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CREATING AN INTERACTIVE MOBILE APPLICATION FOR TESTING STUDENTS' KNOWLEDGE IN THE DART PROGRAMMING LANGUAGE

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Annotation

This article discusses the technological and pedagogical aspects of creating an interactive mobile application called *Testchi* for assessing students' knowledge. The application is developed using the Dart programming language and Flutter framework. The paper analyzes the structure, working principles, and functional capabilities of the application. Special attention is given to the role of mobile applications in improving students' learning outcomes through interactive testing, instant feedback, and gamification elements. The system allows users to participate in tests, select answers, and receive instant feedback based on their performance. The proposed solution aims to improve accessibility, usability, and efficiency in knowledge assessment systems.

Keywords

Mobile application, quiz system, knowledge assessment, user interface, Android, Flutter, testing system.

Introduction

Today, digital technologies are becoming an essential part of the education system. Mobile applications, in particular, provide new opportunities for organizing the learning process in a more flexible, efficient, and interactive way. Students can access educational resources anytime and anywhere using mobile devices.

Interactive testing systems play an important role in evaluating students' knowledge. Traditional assessment methods often require more time and effort, while mobile applications allow automatic and fast evaluation. Therefore, developing a mobile-based testing application is one of the actual directions in modern education.

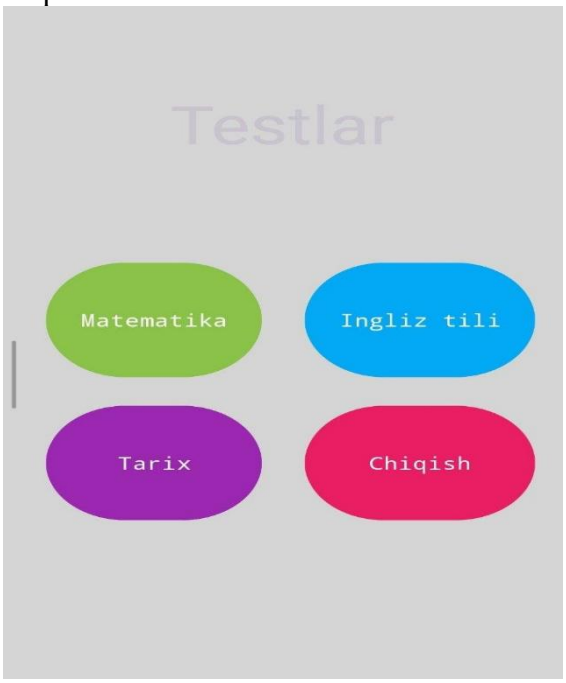
Main Part

The Dart programming language and Flutter framework enable developers to build high-performance, cross-platform mobile applications efficiently. Based on these technologies, the *Testchi* application was developed to improve students' knowledge assessment process.

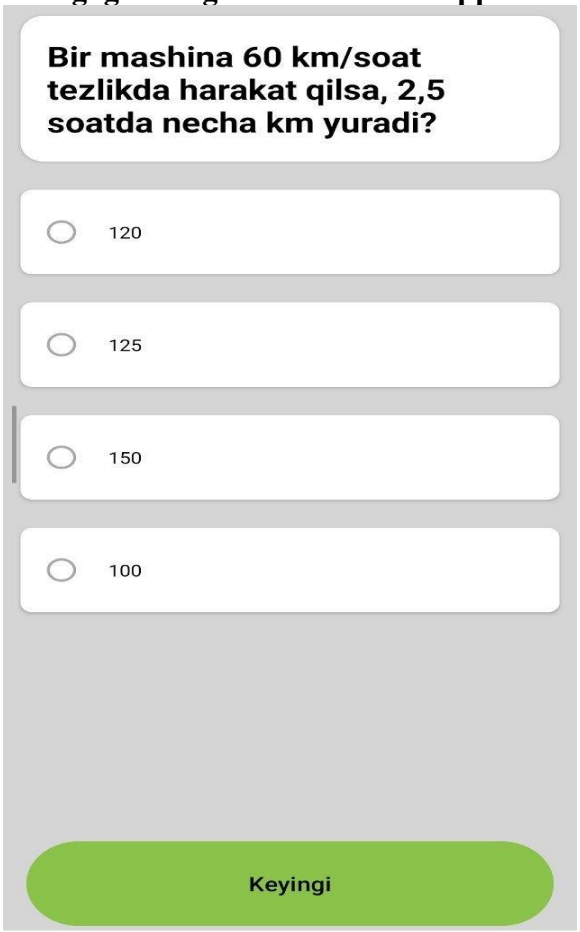
With the rapid development of mobile technologies, digital learning and assessment tools have become increasingly popular. Traditional testing methods are being replaced by automated systems that provide faster and more accurate evaluation.

