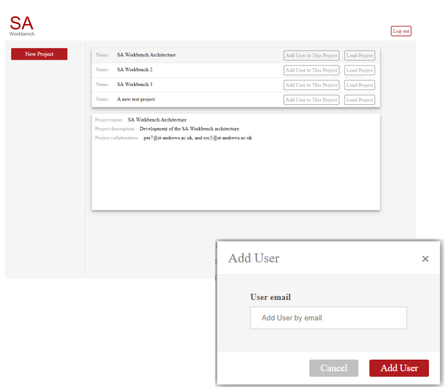
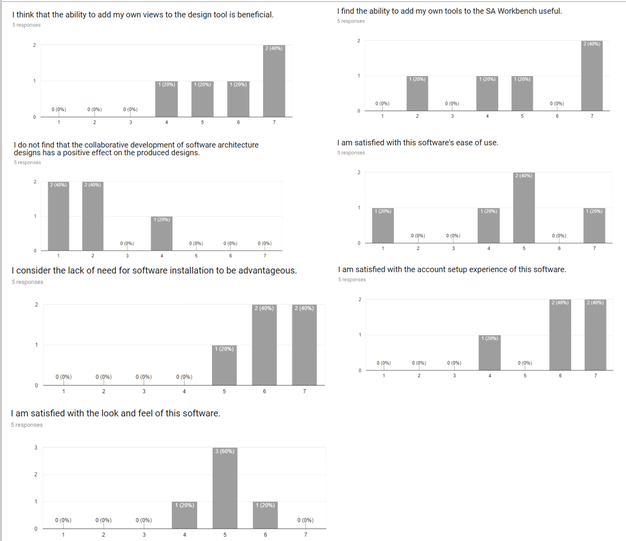
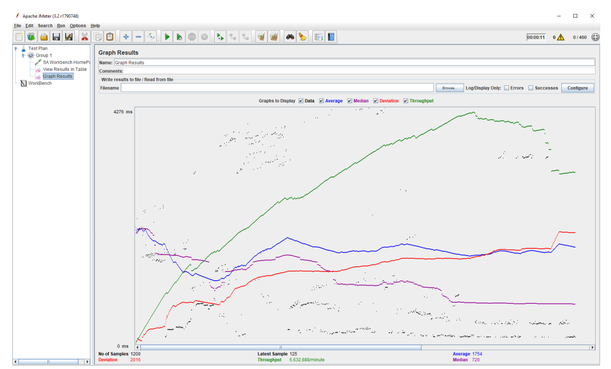


User study



Tests



Results

The results from the survey show that the participants are satisfied with the look and feel of the web application and the account setup experience. Additionally, the results suggest that the participants find that the lack of installation need is an advantage, that the collaborative work has a positive effect on the produced designs and that the extensibility of the system is useful. Moreover, most of the users are satisfied with the ease of use of the software.