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Online Spot Examination System – The Future of Examination

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***Abstract*—** Spot Exam is a web-based application for organizing and conducting Objective and Coding examinations using the internet. The main goal of the Spot Exam is to make the process of examination fast, secure, paperless, and providing graphical analysis of results without any discrepancies. It also prevents a single user from giving multiple attempts. Spot Exam allows the students to resume the test from the same instant where they had left due to system/power failure. Spot Exam plays a key role in reducing the hectic of exam organization and conduction and increases confidentiality. It minimizes the paperwork and manual evaluation of the result. It also plays a key role in conducting remote examination as for distance education courses. The effort required to maintain and filter records of multiple users is reduced. It provides 100% accurate results removing the possibilities of any discrepancies in result evaluation or marking scheme. It allows for the automatic attendance of users. This resolves many problems of examination cell from creating and conducting the examination activities to a thorough evaluation of results by individual faculties. Spot Exam provides the freedom to create tests as per the convenience of the exam setter. The exam setter can also save the test as a draft and resume from the same point whenever he/she wants to. Spot Exam also provides features like reorganizing the test for the convenience of the exam setter.

***Keywords*—** Database, Java, Web Development, Web Server, Web Application.

I. INTRODUCTION

In today's world, the Examination method is shifting towards online as it is considered as an easy, fast, and secure method because of its reliability, speed, and accuracy. It also requires less manpower to organize and conduct examinations due to automatic evaluation and generation of results. Considering time as a major factor for conducting examinations, organizations are moving towards digital examination methods. It also allows for monitoring the progress of a student. This project helped us in gaining a lot of practical knowledge. According to modern-day requirements, spot examination helps the organizations to monitor their students and keep an eye on their progress.

Spot Examination transformed the manual process of creation and evaluation into a digitally automated process. One of the main aims of the Spot examination system is to effectively evaluate the student encyclopedic through a totally automated system that not only saves lots of time but also gives fast and accurate results along with the Graphical (pie Chart) representation.

Students can attempt tests from any location by means of the Internet, which helps the students to give the exam from far distances and also provides surety of protection and easiness and other beneficial features. Spot examination is more secure than other online examination sites by adding 2-D levels of security which is, adding the QR Validation before opening the test window as it assists the invigilator to authenticate and verify the student details. Scanning the QR code also marks the attendance/presence of students and makes the attendance process automated which in turn reduces the paper usage. Additional functionality of saving as the draft has also been provided to exam setter to save the question set before the final submit. Also, any test can be reorganized as many times as needed. An addon feature of webcam enables the organizer to have more control over remote examination by verifying candidate over webcam. Proposed system has frontend developed using HTML, CSS, and JavaScript[1]. Backend is developed using JSP, Servlet[2], with MYSQL[3] as a database.

II. RELATED WORK

Many different types of research have focused on the subject of an online examination system these works can be represented as follows:

1) SIETTE: - Guzman and Conejo (2005) proposed an online examination system called System of Intelligent Evaluation using Tests for Tele-education (SIETTE) [4]. SIETTE is a web-based environment to generate and construct adaptive tests. It can be used for instructional objectives, via combining adaptive student self-assessment test questions. SIETTE supports secure login and portability features. On the other hand, the other features: resumption capability, coding environment, test generation

by file upload, and random questions distribution are missing.

2) EMS: - Rashad Et. Al. (2010) proposed a web-based online examination system called Exam Management System (EMS) [5]. EMS manages the examination and auto-grading for students' exams and supports conducting exams, collects the answers, auto mark the submissions, and produce the reports for the test. EMS supports secure login. However, the other features: resumption capability, coding environment, test generation by file upload, and random questions distribution are missing.

3) CBTS: - Fagbola et. al. (2013) developed a Computer Based Test System (CBTS) [6]. CBTS is a web-based online examination system developed to address issues such as Lack of timing flexibility for automation candidates log-off upon expiration of allowed time, robustness, designed to support the examination processes and overcome challenges framing the conduct of examination, auto- marking, auto- submission, and auto-generation report of examination results. However, it lacked features like coding environment and test generation by file upload.

4) WETAS: - Henke (2007) proposed a web-based Test, Examination, and Assessment System (WETAS) [7]. WETAS is a web-based system designed for integration into existing Learning Management Systems (LMS); this system provides an examination environment and assignments as well to facilitate database supported e-Learning Test, suitable for the pre- and post-tests of Reusable Learning Objects (RLO) as well as the remote lab entry test. WETAS is implemented using Java Applet and PHP scripts for file handling. The Applet for Knowledge Testing in Laboratory Courses (AKTLC), in contribution with a task assembler, provides tasks from (a randomly selectable) text file and performs an evaluation of the student's result, furthermore WETAS built to make new types of tasks implemented perceptively by using simple and common available text editors. It is also possible to place additional graphics inside the text of the tasks. WETAS supports secure login. However, it lacks features like resumption capability, coding environment, test generation by file upload, and random questions distribution are missing.

