RESEARCH ARTICLE

Creation and Management of An Electronic Test Bank in The Field of Sciences Based on A Telegram Bot

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Abstract

This project focuses on developing and managing an electronic test bank for academic subjects through a Telegram bot. The server side is built using Django and DRF, while user interaction is implemented with the Aiogram library. Teachers can create and organize questions in various formats, and students can take tests via the bot and instantly view their results. The system enhances the educational process by making it more interactive, transparent, and efficient.

KEYWORDS

Django, DRF, Aiogram, Telegram bot, electronic test bank, e-learning system.

INTRODUCTION

In the educational process, tests are one of the most effective and widely used methods of assessing knowledge. Tests allow teachers to accurately, transparently and in a short time to control students' knowledge, and for students they serve as an important tool for independently checking their level of knowledge, identifying and eliminating their shortcomings. At the same time, creating tests, correctly categorizing them by subject, controlling the level of difficulty and content, and systematically recording the results remains a complex and time-consuming process for teachers.

In recent years, the introduction of information technologies into education has opened up new opportunities for effective management of this process. In particular, the use of special bots created on the basis of mass messengers such as Telegram creates convenience in organizing tests. Such an approach not only provides students with the opportunity to take tests anywhere and at any time, but also simplifies the creation of tests, monitoring and management of results for teachers.

This article considers the concept of a single electronic test bank created on the basis of a Telegram bot. The main goal of this system is to centrally store tests across disciplines, automate their use, and provide opportunities for scientific analysis of the results.

METHOD

The main principle of the proposed system is to form a centralized test bank and manage it via a Telegram bot. Test questions are divided into separate categories by subject, each of which is marked with a topic and difficulty level. This approach ensures that tests are stored in a consistent and systematic manner, as well as makes it convenient for teachers to quickly find and use the necessary questions.

The system architecture consists of two main modules: the user (student) and administrator (teacher) modules. The module created for students allows them to take tests, view results, and independently assess their level of knowledge. The module intended for administrators provides the ability to add new questions, edit or delete existing ones, and monitor and analyze results. This completely digitizes the process of

organizing and managing tests in the educational process.

The database plays an important role in ensuring the stable operation of the system. Questions, answer options, and user results are stored in PostgreSQL databases. This solution allows for rapid processing, storage, and analysis of large amounts of data. Also, since the results are automatically recorded in the database, it will be convenient for teachers to conduct statistical analysis and determine the effectiveness of the learning process.

Technically, the project is built on Django and Django Rest Framework, which ensure data exchange and system reliability. The Telegram bot is developed using the Aiogram library, which provides fast and convenient communication between the user and the system. This integration simplifies the process of organizing tests, recording results and managing them, and allows you to work in harmony with modern educational requirements.

RESULTS

The implementation of the system provides a number of conveniences for teachers and students. Students have the opportunity to take tests anywhere and at any time and independently assess their level of knowledge. This process enhances independence in education and increases students' motivation to control their own knowledge.
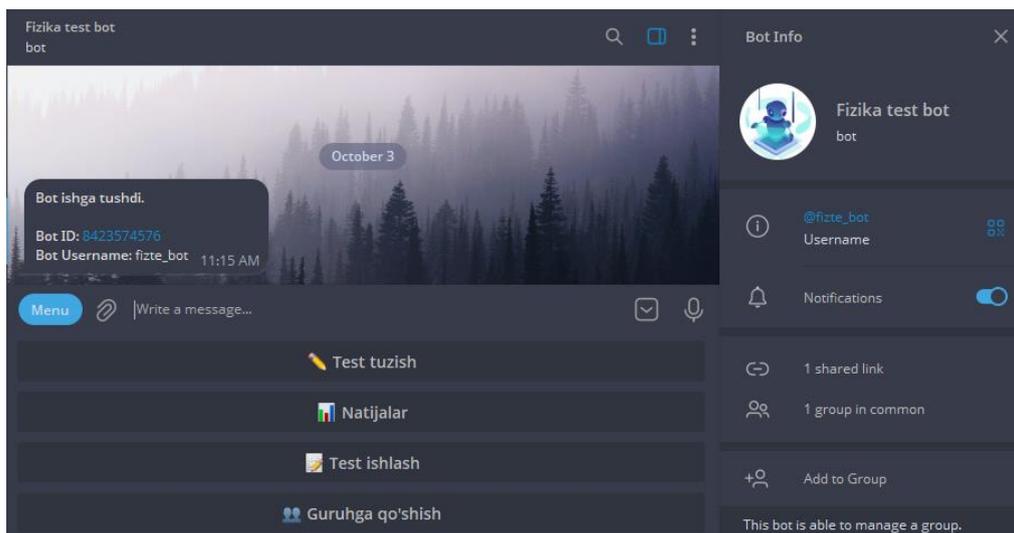

