ONLINE EXAMINATION PORTAL USING FULL STACK DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SCHOOL OF COMPUTING

Submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Computer Science and Engineering By

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SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of YELURU HEMANTH

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DECLARATION

I, YELURU HEMANTH CHOWDARY (Reg:39111127), hereby declare that the project report entitled ONLINE EXAMINATION PORTAL USING FULL STACK done by meunder the

guidance of Dr.A.C. SANTHA SHEELA M.E., Ph.D., is submitted in partialfulfillment of the

requirements for the award of Bachelor of Engineering Degree in Computer Science and

Engineering.

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Heresth

SIGNATURE OF THE CANDIDATE

I am pleased to acknowledge my sincere thanks to Board of Managementof SATHYABAMA for their kind encouragement in doing this project and for

completing it

successfully. I am grateful to them.

I convey my thanks to Dr. T.Sasikala M.E., Ph. D., Dean, School of Computing,Dr. L. Lakshmanan M.E., Ph.D., Head of the Department of Computer Science andEngineering for providing me necessary support and details at the right time during the progressive reviews. I would like to express my sincere and deep sense of gratitude to my Project Guide Dr. A. C. Santha Sheela M.E., Ph.D., for her valuable guidance, suggestions and ^{constant} encouragement paved way for the successful completion of my phase- 2_{project work}.

ACKNOWLEDGEMENT

I wish to express my thanks to all Teaching and Non-teaching staff members of theDepartment of Computer Science and Engineering who were helpful in many ways for the completion of the project Online Examination System is a software solution, which allows a particular company

company or institute to arrange, conduct and manage examinations via an online environment. This can be done through the Internet, Intranet and/or Local Area Networkenvironments. The software is developed using programming language and database. In the software we can register as a user and users are of two categories which areLecturer and Student. Before using the system both users need to register and afterthat they must login with their username and password in orderto enter the system. The online examination system for introduction to management is constituted of different components for instance login function, insertion of data in the database, extraction of data from the database. The problem

with the current system is that students take their exam manually. This outdated system will take long timeutilization; the manual procedure used for conducting exam is time consuming process. More time being used for lecturers to bring the questions papers and answer sheets and also more time is needed for students in order to write their exam. ABSTARCT

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CHAPTER 1 Computerized and online systems have been increasing in every aspect of ^{education.} Information Technology plays a very important role in nowadayseducation. Computers and internet have made dramatic changes in the educationsystem. Information technology enables institution of high learning to save time_{and money}, and allow the delivery of education with easiness, anywhere, and ^{Paper based books} are replaced by online and off-line applications. With computersoftware, we can

be able to have access to huge databases of information. This gives fundamental change to the education. Information technology makes the exchanges of information fast and easily. In the modern era, technological progress has minimized the information in the world. Advancement of technologyhas many advantages in education and all business industries that use it. With theuse of the technology advances, the transaction became more rapid, accurate and efficient. As time goes by computers have become more useful for everytransaction. Online Examination System for introduction to management is anapplication that is designed and developed for students and lecturers. The systemhelps students to take examination. It helps also lecturers to upload the questions and answers in the database and they can see the students who fail or pass theexam. Digitalized internet platforms are increasingly being used in all areas of education, and it is clear that information technology is crucial in modern education. The educational system has undergone a complete transformation with the introduction of computers and the Internet. By utilizing information technology, universities can save both time and money while also making coursework moreaccessible and convenient for students. Digital apps, both online and offline, aregradually replacing traditional paper-based books. Computer software has made itpossible to access large informational resources, causing a paradigm shift ineducation. Technological advancements have numerous benefits for education and other sectors of the economy that utilize it. These advancements have INTRODUCTION

anytime.

accelerated and improved trading, making computers more suitable for all transactions over time. The Online Exam System Software called Managementwas designed with both instructors and students in mind. Students can use thissystem to help them during exams, while professors can track student progressand upload questions and answers to a database. The Online Examination Systemis a technology-driven solution that simplifies examination activities such asdefining exam patterns with question banks, setting exam timers, and creatingobjective/subjective question sections. This system allows exams to be conducted_{using a computer or mobile device in a paperless manner.} The Online Examination System is a cost-effective and scalable solution thatenables traditional pen and paper-based exams to be converted to an online andpaperless mode. Candidates can take the exam using any desktop, laptop, or mobile device with a browser, and objective type exam results can be generated

online exam is an excellent way to conduct exams and tests using the internet.Candidates can take the exam from home or a designated examination

^{centre,} using a device capable of accessing the internet. This system is particularly useful in a remote learning environment, where candidates can take exams from homewithout the need to travel. Online evaluation tests only require a microphone and webcam, and there is no need to invest in exam centres, security or invigilators. The Online Examination System can simplify overall examination managementand result in instant result generation. It is a complete agenda of an online-basedtest that offers multiple features and functionalities. The online examination systemuses online exam software to create, conduct, and evaluate tests, eliminating the dependency on paper for question and answer sheets and removing any manual workload that is present in offline tests. The entire process of a paper-based test isdigitized in the Online Examination System, from the beginning to the end, using_{online} assessment software^c. The problem with the current system is that students take their exam manually.This outdated system

will take long time utilization; the manual procedure used forconducting exam is time consuming process. More time being used forlecturers to bring the questions papers and answer sheets and also more time is needed forinstantly. 2 students in order to write their exam, student are not satisfy with the current system of taking the multiple choice examination. The no accuracy with current system when student did not use a 2b pencil studentare losing they are mark. Using the manual procedure of conducting examinationwe not saving the environment by using more paper, we are in the world wherereallyneed to take care of the environment.lecturers to bring the questions papersand answer sheets and also more time is needed for students in order to write their exam, student are not satisfy with the current system of taking the multiple choice examination. The no accuracy with current system when student did not use a 2b pencil studentare losing they are mark. Using the manual procedure of conducting examination we not saving the environment by using more paper, we are in the world where reallyneed to take care of the environment. This project is aimed at developing an online examination system for introduction to management for students and lecturers. The purpose of the system is to completely automate the old manual procedure of conducting exam to acomputerized System. I will provide a more efficient examination system. The system will allow students to register and take the exam. It enables also lecturers perform many tasks. The system has several functions. The users will do theregistration before using the system. The lecturers can upload questions and answers; he can view the list of

all students who take the exam. He can view the list of students who have grade A, grade B, grade C, grade D and those whofail the exam. The lecturers can send emails. Once logging, the students can choose the subject and take the exam. After finishing using the software the users have alogout function that allows them to sign out. This is because the system wants toensure no external users can exploit the system. One of the advantages of anonline examination portal is that it provides a detailed analysis of the student'sperformance. You can customise the exam to meet the needs of the studentsusing the online examination system. The online exam portal has revolutionised the outdated pattern of education and provided a multi-featured, user-friendly and flexible online platform with high reliability and cost-effectiveness. You can take the help of Gibbon to create an online exam portal for conducting exams with ease. It 3 allows no room for malpractices, provides privacy and security and assists you conducting exams. Instant result generation ensures transparency and in fairevaluation from you. Moreover, students will get their results confidentially, unlike the traditional exams where teachers announce the student's results openly. Asecure online exam portal safeguards the student's identity. The digital counterparts of the exam allow you to conduct an online proctored exam which they can answer from their home at their comfort. The ultimate benefit of implementing the online examination system is thereduction of costs and time. Students can save a lot of their time with anautomated online assessment platform. They need not attend school or collegeto take the exam. Students from remote locations can take an online proctoredexam using an electronic device. Also, there will be faster access

to the exam in_{online} mode as they need not fill out so much information as in the traditional exams. The data of students will be recorded automatically in the onlineexamination system. So, students will get more time to understand the questions.From your point of view, you can relieve yourself from the efforts of creation,distribution and evaluation of the test. The online examination system removes the expensive process. You need not check the test paper because students will get instant feedback after the exam. You can take advantage of the autogradedsystem available on the online test portal. You need not worry about the logistics as no travel is essential.