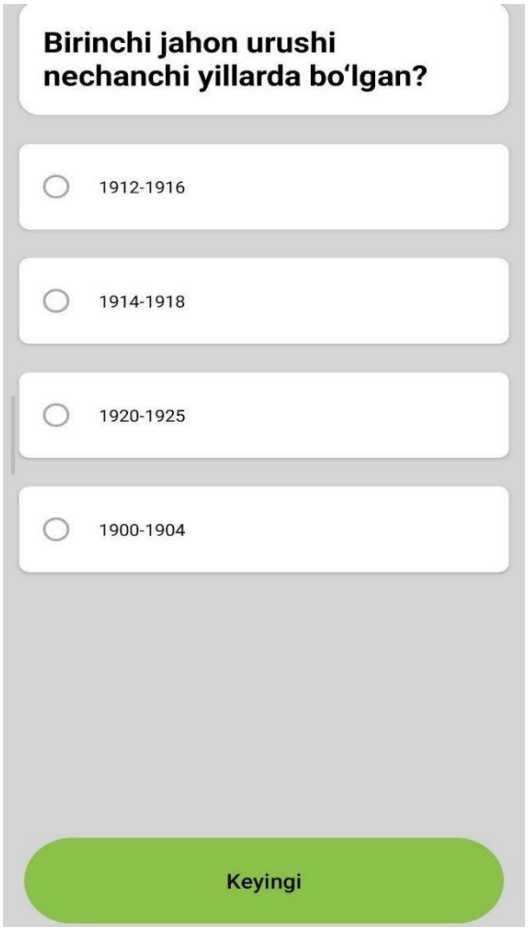
The *Testchi* application is designed as a mobile-based testing platform that allows users to assess their knowledge in an interactive way. The system provides a user-friendly interface and ensures efficient processing of test results.

System Architecture: The application follows a layered architecture consisting of three main components:



Pedagogical Significance of the Application





The *Testchi* mobile application performs several important pedagogical tasks: providing quick and objective knowledge assessment;

- strengthening learned materials through tests;
- increasing students' motivation and interest;
- developing independent learning skills;
- enabling self-assessment and progress tracking.

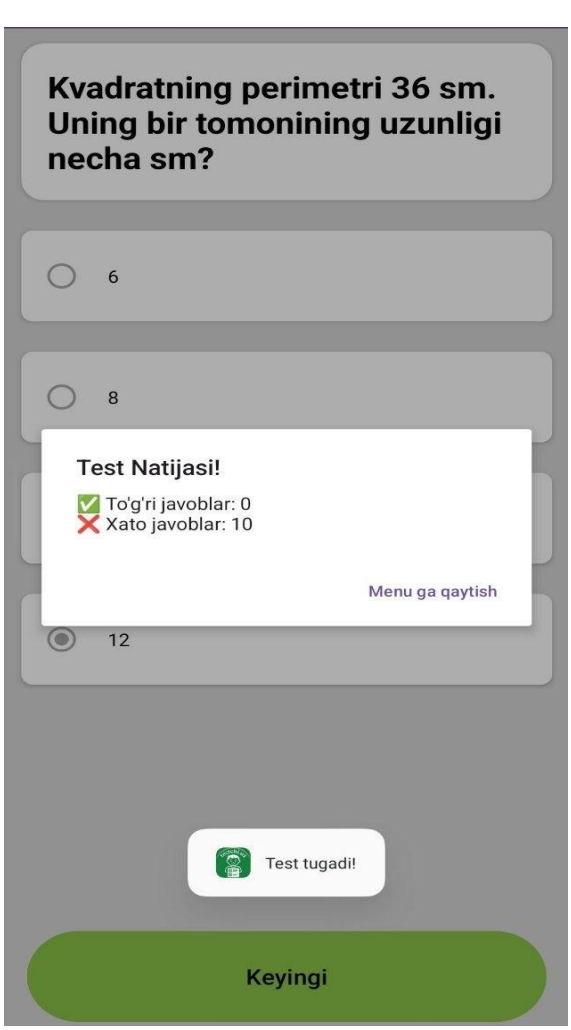
Interactive testing helps students better understand their mistakes and improve their performance.

