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Managing Conduction of Online Exams using Fullstack Technology

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***Abstract*— The project primarily focuses on taking up the online exam of the students and results will be generated automatically. The main aim is to reduce the paper consumption as well as the time of the authorities concerned to regulate the current examination system.**

The project walks through the student entering details and then takes the test using the test id and password given by their respective teachers. Once the test is submitted then the same student cannot give that again. And students can view the performance of their current as well as previous tests and then can logout any time.

The admin can modify or view the details of students, teachers, courses, etc. The admin can add new teachers, students, courses, etc. to the database as well.

The teachers can access their profile through the login and password that they created during signup. They can update their profiles as well and then logout once all has been done. They can create new tests, modify or delete tests with unique test id and password and even if they want to modify previously created tests, they can do it. The tests that can be created are mostly objective types with minimum one option to maximum four options for a particular question. They can also view all students' results in that particular test.

***Keywords*—exam systems, web application, online exam, database, web server**

I. INTRODUCTION

The purpose of **"Online Exam Management System"** is to make the examination system labour-saving, and time-efficient. This website reduces the manual work, maintaining accuracy, increasing efficiency and saving time. It will be helpful for both teacher and student. It will reduce the hectic job of students to write each answer manually. Also, it has automatic grading that will reduce the efforts of faculty.

- This site provides special functionality to users to give exams online rather than giving it for 24 or 48 hours and analysing that data simultaneously.
- The question paper will contain objective type questions (MCQs) which will be time saving.
- Evaluation will be done automatically
- Individual performance can be seen by student online.

The project's overarching goal is to transform the student test's current manual method into an online exam system. Particular Goal: The Online Examination System has the following specific goals: • This programme will correct

- Immediately display the outcome and put it in a database.
- The administrator has the option to add new examinations using this programme.
- The instructor can add questions to the test using this programme as well as modify questions for a specific exam.

- This programme handles administrator, teacher, and student authentication.

A. Background of Study

The use of the internet and computerised technology has increased across the board in education. Information technology plays a significant role in education nowadays. Thanks to technology and the internet, the educational system has experienced substantial change. Information technology makes it easier to deliver education anytime, anywhere, saving high-level educational institutions time and money. Print books are being replaced by online and offline applications. We have access to vast, informative databases thanks to computer software. This has a significant impact on education. Information technology has made information interchange swift and easy. The amount of information available to us has decreased due to modern technology. All economic sectors that use technology, including education, profit from it. The transaction was made faster, more accurate, and more efficient thanks to technological developments. As time goes on, computers become more and more useful for every transaction. With both students and instructors in mind, a programme called the Online Examination System for Introduction to Management was developed. The system supports students while they take exams. It is also useful for teachers to have access to a database where they can enter questions and answers and see who passed or failed an exam.

B. Problem in Current System

The current approach has a flaw since tests are still composed by students. It will take longer to do testing manually with this antiquated machinery. Students are not satisfied with the present multiple-choice exam format since it requires more time from lecturers to provide the question papers and answer sheets, as well as more time from students to complete their tests. Students who didn't use a 2B pencil were fined due to the inaccuracy of the existing approach. Exams administered manually consume more paper, which is detrimental to the environment at a time when it is so important to preserve it.

II. LITERATURE REVIEW

Computerised methods are becoming more common in classrooms today. Information technology is an essential component of education. Because of computers, the educational system has experienced a significant revolution. Information technology helps educational institutions save time and space while also making it simpler to provide educational services anywhere, at any time. For instance, everyone can access online libraries in place of physical ones, and students from around the world can connect with their teachers via video or live chat. We have access to vast, informative databases thanks to computer software. As a result, the educational system has been significantly altered. Information technology has made information interchange swift and easy.

Online libraries today include a wealth of material because of IT's progress. We don't need a real library to read books. We use computers as practical tools for all aspects of our education. Projects and ideas are created using multimedia technologies.

Students can learn remotely using information technology instead of in a typical classroom environment. On both an individual and institutional level, communications technology creates previously inconceivable potential for home-based learning, much of it part-time.

Students can perform a range of duties automatically rather than by hand, thanks to systems made feasible by information technology. Exams don't have to be administered on paper; students can use electronic systems instead. They save time and money when they employ a computer system for their instruction.

A. Example of Exam Systems

A.1 Infosolutions Goa

Universities may take advantage of their online testing platform. It is a PHP and MySQL-based web application. The exam is composed of multiple-choice questions from several categories. The questions are selected at random, but each topic is given the right amount of weight. The student's supplied response is stored in the database along with the evaluated responses and the grades given for each. The results are presented to the examiner all at once in a variety of formats, such as the general mark list and the comprehensive general mark list, which show each student's unique answer sheet in addition to the grades they earned for each topic in the subject. Both the total number of students who passed each subject and the number of students who passed each topic within a given subject are displayed on the trends graph. A trend graph can be used to compare the proportion of students who passed each topic on the midterm and final exams for a subject that includes two exams.