Figure 1. Bot interface for the teacher

For teachers, it is possible to create and manage a single test bank across disciplines. The ability to store test questions in an organized manner, quickly edit them, and add new questions saves teachers time and makes it much more convenient to conduct tests during the lesson. Automatic recording of results and their real-time monitoring ensure transparency of the assessment process (Figure1).
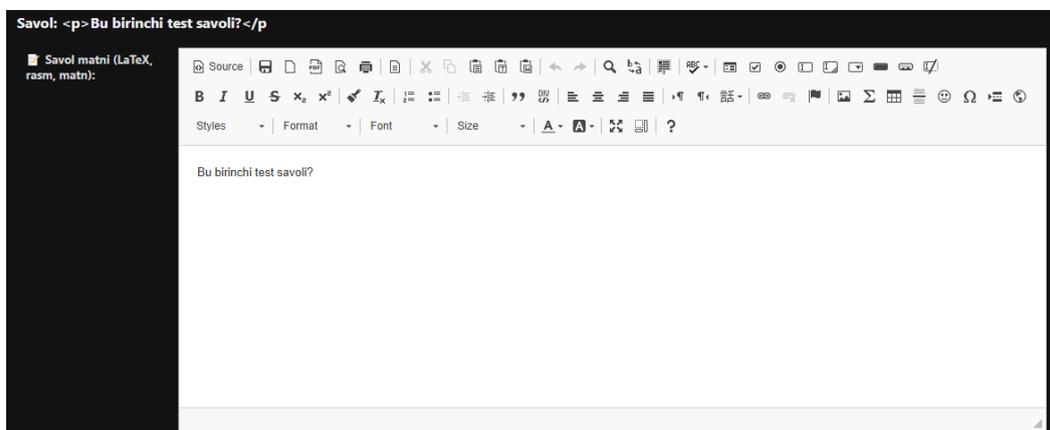

Figure 2.

Through a special editing window (Figure 2), questions are entered in the form of text, formulas or images. This system, developed based on CKEditor, allows you to fully format questions. In Figure 3, we can see the test window for users.

The efficiency of the system is expressed not only in saving time, but also in the possibilities of statistical analysis. Teachers will be able to identify the most frequently made mistakes in the questions, analyze the average score indicator, and see the shortcomings in the overall learning process. This will increase the quality of the educational process and create the opportunity to plan curricula more effectively.

CONCLUSION

The test bank created on the basis of the Telegram bot proves to be an effective tool in the educational process. This system provides teachers with convenience in creating tests, categorizing them by subject, and monitoring the results. Students are provided with the opportunity to test their knowledge level at any time and receive their results immediately.

Savol 1:

Yorug'likning vakuumdagi tezligi taxminan qancha?

- A. 3×10^{8} m/s
- B. 3×10^{6} m/s
- C. 3×10^{5} km/s
- D. 3×10^{7} m/s

Savol 2:

Ohm qonuni qaysi munosabatni ifodalaydi?

- A. F=ma
- B. P = U · I
- C. U=I · R
- D. E=mc^2

Savol 3:

Qaysi kattalik **skalyar** kattalik hisoblanadi?

- A. Kuch
- B. Tezlik
- C. Masofa
- D. Kuch momenti

The proposed approach centralizes control and assessment in the educational process, saves time and resources, and ensures the transparency of assessment. Also, based on the results collected in the system, teachers will have the opportunity to conduct a deeper analysis of the students' knowledge level and identify shortcomings in the educational process.

There are opportunities for further improvement of the system in the future. In particular, it is possible to expand the test bank through the introduction of adaptive testing mechanisms and automatic question generation using artificial intelligence. Such development will further increase the efficiency of the educational process.

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