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CHAPTER 2 LITERATURE SURVEY

Author Luchet , with his title "A systematic Analysis of Study in the year 2019^{focuses} his research on online testing in terms of the challenges that may beencountered. Among the challenges mentioned was the problem of identifyingstudents who use the system as well as security risks, skills in answering different_{questions} among students, problems in maintenance and evaluation. Author Jasso, with his title "E-learning" in the year 2019 studied on e-learningin courses at the University of Perugia, known as e-studium. The study consisted of two stages, through student's application for online tests or tests that are madedirectly to students. The study took two years with four semester examinations tograduate students in computer science. Their study focused on the effectiveness_{of the} system used to students.

Mode" in the year 2017adapted the online examination system using a mode known as "B/W Mode". Webserver was used to control the tests and provide information to students. The maingoal of the study is to reduce the use of paper and develop a test system that issafe to use. Among the features utilized was only allow the system to be used after receiving the application from student to use it. Ria Mae, with the title "Academics through online" in the year 2019 studied aboutan online examination system that can be administered manually or automaticallyby lecturers. Lecturers can send questions via the web and studentswill answerand send their answers online via the Internet. By using this online examination system, grading process can be done automatically. Researcher has conducted a survey about the form and type of examination questions that will be included in the online examination system. Author Hauang Darong with the titel Elearning in the year 2020b studied the online examination system which has combined Struts2, Spring and Hibernate.

Selections to review the combined results are based on an important function ⁱⁿthe online examination is online fields was completed, in addition the framework ^{S2SH} (Struts2 + Spring +Hibernate) have been adopted in this system byseparating multiple levels of control such as, the level views, the level of control, the level of business logic and level of data access into different components. ^{According to Huang} Darong (2010), an online examination system will also use theMVC (Model_View_Controller) pattern in the development stage of web system toachieve loose coupling between stages. The database for this system has

been equipped with d eleminating system that will increase the strength of the safetycontrol system together with authentication Login technology and power role. Theresults of this study, the framework Struts2 + Spring + Hibernater may be applied in theonline examination system. Struts2. From the above research works, it is clear that Remote examination and proctoringare significantly gaining importance in the wake of the accommodation of comfort, security, and accessibility. This will not just increase the importance of course or remote-based examinations but it also helps in MOOCs (mass open online courses) and other credit-based certifications for the concern of establishing An essential step for achieving this. Before creating the tools and their blueprint, it is important to identify and examine factors such as temporal constraints, resource requirements, personnel, financial, and corporate capabilities. The next phase involves determining the specific framework and requirements of the program, which includes the selection of the necessary operating system and software components. Once the required materials are understood and appreciated, the corresponding tools and processes can be created. From the above-mentioned literature works, it is clear that there has been effective research on my doctor appointmentapplications and many models have been proposed. It is evident that the above mentioned systems have their own pros and cons. While some of the recent works involve hybrid technologies and provide better accuracy, they are still far from what is needed In a study conducted by Edwardscredibility.

et al (2017) it was seen that women were almost twice as likely to perform an e

The consultation as men (64.7% vs. 35.3%) and over half of all users were age 25–44 proposed online examination software the monitoring system uses advanced, secure, and reliable Artificial Intelligence to monitor the students and review the examination. Web-based automated examination system which detects all unusual activities and flags them, to ensure fair proposition of exams. The target sample of this study is to involve undergraduate students from the social sciences and applied sciences. The target is of at least 6 from 20 public universities in thecountry. Estimated sample are at least 400 students. The instrument used ^{is} questionnaire using nominal data. This study uses a simple random sampling. Technology Stack Full-stack development is a popular approach for developingonline portals. This approach involves using a combination of frontend and back end technologies to create a robust, scalable, and responsive

application. Studiessuggest that a combination of ReactJS for the front-end and

NodeJS for the back end can be an effective technology stack for online portals. years.

The advantages of online examination conducted are more flexible in carryingoutthe examination to students and consistent in the scoring aspect. By using theonline examination, students are not necessarily bound by the constraints of thestudy schedule. In particular, the student can take the online examination at different locations at a predetermined time and has a time limit that has beenprovided.

2.1 INFERENCES FROM LITERATURE SURVEY: Based on a literature survey, some possible inferences for an online examination portal using full stack are: The user experience is a critical factor in the success of an online examinationportal. Therefore, it is essential to focus on creating a user-friendly interface that iseasy to navigate and understand. Studies suggest that users prefer portals with clear instructions, intuitive design, and a consistent layout. Security Online examination portals must ensure the security and integrity of theexam content and user data. Security measures such as encryption, secure authentication, and access control mechanisms must be implemented to prevent cheating and unauthorized access to sensitive information. The performance of the portal is another essential factor that affects the userexperience. The portal must be fast, responsive, and able to handle a largenumber of concurrent users. Studies suggest that users have a low tolerance for slow-loading pages or errors in the portal. Technology Stack Full-stack development is a popular approach for developingonline portals. This approach

involves using a combination of front-end and back end technologies to create a robust, scalable, and responsive application. Studiessuggest that a combination of ReactJS for the front-end and NodeJS for the back end can be an effective

technology stack for online portals. Integration with Learning Management Systems Online examination portals can be integrated with learning management systems

(LMS) to provide a seamless_{learning} experience. The integration can help in managing course content, tracking ^{student} progress, and providing feedback on student performance. Studiessuggest that integration with an LMS can enhance the effectiveness of online_{examination} portals. Accessibility Online examination portals must be accessible to users withdisabilities. Accessibility features such as text-to-speech, keyboard navigation, andhigh contrast mode must be included to ensure that all users can access the portal. Studies suggest that accessibility is an important factor in improving the user

experience for users with disabilities. Overall, these inferences suggest that the design and development of an examination portal using full stack must prioritize user experience, online

security, performance, technology stack, integration with LMS, and accessibility. Full stack development is a popular approach for building online examinationportals.

It involves using a single team of developers to work on both the front-endand

back-end aspects of the portal, which allows for more efficient and streamlined Scalability and flexibility One of the main advantages of using full stackdevelopment for an online examination portal is that it allows for scalability andflexibility. This means that the portal can be easily adapted to meet the changing_{needs} of users, and can be scaled up or down as required.development.