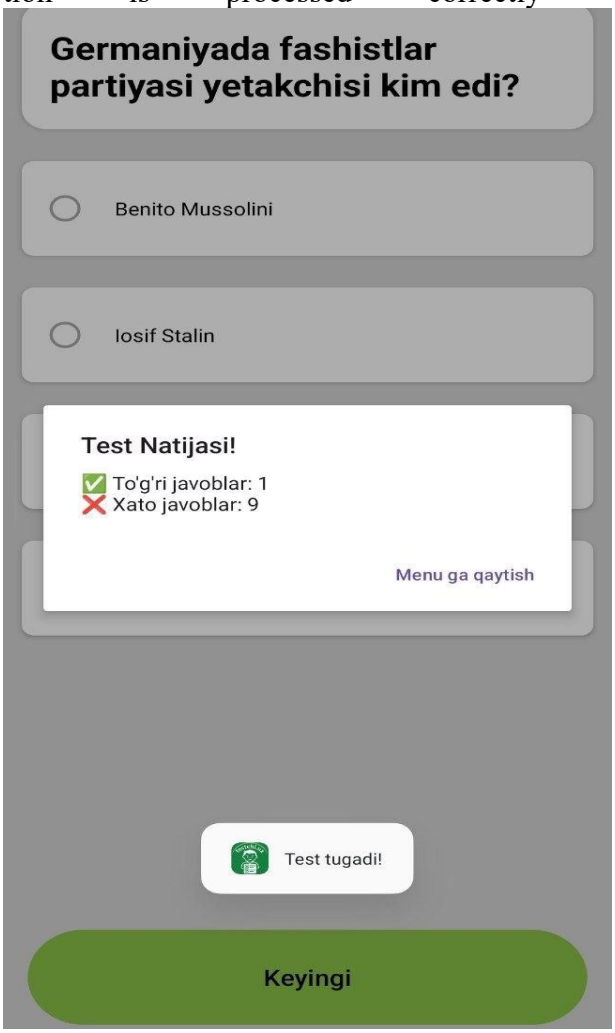
Presentation Layer: This layer is responsible for the user interface. It includes:

- Main screen (activity_main)
- Menu screen (activity_menu)

These components handle user interaction and display content dynamically.

The logic layer controls: Test flow management, Answer validation, Score calculation. It ensures that each user action is processed correctly and





The data layer manages: Questions, Answer options, Correct answers.

Data can be stored locally using structured formats such as arrays or files.

Step 1: Application Initialization

When the application starts: The main interface is loaded, Users are presented with available options.

Application Structure and Working Principle

The application is built based on a simple and efficient architecture. It consists of the following components: main interface (home screen); menu and navigation system; test module; result evaluation module. The working process of the application includes the following steps:

1. the application starts and displays the main screen;
2. the user selects the test option from the menu;
3. questions are loaded from the database;
4. each question is displayed sequentially;
5. the user selects an answer;
6. the system checks the answer and updates the score;
7. after all questions are completed, the result is shown.

This step-by-step algorithm ensures smooth and efficient operation of the system. Users can navigate through the application using menu options. The transition between screens is handled through activity-based navigation.

The application is developed using:

- Dart programming language;
- Flutter framework for UI design;
- XML layouts for interface structuring (in Android components);

The use of Flutter allows:

- fast development process;
- cross-platform compatibility;
- modern and responsive user interface design.

Once the test begins: Questions are loaded into memory, the first question is displayed. The *Testchi* application provides several advantages:

1. fast and automatic knowledge assessment;
2. increased student engagement;
3. interactive and user-friendly interface;
4. support for independent learning;
5. time-saving evaluation process;
6. easy scalability and future improvements;
7. accessibility anytime and anywhere.

For each question: the user selects an answer, the system compares it with the correct answer, the score is updated accordingly. The application positively affects the educational process: improves students interest in learning, enhances understanding through practice, provides instant feedback, supports teachers in assessment; allows monitoring of student performance.

The *Testchi* application is an effective solution for mobile-based knowledge assessment. Its modular architecture ensures scalability and ease of maintenance. Future improvements may include: online database integration, user authentication, advanced analytics for performance tracking.

Conclusion

In conclusion, the development of the *Testchi* mobile application demonstrates the effectiveness of using modern technologies in education. The application serves as a practical tool for knowledge assessment and contributes to improving the quality of learning.

The use of interactive elements and automation makes the system efficient and user-friendly. In the future, the application can be enhanced by adding online databases, user accounts, analytics systems, and adaptive testing features.

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