The programme keeps track of each student's data and provides users with the option to modify it if necessary. Access to individual answer sheets, general mark tables, and trend graphs is password-restricted. The password is encrypted (as an MD5 hash) and saved in the database, and sessions are used for authentication.

Any educational institution, including primary and secondary schools, colleges, professional and vocational institutions, universities, or training academies, can modify and adapt this online examination system in PHP and MySQL to meet their needs. This system is especially well suited for conducting competitive tests like recruitment examinations and Common Entrance Tests (CET) in several states since it would save a

significant amount of time spent analysing the answer books and results could be shown quickly.

A.2 iSummation Technologies

This company develops software for organising and designing personalised online tests. It is a fully automated web-based evaluation programme. Online registration and feature customization are available for students. They include built-in databases of exam questions, centralised administrator controls, randomly produced test questions, Obtain at any time and from any location. The exam format is easy to navigate and utilise; administrators enter the questions into the database. Exams are generated dynamically based on student selections. Exams and questions are always subject to modification, removal, and reuse. a forum where students may share information about their struggles and provide solutions to those problems.

B. Computerized Systems

Computers are becoming common place in our everyday lives as a result of how swiftly technology is developing. People use computers everywhere they go, including at work, school, and home. Computerised systems can process and store enormous volumes of data because of their efficiency.

Automated systems are essential since they reduce time and physical labour, according to Malolos et al. (2002). According to Janes (2001), computers are extraordinarily reliable and powerful devices. He lists three benefits of computers over traditional office supplies. Computers have these three benefits because of their efficiency, precision, and speed.

Reyes (2005) asserts that manual labour is time-consuming. However, the use of computers enhances the value of our work.

Computers are incredibly dependable and potent devices, in Janes' opinion (2001). He enumerates three advantages that computers have over conventional office supplies. These three advantages of computers can be attributed to their effectiveness, precision, and speed.
According to Reyes (2005), manual labour takes time. Computer use, however, raises the quality of our job.
According to Flores (2002), automation is the substitution of machine control for human control.
According to Dioso (2001), computers support intelligent planning, organising, and controlling.
According to Ralph M. Stair (1999), the advancement of technology has made it possible for people to do a variety of tasks effortlessly.

Gurewich (1999) asserts that database systems enable businesses to work more quickly. When employing computerised methods, everything is finished quicker than it would be if it were done by hand.
Mane (2000) said that executing the task manually was more difficult than using a machine. Computers are a necessity for everyone and are fantastic tools for productivity. Since the data is kept on the computer, users may access it whenever they need to.
According to Bryan (2006), a variety of individuals, procedures, and resources work together to gather, process, and distribute information inside an organisation. These systems range from simple manual ones to computer-based ones that employ communications, hardware, software, and other information technologies.

According to Sender (2002), computers are an intellectual amplifier that frees people to make sensible use of their time. Computers do tasks quickly and accurately.

Thowsand (2005) defined a database system as a collection of structured data. This data might relate to objects, people, or events.

The capacity to extract a lot of information from a little amount of data, their cost, their ability to regulate redundancy and preserve data independence, as well as their integrity and security, are among the benefits of databases, according to Adamski (2007).

C. Web-based Application

A web application is any programme that can be accessed by a web browser across a network, such as the Internet or an intranet.

Web applications are so well-liked, says Nijaz (2000), because it is feasible to update and maintain them without interfering with or installing software on the computers of millions of users. Similar to this, Bohle (2002) elaborated on how web applications have become successful due to their extensive use by clients.
The web has drastically changed computers and communication, claim Athanassopoulos et al. (2001).

According to Nijaz (2000) and Jurca (1999), the web is international and has the capacity to broadcast. Additionally, it is a platform that enables people to interact and cooperate regardless of their physical location, as well as a tool for information dissemination.
The primary force driving the enhancement of Web services is the creation of dynamic, user-friendly, and adaptable platforms.

D. Programming languages on World Wide Web

Enright (1999) said that the web, which has an estimated 36,739,000 hosts, 4,270,000 sites, and billions of records, is the world's largest information storage medium. Information, including photographs and textures, is available on the internet. We may design a fascinating user interface using

web programming languages like Hypertext Markup Language (HTML), Practical Extraction and Report Language (PERL), Java, JavaScript, and Virtual Reality Modelling Language (VRML). Hypertext Markup Language (HTML) is the most well-known and often-used computer language. It provides the syntax and positioning of certain directives that regulate how text, pictures, graphics, and video on a Web page are displayed on a browser, as well as hyperlink specifications. Since its inception, HTML has experienced several stages of evolution. The World Wide Web Consortium, the organisation in charge of establishing HTML standards, is based at the Massachusetts Institute of Technology. The first version of HTML created with the goal of presenting academic content online was version 1.0. In 1994, the HTML 2.0 specification, which includes more functionality including text fields, pop-up menus, and buttons, was created. The third edition of HTML 3.0 was released the following year. The most recent version of the language, HTML 5.0, is now quite popular. Regular text editors are used to build HTML. HTML is created and modified using a variety of programmes, such as Microsoft Front Page, Macromedia Dreamweaver, and Symantec Visual Page.