⁹ 2.2 OPEN PROBLEMS IN EXISTING SYSTEM : Based on the existing systems for online examination portals using full stack,

here are some open problems that can be addressed: Security: Although full stack development can help to ensure security, onlineexamination portals are still vulnerable to various security threats such as hacking,phishing, and data breaches. There is a need to constantly update and improve the security measures in place to prevent such threats. Reliability: Online examination portals need to be reliable and available at all times, especially during peak periods such as exam season. There is a need to ensure that the portal can handle high traffic volumes and is resilient to failures or Cheating prevention: One of the biggest challenges of online exams is preventingcheating. Although measures such as proctoring and

plagiarism detection softwarecan help, there is a need to explore other innovative ways to prevent cheating, such as using blockchain technology or machine learning algorithms. Accessibility: Online examination portals need to be accessible to all users, including those with disabilities. There is a need to ensure that the portal

is compliant with accessibility standards and can be used by users with

assistive Performance: Online examination portals need to perform well, with fast loadingtimes and smooth user experience. There is a need to constantly monitor

and optimize the performance of the portal to ensure that it meets the expectations of Data management: Online examination portals generate a lot of data, such as testresults and user information. There is a need to ensure that this data is properly managed, stored securely, and is compliant with data protection regulations.

downtime.

Integration with other systems: Online examination portals often need to integrate with other systems, such as learning management systems and student systems. There is a need to ensure that these integrations are seamless and that data is transferred securely between systems. technologies.

users.

10 Addressing these open problems can help to improve the overall quality and effectiveness of online examination portals using full stack, and provide a better user experience for students and educators alike. The whole process of assigning test and evaluating their scores after the test, wasdone manually till date. Processing the test paper i.e. checking and distributingrespective scores used to take time when the software was not Installed. The current system is very time consuming. It is very difficult to analyze the exam manually. To take exam of more candidates more invigilators are required Resultsare not precise as calculation and evaluations are done. The chances of paper leakage are more in current system as compared Resultprocessing takes more time as it is done manuall The entire process of testassignment and post test scoring has been manual up to this point .Processing oftest documents, i. H. Validation and distribution of relevant results when thesoftware is not installed The current system will last a Multiple examiners are required long time Analyzing trials manually is very difficult. to administer exams for multiple candidatesCalculations and estimates were made and the results are not exact. With currentsystems, it takes a lot of time to

manually process the results, which increases the chances of losing paper.

CHAPTER 3 REQUIREMENT ANANLYSIS3.1 FEASIBILITY STUDIES/RISK ANALYSIS

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OF THE PROJECT: Technical Feasibility

Building this system is technically feasible. The hardware and software neededare all available, it not difficult to get them. Brief I can say the necessary resourcesneeded for the development and maintenance of the system are available. I am going to use java programming languages and database. A feasibility study is an assessment of the practicality of a proposed plan orproject. A feasibility study analyzes the viability of a project to determine whether the project or venture is likely to succeed. The study is also designed to identify potential issues and problems that could arise while pursuing the project. Operationally Feasibility The project I am developing is operationally feasible as there is no need for usersto have good knowledge in computer before using it. The user can learn and use the system with easiness; he just needs to read the manual or tutorial from Besides being technically feasible, developing this system is economically feasibleas well. The development of the system does not require the developers to spend a lot of money. Social Feasibility

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. Theuser must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods

that are employed to educate the user about the system and to make him familiar with it.developers.

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3.2 SOFTWARE REQUIREMENTS SPECIFICATION DOCUMENT: SOFTWARE TOOLS USED:

The tools required to develop the system are: Net Beans IDE 67.2,

Microsoft Access 2007, MySQL in XAMPP, HTML, CSS, JAVA SCRIPT. IDE 7.2 The NetBeans IDE is a free and open source software development tool that allow developers to create enterprise, web, desktop, and mobile applications. The NetBeans IDE 7.2 is an Integrated Development Environment available forWindows, Mac, Linux, and Solaris. The NetBeans project consists of an open source IDE and an application platform which enable me to rapidly create thesoftware using Java programming language. NetBeans IDE offers first-class toolsfor Java web, enterprise, desktop, and mobile application development. It isconsistently the first IDE to support the latest versions of the JDK, Java EE, andJavaFX. It provides smart overviews to help you understand and manage yourapplications, including ouf-of-the-box support for popular technologies such asMaven. With its end-to-end application development features, constantly improvingJava Editor, and continual speed and performance enhancements, NetBeans IDEsets the standard for application development with cutting edge technologies out of the box. All the functions of the IDE are provided by modules. Each moduleprovides a well-defined function, such as support for the Java language, editing, orsupport for the CVS versioning system, and SVN, NetBeans contains all themodules needed for Java development in a single download,

allowing the user tostart working immediately. Modules also allow NetBeans to be extended. Newfeatures, such as support for other programming languages, can be added byinstalling additional modules. For instance, Sun Studio, Sun Java StudioEnterprise, and Sun Java Studio Creator from Sun Microsystems are all based on the NetBeans IDE. NetBeans

Microsoft Project:

Microsoft Project is a project management software program, developed byMicrosoft, which is designed to assist a project manager in developing ^aplan, assigning resources to tasks, tracking progress, managing the budget and analyzing workloads. 14 The application creates critical path schedules, and critical chain and event chain methodology third-party add-ons also areavailable. Schedules can be resource leveled, and chains are visualized in aGantt chart. Additionally, MS Project can recognize different classes of users. These different classes of users can have differing access levels to projects, views, and other data. Custom objects such as calendars, views, tables, filters, and fields are stored in an enterprise global which is shared by all I use it to plan and manage the time more efficiently. Though MS Project ^{Online is} a cloud-based solution, it has several disadvantages. Even withSharepoint, which is designed to take advantage of the cloud, MS Project hasgreat limitations on the cloud. It's difficult to learn and use. There's a lot of timeand effort, and even intensive training, that must first be invested in the softwarebefore project managers and their teams are comfortable using the software. Thisadds time to the project during the implementation stage.It's expensive. The pricesquoted above, again, are per person, per month. This quickly adds up as you buylicenses for team members who require access to the software in order to take advantage of its collaborative features. Otherwise, it's more of an expensive tool solely for the project manager.It's noteasily shareable. As mentioned earlier, files are saved in an MPP, a proprietaryformat, so that if you're not using MS Project, you can't read those files. This wouldbe less of a problem if the software was less expensive, but if you must have anMS Project license to view an MPP file, then it adds up. This creates a lot of unnecessary hurdles when sharing project files users.