5) SBPES: - Satav et. al. (2012) proposed a Structure Query Language (SQL) Based Paperless Examination System (SBPES) [8]. SBPES is a web-based system that can present a descriptive exam format for SQL and DML statements. This application requires presenting a highly maintainable, secure platform that provides high robustness, reliable, scalable, and updatable in order to acquire new features to improve user acceptability. SBPES supports secure login. However, it lacks features like resumption capability, coding environment, test generation by file upload, and random questions distribution are missing.

6) iEMS: - Vasupongayya et. al. (2010) proposed an interactive Examination Management System (iEMS)[9] . iEMS is a web-based application test management system, with ease of uses, rich features, flexibility, and extensibility. The iEMS supports secure login, portability, multi-instructor, random questions distribution, and random choices distribution features. However, it lacks features like resumption capability, coding environment and test generation by file upload are missing.

7) WONES: - Sheshadri et. al. (2011) proposed a web-based Online Non-choice-based Examination System (WONES) [10]. WONES is an effective solution for massive education evaluation; it employs special authentication protocols to ensure transactions between the examination server and the students. WONES supports secure login, portability, multi-instructor, and random question distribution features. However, it lacks features like resumption capability, coding environment and test generation by file upload are missing.

8) NOES: - Raj et.al. (2012) developed National Online Examination System (NOES) [11]. NOES can handle a huge number of students for administering questions on various subjects, and offers dynamic paper generation. Adobe Flex, Spring, and Hibernate frameworks are used for the development of the system. NOES supports secure login and portability features. However, it lacks features like resumption capability, coding environment, test generation by file upload, and random questions distribution are missing.

9) OESBC: - Islam et. al. (2013) proposed an Online Examination System in Bangladesh Context (OESBC) [12]. OESBC is a web-based, efficient, flexible, and adaptable. OESBC can provide an open mode of examination meeting the needs of various Academic and Non-Academic organizations. The examination contains different types of multiple-choice questions. The answers are checked and the marks obtained are stored in the database while the examiner can get the results immediately from the system in various forms such as the general mark list and ranking of participants. OESBC supports secure login, multi-instructor, random question selection, and portability features. However, it lacks features like resumption capability, coding environment, test generation by file upload, and random questions distribution are missing.

III. PROBLEM STATEMENT

1) In the existing solutions, the user is able to attempt the test from different id's which is considered as a big flaw in the placement process as in the first attempt, the user notes down all the questions and in the next attempt gets a good score and clears the test.
2) Not all the companies and colleges have their own test portal due to which companies or the colleges

conduct the test by paying for every student who appears for the test which is very expensive.

3) Some companies which have their own test portal still rely on creating the test manually which is a very hectic and time-consuming process.

IV. EXISTING SOLUTION

1) Almost all the existing solutions use a webcam for verification of the user but requires a webcam which is not available in college labs.
2) All existing solutions conduct tests on the behalf of the company or college and charge them on per student per test basis which makes the test conduction very costly.
3) Existing solutions do not allow college faculties to set up and conduct tests personally. Faculties have to contact the platform owner to set up tests on their behalf which makes the process very time consuming.
4) Some Existing solutions do not prevent users from attempting a test multiple time.
5) Existing solutions use a physical admit card for student verification which requires extensive use of paper.
6) Maintaining Attendance of students is done manually on paper.

V. PROPOSED SOLUTION

1) *Multiple attempt prevention:* This project uses a unique preassigned id associated with each user that may be an id assigned by the particular organisation and cannot be changed. This gives the candidate a unique identity.

2) *Secure and paperless:* This project uses digital means to conduct and organise a test and provides their a secure way of evaluation of results without any discrepancies.

3) *Complete control on tests conduction and management:* Teachers and faculties can set tests on own according to their convenience without requiring any other body to set tests on their behalf which maintains confidentiality and reduces overall test setup time.

4) *Reduced Verification Time:* QR Validation reduces user verification time to a few seconds and removes any discrepancies in identity of the user attempting the test. It cannot be bypassed by any means.

5) *No necessity of a physical admit card:* QR Validation removes the need of a physical admit card to verify student details.

6) *No time required in evaluation of result:* Result can be released at the instant of completion of test without wasting any time in evaluation of answer.