Being able to communicate with internet servers is an extremely useful talent. Common Gateway Interface (CGI) scripts are used for this. They are applications that the user launches as necessary to carry out predetermined duties. When a client clicks on components on the webpage, the scripts execute server-side tasks like searching and executing (Newton, 1998). One of the most popular and commonly used languages for creating CGI scripts is Practical Extraction and Report Language, or PERL. In 1986, PERL was established. According to Biedby (1997), PERL is robust and adaptable, comparable to high-level programming languages like C, and it is simple to learn.

User interaction and animated Web page components are supported over the internet. Many different computer languages, including Java from Sun Microsystems, may be used to generate these web components. Java is an object-oriented language that incorporates features of C, C++, and other languages as well as libraries for the online environment, claims Harold (1997). According to Harold (1997), the first programming language developed with networking in mind was Java. Important features like security and platform independence are available. It allows for the development of apps, which are subsequently published online for users to download whenever they're required. JavaScript is a computer language that works in conjunction with Java to create interactive, real-time-responsive applications.

Newton (1998) said that JavaScript is a Java alternative created to enhance web servers and webpages. JavaScript may be used to include standalone apps inside Java or HTHL applets. Ritchey (1996) asserts that JavaScript can make it possible to create user-responsive systems without a need for server-side software. The browser understands JavaScript when it is run. Additionally, 3-D graphics are shown online. This functionality is implemented using the Virtual Reality Modelling Language (VRML) modelling language. This language, which was created in 1995, can create a virtual world that is sensory-rich. VRML allows for the creation and online presentation of three-dimensional virtual buildings and vehicles.

Ames (1997) asserts that the inclusion of object motion, audio, video, and user interaction is made possible by the use of script in VRML.

III. METHODOLOGY

A. Research Methodology

Reading books and conducting preparatory research in the field to learn more about the online test method was one of the study's main duties. You may get all of the study materials online, among other places, on Wikipedia. The following phase involves reading, understanding, and assessing a literature review, as well as comparing the data gathered. This study focuses on online examination systems' usability, user friendliness, dependability, cost, and ability to satisfy target users' needs.

B. Project Activities

Software developers or a team of developers must use a development strategy that includes the process, techniques, and tools layers in addition to the general phases if they are to provide solutions to challenges in an industry. This tactic is frequently referred to as a process model or "paradigm of software development." The kind of project and application, the techniques and tools to be utilised, the necessary safeguards, and the deliverables are all taken into consideration when selecting a process model for software development. The entire process of developing software may be viewed as a multi-stage cycle of problem solving. All of the steps take place concurrently to some extent, regardless of the software project's process paradigm.

The waterfall model, a method, was used to construct this system. I chose this approach because I believed it would be the most successful for my project because it would move more quickly thanks to the several phases. The waterfall technique, which is frequently used as a development process, is favoured by many developers. The waterfall model method was chosen because it enables system development to be updated as each stage is complete. If some features are not done, it can be necessary to add or change them by going back to the earlier phases. The several stages of this paradigm include:

Project Planning
- Requirements Design
- Design
- Development
- Integration and testing
- Installation and acceptance

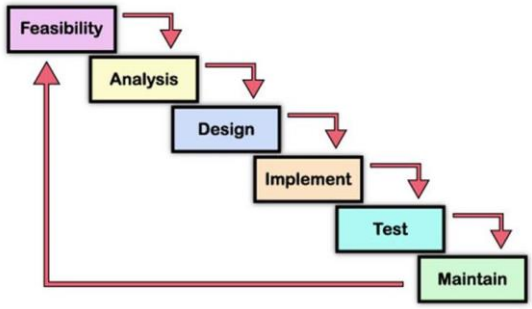

Figure: Waterfall Model

IV. CONCLUSION

Now that this project is over, I can say that its objectives were met. The concept as a whole allows teachers the option to add questions and solutions to the system while also giving students a foundation for taking exams online. The database contains the data, which was saved using the Java programming language. Online examinations perform better than paper exams for the introduction to management course. The automated technique saves time for teachers and students while streamlining the process. Response sheets would not be required, conserving space. The database has a secure, reliable system that is neither redundant nor inconsistent. It also has a user-friendly interface.

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