MySQL is an open source RDBMS that relies on SQL for processing the datain the database. MySQL provides APIs for the languages C, C++, Eiffel, Java,Perl, PHP and Python. In addition, OLE DB and ODBC providers exist forMySQL data connection in the Microsoft environment. A MySQL .NET NativeProvider is also available, which allows native MySQL to .NET access without the need for OLE DB.MySQL:

¹⁴ MySQL is most commonly used for Web applications and for embeddedapplications and has become a popular alternative to proprietary databasesystems because of its speed and reliability. MySQL can run on

UNIX, Windows and Mac OS. MySQL is developed, supported and marketed byMySQL AB. The database is available for free under the terms of the GNUGeneral Public License (GPL) or for a fee to those who do not wish to be bound by the terms of the GPL. MySQL is currently the most popular database management system software usedfor managing the relational database. It is open-source database software, which is supported by Oracle Company. It is fast, scalable, and easy to use databasemanagement system in comparison with Microsoft SQL Server and OracleDatabase. It is commonly used in conjunction with PHP scripts for creatingpowerful and dynamic server-side or web-based enterprise applications. It is developed, marketed, and supported by MySQL AB, a Swedish company, and written in C programming language and C++ programming language. The official pronunciation of MySQL is not the My Sequel; it is My Ess Que Ell. However, you can pronounce it in your way. Many small and big companies use MvSQL. MySQL supports many Operating Systems like Windows, Linux, MacOS, etc. withC, C++, and Java languages. MySQL is a Relational Database Management System (RDBMS) software that provides many things, which are as follows: It allows us to implement database operations on tables, rows, columns, and indexes. It defines the database relationship in the form of tables (collection of rows and columns), also known as relations. It provides the Referential Integrity between rows or columns of various tables. It allows us to updates the table indexes automatically. It uses many SQL queries and combines useful information from multiple tables

for the end-users. MySQL follows the working of Client-Server Architecture. This

model is designed for the end-users called clients to access the resources from a central computer known as a server using network services. Here, the clients make requests

¹⁵ through a graphical user interface (GUI), and the server will give the desired outputas soon as the instructions are matched. The process of MySQL environment is the same as the client-server model. The core of the MySQL database is theMySQL Server. This server is available as a separate program and responsible forhandling all the database instructions, statements, or commands. The working of MySQL database with MySQL Server are as follows: MySQL creates a database that allows you to build many tables to store and manipulate data and defining the relationship between each table. Clients make

requests through the GUI screen or command prompt by using_{specific SQL} expressions on MySQL. Finally, the server application will respond with the requested expressions and_{produce the desired result on the client-side.} A client can use any MySQL GUI. But, it is making sure that your GUI should belighter and user-friendly to make your data management activities faster andeasier. Some of the most widely used MySQL GUIs are MySQL Workbench,SequelPro, DBVisualizer, and the Navicat DB Admin Tool. Some GUIs arecommercial, while some are free with limited functionality, and some are onlycompatible with MacOS. Thus, you can choose the GUI according to your needs._{Reasons for} popularity ^{MySQL} is becoming so popular because of these following reasons: MySQL is an_{open}-source database, so you don't have to pay a single penny to use it.

MySQL is a very powerful program that can handle a large set of functionality MySQL is customization of the most expensive and powerful database packages. because it is an open-source database, and the open source GPL license facilitates programmers to modify the SQL software according to their own specific environment. MySQL is quicker than other databases, so it can work well even with the largedata set. MySQL supports many operating systems with many languages like PHP, PERL, C, C++, JAVA, etc. MySQL uses a standard form of t known .SQL .MySQL 16 MySQL supports large databases, up to 50 million rows or more in a table. Thedefault file size limit for a table is 4GB, but you can increase this (if your operating system can handle it) to a theoretical limit of 8 million terabytes (TB). The projectof MySQL was started in 1979 when MySQL's inventor Michael Widenius developed an in-house database tool called UNIREGfor managing databases. After that. UNIREG has been rewritten in several different languagesand extended to handle big databases. After some time, Michael Widenius contacted David Hughes, the author of mSQL, to see if Hughes would beinterested in connecting mSQL to UNIREG's B+ ISAM handler to provide indexing to mSQL. That's the way MySQL came into existence. The HyperText Markup Language, or HTML is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript.HTML tutorial or HTML 5 tutorial provides basic and advanced concepts of HTML. Our HTML tutorial is developed for beginners

andprofessionals. In our tutorial, every topic is given step-by-step so that you canlearn it in a very easy way. If you are new in learning HTML, then you can learnHTML from basic to a professional level and after learning HTML with CSS and JavaScript you will be able to create your own interactive and dynamic website. But Now We will focus on HTML only in this tutorial.Web browsers receive HTMLdocuments from a web server or from local storage and render the documents intomultimedia web pages. HTML describes the structure of a web page semanticallyand originally included cues for the appearance of the document.HTML elementsare the building blocks of HTML pages. With HTML constructs, images and otherobjects such as interactive forms may be embedded into the rendered page._{HTML} provides a means to create structured documents by denoting structural HTML:

semantics for text such as headings, paragraphs, lists, links, quotes and otheritems. HTML elements are delineated by tags, written using angle brackets. Tagssuch as and <input /> directly introduce content into the page. Other tagssuch as surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags, but use them to interpret the content of the page.HTML can embed programs writtenin a scripting language such as JavaScript, which affects the behavior and content_{of} web pages. Inclusion of CSS defines the look and layout of content. World Wide Web Consortium (W3C), former maintainer of the HTML andcurrent maintainer of the CSS standards, has encouraged the use of CSS overexplicit presentational HTML since 1997. HyperText simply means "Text withinText." A

text has a link within it, is a hypertext. Whenever you click on a link whichbrings you to a new webpage, you have clicked on a hypertext. HyperText is a wayto link two or more web pages (HTML documents) with each other.Markuplanguage A markup language is a computer language that is used to apply layout and formatting conventions to a text document. Markup language makes text moreinteractive and dynamic. It can turn text into images, tables, links, etc.Web Page: Aweb page is a document which is commonly written in HTML and translated by aweb browser. A web page can be identified by entering an URL. A Web page canbe of the static or dynamic type. With the help of HTML only, we can create staticweb pages. Hence, HTML is a markup language which is used for creatingattractive web pages with the help of styling, and which looks in a nice format on a web browser. An HTML document is made of many HTML tag. Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSS is acornerstone technology of the World Wide Web, alongside HTML and JavaScript.CSS is designed to enable the separation of presentation and content, includinglayout, colors, and fonts. This separation can improve content accessibility, providemore flexibility and control in the specification of presentation characteristics.enable multiple web pages to share formatting by specifying the relevant CSS in aseparate .css file which reduces complexity and repetition in the structural contentas well as enabling the .css file to be cached to improve the page load speedbetween the pages that share the file and its formatting. Separation of formattingand content also makes it feasible to present the same markup page in different styles for different rendering methods, such as on-screen, in print, by voice (via speech-based browser or screen reader), and on Braille-based tactile devices.CSS:

CSS also has rules for alternate formatting if the content is accessed on a device. The name cascading comes from the specified priority scheme mobile todetermine which style rule applies if more than one rule matches a particularelement. This cascading priority scheme is predictable. The CSS specifications re maintained by the World Wide Web Consortium (W3C). Internet media type(MIME type) text/css is registered for use with CSS by RFC 2318 (March 1998). The W3C operates a free CSS validation service for CSS documents. In addition to HTML, other markup languages support the use of CSS includingXHTML, plain XML, SVG, and XUL. It is a style sheet language which is used to describe he look and formatting of a document written in markup language. It provides an additional feature to HTML. It is generally used with HTML to change the style of web pages and user interfaces. It can also be used with any kind of XML documents including plain XML, SVG and XUL.CSS is used along with HTML and JavaScript in most websites to create user interfaces for web applications and user interfaces for many mobile applications. Before CSS, tags like font, color, background style, elementalignments, border and size had to be repeated on every web page. This was avery long process. For example: If you are developing a large website where fontsand color information are added on every single page, it will be become a long and expensive process. CSS, also known as Cascading Style Sheets, is a languagewith a simple design that aims to simplify the task of making web pages visually appealing. With CSS, you can add styles to web pages and, more importantly, doso independently of the HTML code that makes up each page. This languaged fines the appearance of a webpage, including colors, fonts, spacing, and manyother elements, allowing you

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to customize your site's look to your liking. Developers and designers can use CSS to determine how elements behave, such as their position in the browser. Unlike HTML, which uses tags, CSS uses rulesets. Although CSS is easy to learnand comprehend, it provides powerful control over the presentation of an HTMLdocument. CSS saves time: You can write CSS once and reuse the same sheetin multiple HTML pages. Easy Maintenance: To make a global change simplychange the style, and all elements in all the webpages will be updated automatically.Search Engines: CSS is considered a clean coding technique, 19 which means search engines won't have to struggle to "read" its content.Superiorstyles to HTML: CSS has a much wider array of attributes than HTML, so you can give a far better look to your HTML page in comparison to HTML attribute. JAVA SCRIPT: JavaScript often abbreviated as JS, is a programming language that conforms to the ECMAScript specification. JavaScript is high-level, often just-in-time compiledand multi-paradigm. It has dynamic typing, prototype-based objectorientation and first-class functions. Alongside HTML and CSS, JavaScript is one of the coretechnologies of the World Wide Web.Over 97% of websites use it client-side forweb page behavior, often incorporating third-party libraries. All major web browsers have adedicated JavaScript engine to execute the code on the user's device. As a multi-paradigm language, JavaScript supports event-driven, functional, and imperative programming styles. It has application programming interfaces (APIs) for working with text, dates, regular expressions, standard data structures, and theDocument Object Model (DOM). The ECMA Script standard

does not include anyinput/output (I/O), such as networking, storage, or graphics facilities. In practice, the web browser or other runtime system provides JavaScript APIs for I/O.JavaScript engines were originally used only in web browsers, but they are nowcore components of some servers and a variety of applications. The most popularruntime system for this usage is Node.js. Although there are similarities betweenJavaScript and Java, including language name, syntax, and respective standardlibraries, the two languages are distinct and differ greatly in design. Js, also knownas JavaScript, is a nimble programming language that follows an object-oriented approach. It is utilized by multiple websites for scripting their webpages. This interpreted programming language is full-featured and enables dynamic interactivity on HTML documents. Netscape Navigator browser introduced it in 1995 for integrating programs intowebpages. Since then, all other graphical web browsers have incorporated it.JavaScript empowers users to create contemporary web applications that interact directly without having to reload the page every time. Js is used in traditional websites to provide various types of interactivity and ease.JavaScript is backed by all commonly used internet browsers as they come equipped with integrated 20 execution environments. The language's syntax and structure are modeled afterthose of the C programming language, rendering it a structured programminglanguage. JavaScript is categorized as a weakly typed language, signifying that certain types are subject to implicit casting based on the operation at hand. The language is object-oriented, utilizing prototypes instead of classes for inheritance. It is both lightweight and interpreted, and is also case-sensitive.

JavaScript is compatible with numerous operating systems, such as Windows andmacOS. It also grants users significant control over their internetbrowsers. JavaScript is used to create interactive websites. It is mainly used for: Client-side validation, Dynamic drop-down menus, Displaying date and time, Displaying pop-up windows and dialog boxes (like an alert dialog box, confirmdialog box and prompt dialog box), Displaying clocks etc. In 1993, Mosaic, the firstpopular web browser, came into existence. In the year 1994, Netscape wasfounded by Marc Andreessen. He realized that the web needed to become moredynamic. Thus, a 'glue language' was believed to be provided to HTML to make web designing easy for designers and part-time programmers. Consequently, in1995, the company recruited Brendan Eich intending to implement and embedScheme programming language to the browser. But, before Brendan could start, the company merged with Sun Microsystems for adding Java into its Navigator sothat it could compete with Microsoft over the web technologies and platforms.Now, two languages were there: Java and the scripting language. Further, Netscape decided to give a similar name to the scripting language as Java's. It ledto 'Javascript'. Finally, in May 1995, Marc Andreessen coined the first code of Javascript named 'Mocha'. Later, the marketing team replaced the name with'Live-Script'. But, due to trademark reasons and certain other reasons, inDecember 1995, the language was finally renamed to 'JavaScript'. From then, JavaScript came into existence. The programming language known as JavaScriptor JS has APIs that are specifically designed for handling text, dates, regular expressions, standard
data structures, and the Document Object Model (DOM). However, the ECMA

Script standard does not provide any input/output (I/O)functionalities such as

networking, storage, or graphics. In order to work with I/O,JavaScript APIs

provided by web browsers or other runtime systems must be utilized. JavaScript

engines were initially only used in web browsers, but today

²¹ they are used as core components of a variety of applications and even someservers. The most commonly used runtime system for this purpose is Node.js.Despite the shared name and some similarities in syntax and standard libraries,JavaScript and Java are distinct languages that differ greatly in design. JavaScriptis an agile, object-oriented programming language that is often used for scriptingweb pages on numerous websites. This interpreted programming language is highly functional and allows for dynamic interactivity on HTML documents.

3.3 SYSTEM USE CASE : A use case diagram in the Unified Modeling Language (UML) is a type

^{of}behavioral diagram defined by and created from a Use-case analysis. ^{Its purpose is} to present a graphical overview of the functionality provided by asystem in terms of actors, their goals (represented as use cases), and any_{dependencies} between those use cases. Use-case diagrams describe the high-level functions and scope of a system.These diagrams also identify the interactions between the system

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and its actors. The use cases and actors in use-case diagrams describe what the system does and how the actors use it, but not how the system operates internally. The main purpose of a use case diagram is to show what system functions

