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Online Quiz System with Automated Scoring and Administrative Control

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***Abstract*—** The Online Quiz System with Automated Scoring and Administrative Control is a web-based application designed to conduct quizzes and online assessments efficiently. The system allows students to register, log in, attend quizzes, answer questions, and submit their responses through an online platform. After submission, the system automatically evaluates the answers and calculates the score, percentage, and result. The system also provides an administrative control panel through which administrators can create and manage quizzes, add and update questions, define correct answers and marks, manage users, and monitor quiz results. Quiz and user information is stored in a database. The proposed system reduces manual evaluation, saves time, improves scoring accuracy, and provides immediate results to students.

***Index Terms*—** Online Quiz, Automated Scoring, E-Learning, Web Application, Quiz Management, Database, Administrator, Online Assessment.

I. INTRODUCTION

Online assessment has become an important part of modern education. Traditional quiz systems generally require teachers or administrators to manually prepare questions, evaluate answers, calculate marks, and prepare results. These activities require considerable time and may result in human errors. The proposed Online Quiz System provides a computerized solution for conducting quizzes. Students can access quizzes through the web application and submit their answers online. The system evaluates objective answers automatically and generates the result immediately. An administrative control panel allows authorized users to create quizzes, manage questions and answers, assign marks, manage users, and monitor results.

II. PROBLEM STATEMENT

Traditional quiz and examination systems often involve manual question management, answer evaluation, and result calculation. These processes can be time-consuming and may lead to calculation or evaluation errors. Students may also need to wait before receiving their results. The proposed system addresses these problems by providing an online platform where students can attend quizzes, submit answers, and receive automatically calculated scores. Administrators can manage quizzes, questions, users, marks, and results through a centralized administrative panel.

III. OBJECTIVES

The key technical objectives include:

1. Develop an online platform for conducting quizzes.
2. Allow students to register, log in, and participate.
3. Provide automatic evaluation and scoring.
4. Generate instant results and performance metrics.
5. Allow administrative CRUD operations for quizzes.
6. Provide user and mark administration controls.
7. Reduce evaluation overhead and human error.
8. Persist user, question, and result data in a DB.

IV. LITERATURE REVIEW

Online quiz and assessment systems are widely used to support digital education and computer-based testing [6]. Existing systems generally provide features such as user authentication, question management, online examinations, automatic evaluation, and result generation. Traditional assessment methods require teachers to manually check answers and calculate marks. Automated assessment systems can reduce this workload by evaluating objective-type answers using predefined correct answers. The proposed system combines online quiz participation, automated scoring, result generation, and administrative management in one application.

V. PROPOSED SYSTEM

The proposed Online Quiz System is a web-based application consisting of two major categories of users: students/users and administrators. Students can register, log in, view available quizzes, attend quizzes, submit answers, and receive automatically calculated results. Administrators can create and manage quizzes, add/update/delete questions, set correct answers, assign marks, manage registered users, and monitor quiz results.

VI. SYSTEM WORKFLOW

The basic workflow is: User Registration → Login → Quiz Selection → Attempt Quiz → Submit Answers → Automatic Evaluation → Score Calculation → Result Display. For the administrator: Admin Login → Create Quiz → Add Questions → Set Answers & Marks → Manage Users → Monitor Results.

VII. SYSTEM ARCHITECTURE

The system is organized into three main layers:

A. *Presentation Layer*

Provides registration, login, quiz pages, result pages, and administrative screens.

B. *Application Layer*

Handles authentication, quiz processing, answer evaluation, score calculation, result generation, and administrative operations.

C. *Database Layer*

Stores users, quizzes, questions, answers, marks, and results.

VIII. FUNCTIONAL REQUIREMENTS

Key functional specifications comprise:

- User registration and login authentication.
- Administrator privileges and management.
- Quiz and question creation/deletion.
- Correct-answer key configuration.
- Marks assignment per question.
- Interactive online participation.
- Automatic response evaluation.
- Dynamic score and percentage computation.
- Result view dashboard for students.
- User account management and analytics.

IX. NON-FUNCTIONAL REQUIREMENTS

Performance: Quiz submissions and result generation should execute rapidly. *Security:* User credentials and quiz data must be safeguarded via authentication. *Usability:* The UI must remain clear and responsive. *Reliability:* Marks and records must be reliably logged. *Scalability:* The design must support expanded content and concurrent sessions.

X. TECHNOLOGY AND TOOLS

The stack leverages web engineering standards including HTML [1], CSS, and React.js [2] on the client side, Node.js [3] and Express.js [4] for server application logic, and MongoDB [5] for database persistence with RESTful APIs.

XI. DATABASE DESIGN

Entities include: **User** (User ID, Name, Username, Password, Role), **Quiz** (Quiz ID, Quiz Name, Description, No. of Questions, Total Marks), **Question** (Question ID, Quiz ID, Question Text, Options, Correct Answer, Marks), and **Result** (Result ID, User ID, Quiz ID, Score, Percentage, Date).

XII. AUTOMATED SCORING

The server compares student responses against correct entries. Equations governing computation:

$$Score = N_{\text{correct}} \times M_{\text{question}} \quad (1)$$

$$Pct = (Marks_{\text{obt}} / Marks_{\text{total}}) \times 100 \quad (2)$$

XIII. ADMINISTRATIVE CONTROL

The admin module provides centralized management, allowing instructors to create quizzes/questions, assign marks, and monitor performance.

XIV. TESTING

System verification was conducted using functional test cases summarized in Table I.

TABLE I. TEST CASES AND SYSTEM VALIDATION

TEST CASE	EXPECTED RESULT
User registration	Account created successfully
User login	Valid user can access system
Quiz creation	New quiz stored in database
Quiz submission	Answers are recorded properly
Automatic eval.	Answers evaluated correctly
Score calculation	Correct score generated
Result display	Student can view result dashboard

XV. RESULTS AND DISCUSSION

The platform streamlines testing operations, eliminating physical paperwork and grading delays while enabling unified oversight.

XVI. ADVANTAGES

Automated evaluation; instant results; minimized workload; zero grading mistakes; centralized management; easy accessibility.

XVII. LIMITATIONS

Requires network connection; security must be strictly maintained; primarily tailored for objective question formats.

XVIII. FUTURE SCOPE

Timer support, randomized options, negative marking, performance analytics, leaderboards, mobile app support, and AI question generation.

XIX. CONCLUSION

The Online Quiz System automates assessment workflow, reduces instructor overhead, delivers instant results, and forms a scalable foundation for digital testing.

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