7) *Automatic Attendance Monitoring:* Attendance is maintained automatically with QR validation.

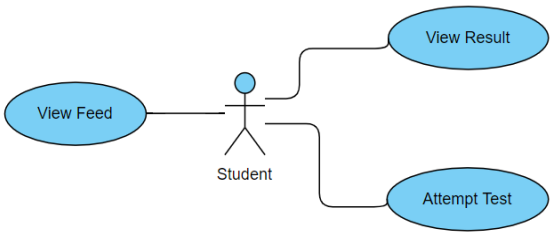

Fig 1: - Use Case Diagram of Student

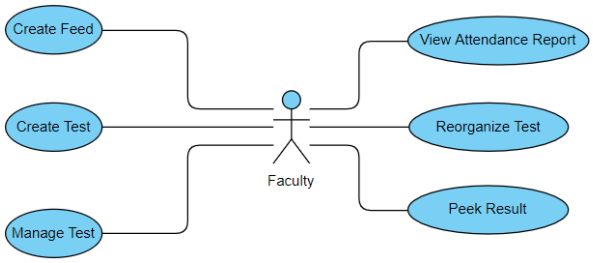

Fig 2: - Use Case Diagram of Faculty

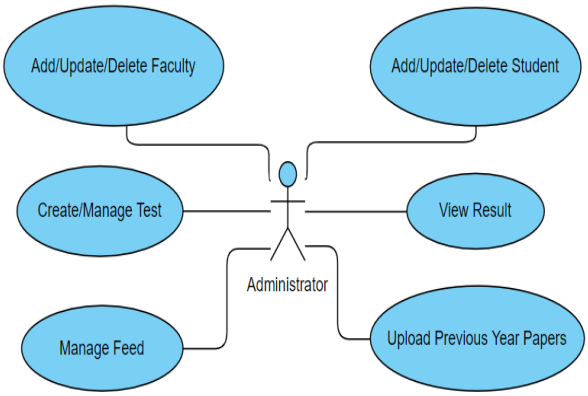

Fig 3: - Use Case Diagram of Administrator

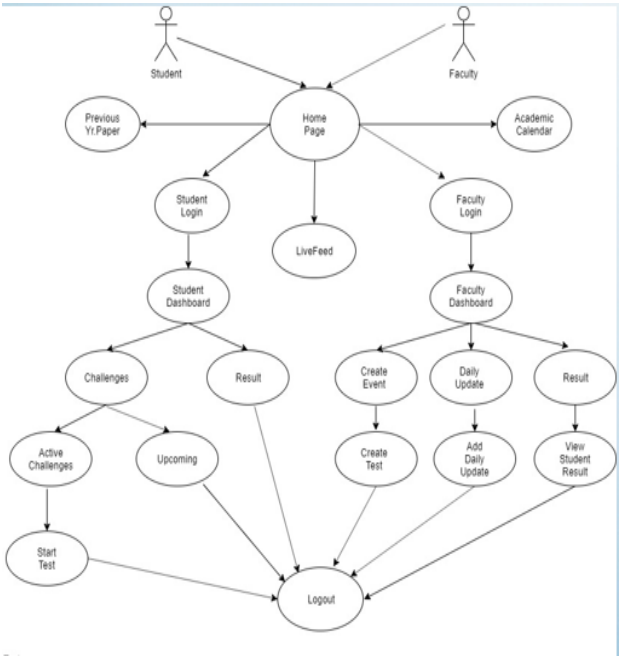

Fig 4: - UML Diagram of proposed System

VI. COMPARISON

Spot Examination	Other Examination Website
1) Before starting the exam, verification of students will be done by scanning the QR code.	1) No other website, give this facility for the verification of the student.
2) Login of student is done by their college id, so that only one student will be able to give the test at a time.	2) Other websites generate a unique id before conducting the exam which is time-consuming.
3) Exams can be created either manually or by uploading the file containing questions.	3) Generally, on other websites test creation is done manually.
4) We can use it either for colleges as well as for placement purposes due to its flexible nature.	4) It is generally made and used for placements only.
5) No such charges taken for tests every time.	5) They charge fees for conducting every test.
6) Attendance is maintained automatically.	6) Attendance has to be maintained manually.
7) Save as Draft option is available.	7) Save as Draft is not available.

VII. CONCLUSION AND FUTURE SCOPE

The main benefit of this project is reducing the evaluation time as well as manpower required for invigilating the result of each individual by automating the process. It also prevents a single user from giving multiple attempts and allows for proper authentication via dynamically created unique QR code for each user.

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