^{are}performed for which actor. Roles of the actors in the system can be depicted. ^{The} unified modeling language used is use case diagram. A use case is a setof scenarios that



describes an interaction between a user and a system. A_{use case diagram} displays the relationship among actors and use casesFig:3.1: Use Case Diagram CHAPTER 4 DESCRIPTION OF PROPOSED SYSTEM The proposed system for an online examination portal using

full stack will be $_{\mbox{designed to address the open problems identified in}$

the existing systems. Thesystem will be developed using a full stack approach,

with a focus on security, reliability, cheating prevention, accessibility,

performance, data management, and integration with other systems. The system will have a user-friendly interface that allows students to register forexams, view their exam schedules, and take exams online. Educators will be ableto create exams, manage exam schedules, and review exam results. The system will also provide various features such as proctoring, plagiarism detection, and time management to prevent cheating and ensure the integrity of exams. The technology stack used for the proposed system will include HTML, CSS, JavaScript, Node. js, Angular, React, and MongoDB. These technologies will allowfor the creation of a responsive design that adapts to different screen sizes and devices, and provide a scalable and flexible platform that can be easily adapted to meet the changing needs of users. To ensure security, the proposed system will incorporate various securitymeasures at both the front-end and back-end levels, such as encryption, firewalls, and access control. The system will also be regularly updated and tested to ensure that it is secure against emerging threats. To ensure reliability, the proposed system will be designed with high availability and fault tolerance in mind, with redundant servers and backup systems in place to ensure that the portal remains available at all times. To ensure accessibility, the proposed system will be compliant with accessibilitystandards, with features such as screen readers and keyboard navigation to enable users with disabilities to take exams online. To ensure performance, the proposed system will be optimized for fast loading 24 times and smooth user experience, with features such as caching and content delivery networks to improve performance. To ensure data management, the

proposed system will have a robust datamanagement system in place, with data stored securely and in compliance with data protection regulations. Finally, to ensure integration with other systems, the proposed system will useAPIs and other integration tools to enable seamless data transfer between theonline examination portal and other systems such as learning management systems and student information systems. The online test created for taking online test has following features In comparison to the present system the proposed system will be less time consuming and ismore efficient. Analysis will be very easy in proposed system as it is automatedResult will be very precise and accurate and will be declared in very short span of time because calculation and evaluations are done by the Simulator itself. The proposed system is very secure as no chances of leakage of question paper as it is dependent on the administrator only. The logs of appeared candidates and their marks are stored and can be backupfor future use An online test designed for conducting online tests has the followingcharacteristics: In the proposed system, the analysis becomes very easy due toits automation. The calculations and evaluations are done by the simulator itself, so the results are very accurate, precise and explained in a very short time. The proposed system is very secure as there is no possibility of survey leak as it onlyrelies on the administrator A record of the candidates that have appeared and their votes is saved and can be saved for future use. Overall, the proposed system for an online examination portal using full stack will provide a secure, reliable, accessible, and performant platform that meets the needs of students, educators,

and administrators alike. Going environment-friendly in conducting exams is essential in today's world as_{pollution} and environmental degradation is happening rapidly. The educational ^{institutions} are going digital in their exams to contribute to the environment by_{avoiding} paper use for assessment. It is also in line with the

inexpensive device for

the examination management system. Also, you need not print question papersthat go to waste after the result declaration. In the online examination system,paper use gets reduced. It saves paper and costs from paper. The online examportal is accessible to everyone and allows students to take exams from anylocality if they have a stable internet connection. You can import questions to theautomated system. There will be a systematic distribution of a set of questions. Moreover, students can access the exams from multiple devices. The auto-gradedsystem that the online examination system provides helps you reduce evaluation highly reliable online assessment software will help you create questions with customization. With this, you can choose and personalize the type of questions in the online examination. You can choose from the different types of questionsavailable. Also, there is exclusive online assessment software that helps you in assessment. Thus, you can conduct exams without any discrepancies.

4.1 SELECTED METHODOLOGY OR PROCESS MODEL: For developing an online examination portal using a full-stack approach, a suitablemethodology to consider would be the Agile development methodology. Agilemethodology emphasizes collaboration, flexibility, and incremental development, making it ideal for web development projects. Agile methodology involves breaking down a project into smaller, moremanageable iterations called sprints. Each sprint involves planning, designing, developing, testing, and delivering a set of features or functionalities. This iterativeapproach allows the development team to continuously receive feedback and adjust their approach accordingly, leading to faster development and better end To further enhance the Agile methodology, a suitable process model to follow could be the Scrum framework. Scrum is an Agile process model that focuses iterative and incremental development, emphasizing on on

collaboration, transparency, and continuous improvement. In the Scrum framework, there are three main roles: the Product Owner, the Scrum Master, and the Development Team. The Product Owner is responsible formanaging the project's requirements and prioritizing the development team'sbacklog. The Scrum Master is responsible for ensuring that the Scrum process isfollowed, and the Development Team is responsible for designing, developing, testing, and delivering the product. In summary, using the Agile methodology with the Scrum framework is a suitableapproach for developing an online examination portal using a full-stack approach. This approach would ensure that the project is developed incrementally and

incrementally and collaboratively, with continuous feedback and improvement.results.

27 Adding of the modules into the portal they are as follows: Teacher's Panel :-On one hand, the teacher has some important roles in maintaining proper flowwithin the system. This particular user can conduct examinations, set questionpapers, and check his/her student's results. The very first step of conducting anexamination is that teacher requires to set a bundle of question sets for a certaincourse. For this, the user has to provide questions, five options, select the correctanswer, and set question weight. And now, here comes the main thing of thisproject; Exam management. Likewise, the user has to provide various details such as examination name, number of questions, date & time with question pattern. Here, the system offers two types of patterns: Random and Sort. After completion, the system automatically generates a token code which is a mandatory part for thestudents in order to join their online examination. It contains a dashboard that provides real-time status like pending, active and suspended in every group. Itallows you to create new questions for the computer-based examination system. You can also set the duration of the newly added exam. You can contact Gibbonto understand the differences between the modules and functionalities of an onlineexam portal. Furthermore, the admin has the power to add, enrol and removestudents manually. Admins can transfer the admin rights to any individual as well. Examination Token, Examination Result :-

MODULES:

With it, the system provides a token for every examination record. This particulartoken code must be shared with the students which later works as a kind ofverification during their examination period. Also, the teacher account can have adetailed report on his/her student's results. The result shows highest/lowestmarks on each with average scores and other important details. Moreover, theteacher has the right to manage examinations anytime. In fact, this particularfeature is only setfor teachers; meaning even the administrator does not have anycontrol over the examination management system. All the duties and rules are tobe handled by the teacher's account. This unit focuses on the title of the

the assessment, method of assessment, stipulated time for the assessment, minimum ²⁸ passing score, and guidelines that examinees must adhere to while taking theexam. The administrator has the authority to activate or deactivate functions

suchas exhibiting response sheets after the exam, immediate outcomes,

adversemarking, arbitrary questions, and highest tries. Moreover, the

administrator canenable or disable client-side functions such as reviewing,

storing, and submitting the ultimate answers in an internet-based examination platform. Student's Panel :-

On the other hand, comes the main feature of this project. The main role of astudent's account is to attend online examinations. Nevertheless, the student canproceed with attending available examinations. In fact, all the examinations areformed as Multiple Choice Questions. Here, the student needs to provide a tokencode for the particular examination. Also, the student should make sure about theexamination date and time. Else, the system won't allow entering and attendingexaminations. At last, the system generates the student's result under the Resultsection where he/she can easily list out or even download it. In addition, thesystem strictly restricts users to attend examinations multiple times.It exhibitsfunctionalities that the admin has enabled and the exam format for students. Itshows the performance, points earned, and the position secured by the studentamong all. Students will benefit a lot from this functionality of the computer-based examination system. Content Management Module :-This module plays a crucial role in managing all the questions in the database byexporting or importing a file with a question bank and adding questions. It allowsyou to choose the type of questions, difficulty level, number of questions and themarking scheme. Also, you can assign different questions for different groups of students with the online exam portal.

