USE OF THE DJANGO FRAMEWORK IN THE WEB APPLICATION FOR COMPUTER-BASED TESTING OF HIGHER EDUCATION INSTITUTION STUDENTS

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Nowadays there is no higher education institution, where testing the academic achievement levels of students is not used to a certain degree. The current level of information technology development and its use in education has led to the transition from conventional (blank) testing to computer-assisted testing, which is based on the use of special software. That allows significantly reduce the time spent on such time-consuming tasks as preparing test content to assess the level of academic achievement of students, administering the tests and grading the related pieces of work. Also, it can increase the objectivity of the evaluation.

An overview of existing software products [1] has shown that commercial systems for computer-based testing have a rather limited spread in higher education due to economic factors, and often the complexity of their adaptation for a certain application domain. On the other hand, free software for automation of testing does not always have the required functionality, in particular, a fairly flexible evaluation system. Thus, it was decided to develop our own software system for computer-based testing using modern web technologies. It makes it possible to administer tests for a student group of 15 – 20 people simultaneously and does not require any additional software, apart from a web browser, to be installed on the user computer.

As known, most web applications are developed with some kind of server-side web framework. So, we have analyzed various web frameworks and selected the Django [2]. Django is a free and open-source framework for developing back-end of web applications in Python programming language. It allows you to create flexible, well-structured web applications in a short time. One of the main principles of the framework is DRY.

The Django project can contain one or more web applications. Also, unlike many other frameworks, URL handlers in the Django are configured explicitly and not automatically defined by the controller structure. A significant advantage of the Django also is the built-in administrative panel, which design to manage all data in the database quickly and conveniently.

The architecture of the Django is similar to the Model-View-Controller (MVC). The controller of the classic MVC model is roughly equivalent to the level that the Django calls "View", and the presentation logic is implemented in the Django by the level of Templates. Because of this, the Django architecture is often referred to as "Model-Template-View" (MTV).

The web framework can work with DBMSs like PostgreSQL, MySQL, SQLite, Microsoft SQL Server, Oracle, etc. In the system of computer-based testing we use the SQLite DBMS so far. It maintains lightweight relational databases, which do not require any installation or administration. Each database is stored in a cross-platform file on the disk. To work with data, the Django uses its own object-relational mapping subsystem, where the data models are described as Python classes, and the database schema is generated on the basis of the models. As a rule, each model corresponds to single table of the database. The developed data models consist of classes Question, Choice, Discipline, Test, Student, AcademicGroup, Faculty, TestTakingSession, TestTakingResult.

To sum it up, the Django web framework is great for developing a functional and affordable web applications as soon as possible.

References

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