Abstract

to the thesis

Web-based systems, processing large data arrays

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The attention of this diploma work is focused on major web-based systems. Their main characteristics are large number of concurrent users, large data arrays (can be also considered as long lists with objects) and constant pressure or large number of active sessions.

The diploma work overviews project stamps giving contemporary solutions for the software skeleton that works with large data arrays and gives suggestions on their usage. There are three types of project stamps depending on the specifications of the different systems: convenient for management of complex, multi-leveled systems ; convenient for management of communication with data carriers and convenient for achieving higher software performance.

Showcased are techniques, related to design the data visualization in a way as convenient as possible for the regular users. The design principles of the user interface are deeply analyzed, by having in mind the requirements for presenting the large amount of data and constructing resource-saving queries against the server. Techniques related to the design of the server processes used for taking out and preparing the data visualization are also overviewed.

One of the most important features of any software processing with large data arrays is its performance speed. Strategies for performance optimization on the highest software levels are showcased in this diploma work. The different strategies include analysis of the system requirements, object-orientated design, testing and profiling. Apart of that, you will find also approaches how to optimize the application performance on the low software levels – the source code level. Those techniques are showcased by good practices on how to wright quality and high-performance source code.

A web-based application, demonstrating three different approaches for large data array processing (traditional, Page-by-Page Iterator and Value List Handler) is also presented. A comparison has been made and the results of testing under different conditions are reviewed depending on the number of active sessions and the amount of data to visualize.