4.2 ARCHITECTURE / OVERALL DESIGN OF PROPOSED SYSTEM: Fig:4.1:

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Architecture For Online ExaminationPortal

The architecture and overall design of an online examination portal using a fullstack approach can be broken down into several components: The front-end of the system is responsible for providing a user interface for students,teachers, and administrators to interact with the system. The front-end can bedeveloped using modern web development frameworks like React, Angular, or_{Vue.js}, which provide easy ways to build dynamic and interactive user interfaces. The back-end of the system is responsible for handling the business logic, datastorage, and user authentication. A suitable server-side technology like Node.js orPython can be used to develop the back-end, along with a relational database like_{MySQL} or



communication between the front-end and back-end.Restful API s can be used to send and receive data in JSON format, allowing for_{easy} integration between the two components. User authentication is an essential component of an online examination portal.Authentication can be implemented using industry-standard protocols like Oath or_{Open ID} Connect to ensure that users are who they claim to be. Security is a critical aspect of any online portal, especially when dealing withsensitive data like examination results. Security measures like encryption, firewalls,and intrusion detection systems should be implemented to ensure that the system is secure and protected against potential attacks. Testing is a crucial part of the development process to ensure that the systemfunctions as intended. Automated testing frameworks like Jest or Mocha can beused to write tests for the front-end and back-end components, ensuring that any_{issues or bugs are caught early in the development process.}

4.3 DESCRIPTION OF SOFTWARE FOR IMPLEMENTATION AND

TESTING_{PLAN OF THE PROPOSED MODEL/SYSTEM}: For the implementation and testing plan of the proposed online examination portal using a full-stack approach, the following software and tools can be used: Front-end Framework: React - A popular

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front-end framework for building dynamicand interactive user interfaces. It provides a component-based architecture that allows for reusable code, making development faster and more efficient. Back-end Framework: Node.js - A serverside technology that allows developers tobuild scalable, high-performance applications using JavaScript. Node.js provides a non-blocking I/O model, making it suitable for building real-time applications. Database: MySQL - A widely used opensource relational database managementsystem that provides fast and reliable data storage. MySQL is suitable for handling large amounts of data and is compatible with many programming languages. API Testing Tool: Postman - A popular tool used to test and debug APIs. It provides an intuitive interface for sending requests, viewing responses, and debugging errors. Testing Framework: Jest - A JavaScript testing framework that provides an easy to-use API for testing frontend and back-end code. Jest is popular for its fast test execution time and its ability to run tests in parallel. Implementation Plan: Develop the front-end components using React and create a user interface that

is_{intuitive and easy to use.} Develop the back-end components using Node.js and MySQL to handle data_{storage}, user authentication, and business logic. Create RESTful APIs to communicate between the front-end and back-end Implement user authentication and security measures to protect against potential components. attacks.

Conduct thorough testing of the system to ensure that it functions as intended

and is free of bugs and issues. Testing Plan:

Unit Testing - Conduct unit testing of individual components to ensure that they function as intended. Integration Testing - Conduct integration testing to ensure that the front-end and back-end components work together seamlessly. User Acceptance Testing - Conduct user acceptance testing to ensure that the system meets user needs and is intuitive and easy to use. Load Testing - Conduct load testing to ensure that the system can handle a large number of users and maintain performance under heavy load. Security Testing - Conduct security testing to ensure that the system is secure and protected against potential attacks. By following a well-planned implementation and testing process, the onlineexamination portal can be developed and tested to ensure that it is reliable, efficient, and user-friendly. To implement and test the system, we can follow an Agile methodology with theScrum framework. We can break down the development into smaller, moremanageable sprints, each focusing on developing and testing specific features orfunctionalities. We can use continuous integration and deployment tools likeJenkins or Travis CI to automate the testing and deployment process, ensuring that the system is always up-to-date and functioning correctly. 33

4.4 PROJECT MANAGEMENT PLAN: A project management plan for an online examination portal using full-stack should_{include the following components:} Project Scope: The project scope should define the boundaries of the project andwhat features and functionalities the system should include. This should include a_{list of requirements}, user stories, and use cases. Project Schedule: The project schedule should include a timeline for each phase of the project, including planning, development, testing, and deployment. It should also include milestones and deadlines to ensure that the project stays on track. Project Budget: The project budget should outline the estimated cost of the project, including the cost of hardware, software, personnel, and other expenses. This should include a breakdown of the cost for each phase of the project. Project Team: The project team should include the roles and responsibilities of each member of the team, including developers, designers, testers, and project managers. It should also include a communication plan to ensure that team Risk members stay informed and updated on the project's progress. Management: The risk management plan should identify potential risks andhazards that may impact the project, along with strategies for mitigating and managing these risks. This should include a plan for dealing with any unforeseen. Quality Management: The quality management plan should outline the processes and procedures for ensuring that the system meets the desired quality standards. This should include a plan for testing, bug tracking, and issue resolution. Change Management: The change management plan should outline the processes and procedures for managing changes to the project scope or requirements. Thisshould include a plan for handling change requests, assessing the impact of changes, and communicating changes to stakeholders. Stakeholder Management: The stakeholder management plan should identify the stakeholders of the project, their

needs and expectations, and how to engage and

communicate with them throughout the project. Timeline: The timeline should include a detailed schedule of the project, includingmilestones and deadlines for each component of the system. This

timeline should be realistic and take into account potential delays and setbacks. Communication plan: The communication plan should define how communication will be managed throughout the project. This includes regular meetings, progress reports, and stakeholder updates. Project objectives: The project objectives should clearly define what the projectaims to achieve. These objectives should be specific, measurable, achievable, relevant, and time-bound (SMART). Resources: Identify the resources required for the project, including personnel, software, hardware, and other materials. Overall, a well-defined project management plan is essential for the successful development and implementation of an online examination portal using full-stack. It provides a clear roadmap for the project team, ensures that everyone is workingtowards the same objectives, and helps to mitigate potential risks and setbacks. awell-planned project management plan will ensure that the project is executed efficiently and effectively, meeting the requirements of stakeholders and delivering a high-quality online examination portal using full-stack technology.

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stack approach are as follows: Planning: Before starting the implementation process, we need to plan the projectby defining its scope, objectives, timeline, resources, budget, risks, communication, quality, change management, and stakeholder engagement. Design: Once the project plan is finalized, we can move to the design phase, where we will design the user interface, data schema, and system architecture. Front-end Implementation: The front-end of the portal will be implemented modern web development frameworks like React, Angular, or Vue.js.usin Theseframeworks will be used to build the user interface and provide a dynamic and interactive experience for the users. The front-end will include various features like user login, exam registration, exam results, and feedback. Back-end Implementation: The back-end of the portal will be implemented usingserver-side technologies like Node.js or Python. These technologies will be used todevelop the business logic and handle data storage. The back-end will include features like user authentication, exam management, and result generation. API Implementation: RESTful APIs will be used to provide communication between the front-end and back-end of the portal. The APIs will be developed usingtechnologies like Node.js, Python, and Express.js or Flask. These APIs will be responsible for handling requests and responses between the client and server. Authentication Implementation: User authentication will be implemented usingindustry-standard protocols like OAuth or OpenID Connect. Libraries like Passport.js will be used to simplify the implementation of these protocols. Security Implementation: Security will be implemented using SSL/TLS certificates to encrypt data in transit. Firewalls and

intrusion detection systems will be used to

³⁶ protect against potential attacks. Additionally, security testing tools like OWASP ZAP or Burp Suite will be used to test the security of the portal. Database

Implementation: Data storage will be implemented using a relational database management system like MySQL or PostgreSQL. The database will be used to store user information, exam details, and result data. Testing Implementation: Automated testing frameworks like Jest or Mocha will beused to write tests for the front-end and back-end components. Tools like Seleniumor Cypress will be used to perform end-to-end testing and ensure that the portal is functioning correctly. Deployment Implementation: Continuous integration and deployment tools likeJenkins or Travis CI will be used to automate the testing and deployment process. The portal will be deployed on a cloud-based platform like AWS, Azure, or Google Cloud Platform. Maintenance and support: After the deployment, we need to provide ongoing maintenance and support for the system, including bug fixes, updates, Overall, the implementation of an online examination portal using a fulland stackapproach requires the use of modern web development frameworks, serversidetechnologies, APIs, authentication protocols, security measures, databases, testing frameworks, and deployment tools. By implementing these components

effectively,

the portal can provide a robust and reliable platform for conducting onlineenhancements. examinations.

5.1 DEVELOPMENT AND DEPLOYMENT SETUP: The development and deployment setup for an online examination portal using full stack technology can vary depending on the specific technologies used and thepreferences of the development team. However, a typical setup may involve

the

following steps: Development Environment Setup: The development team needs to

version control system like Git, and the necessary dependencies and libraries for the

front-end and back-end Front-end Development: The development team can start

building the front-end using a modern web development framework like React,

Angular, or Vue.js. They can useHTML, CSS, and JavaScript to create the UI

sidetechnologies like Node.js or Python. They can use Express.js or Flask to

create the RESTful APIs and connect with the database. Database Setup: The team

components and connect with the back end using RESTful APIs. Back-end

Development: The team can start building the back-end using server-

set up their local development environment with the required software and tools.

This may include atext editor or integrated development environment (IDE),

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can set up the database management system like MySQL, MongoDB, or

PostgreSQL to store and retrieve data for the online examination portal. They

need to design the data schema according to the requirements of the system and

connect the back-end with the database using an ORM (Object-Relational Mapping) tool like Sequelize or Mongoose.

Authentication and Security Setup: The team needs to set up OAuth or OpenID Connect for user authentication and SSL/TLS certificates for encrypting data in transit. technologies.

They can use Passport.js or other authentication libraries to simplify

theimplementation of these protocols. They can also use firewalls, intrusion

detection systems, and security testing tools to protect against potential attacks. Testing and Quality Assurance: The team needs to perform unit testing,

integrationtesting, and end-to-end testing to ensure that the system is functioning

correctly. They can use automated testing frameworks like Jest or Mocha to write tests for the front-

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end and back-end components. They can also use tools like Selenium or Cypress to_{perform end-to-end testing.} Continuous Integration and Deployment: Once the testing is completed, the team canset up continuous integration and deployment using tools like Jenkins or Travis CI. They can use a cloud-based platform like AWS, Azure, or Google Cloud for hosting_{the system}. Maintenance and Support: After deployment, the team needs to provide ongoing_{maintenance} and support for the system, including bug fixes, updates, and ^{To set up the} development and deployment environment for an online examination_{portal using} full-stack technology, we can follow these steps: ^{Choose} a suitable IDE (Integrated Development Environment) for development.Some popular IDEs for web development include Visual Studio Code, Atom, and _{Sublime Text}. Install the latest version of Node.js on your local machine. Node.js is a popular_{runtime environment} for executing JavaScript code outside of a web browser. Choose a suitable web framework for developing the front-end of the application._{Some popular web} frameworks include React, Angular, and Vue.js. Choose a suitable web frameworks for developing the back-end of the application._{Some popular web} franeworks include React, Angular, and Vue.js. Choose a suitable web frameworks include Express.js, Koa, and Nest.js. Choose a suitable database management system (DBMS) for storing and retrieving_{data}. Some popular DBMSs include MySQL, PostgreSQL, and MongoDB. enhancements.

Set up a local development environment by installing and configuring the necessarytools and dependencies. This includes installing the web frameworks, DBMS, and other packages and libraries required for development. Develop the application by writing code for the front-end, back-end, and databaselayers. Use modern web development techniques and tools to ensure the application is scalable, secure, and efficient.

Test the application by performing unit testing, integration testing, and end-toendtesting. Use testing frameworks like Jest, Mocha, and Cypress to write and run tests.Deploy the application to a suitable hosting platform like AWS, Azure, or GoogleCloud. Use continuous integration and deployment tools like Jenkins, Travis CI, or_{GitHub} Actions to automate the deployment process. Monitor and maintain the application by tracking its performance, analyzing user_{feedback}, and fixing bugs and issues that arise. To implement and test the system, we can follow an Agile methodology with theScrum framework. We can break down the development into smaller, moremanageable sprints, each focusing on developing and testing specific features orfunctionalities. We can use continuous integration and deployment tools likeJenkins or Travis CI to automate the testing and deployment process, ensuring_{that} the system is always up-to-date and functioning correctly. Overall, the development and deployment setup for an online examination portal using full-stack technology requires careful planning, attention to detail, and a focuson best practices and standards for software development. With the right tools and_{techniques}, we can build a robust and reliable application that meets the needs of itsusers.

Testing online examination portal using a full-stack project involves ensuring that all components of the application, including the frontend, backend, and database,

areworking correctly and reliably. Here are some key aspects of testing a fullstack project for online examination portal: Functional Testing: This testing involves checking whether the application's features and functions are working as expected. For example, you should verify that users can register, login, take exams, view their scores, and perform other necessary Performance Testing: This testing involves checking whether the application canhandle a large number of users simultaneously. You should simulate multiple users taking an exam simultaneously and ensure that the application doesn't slow down or Security Testing: This testing involves checking whether the application is secureand protects user data. You should verify that the application has appropriate security measures in place, such as user authentication, data encryption, and protection against common web application attacks. Compatibility Testing: This testing involves checking whether the application workscorrectly across different devices, browsers, and operating systems. You should verify that the application is accessible and usable on a wide range of platforms. Usability Testing: This testing involves checking whether the application is user friendly and easy to use. You should verify that the application's user interface is intuitive and easy to navigate. actions.

Overall, testing a full-stack project for an online examination portal requires acomprehensive approach that covers all aspects of the application's functionality, performance, security, compatibility, and usability.crash.

CHAPTER 6

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An online examination RESULTS AND DISCUSSION portal is a web-based platform designed to

conduct and manage online exams. A full-stack project is a software

application that comprises frontend, backend, and database components. In this context, the onlineexamination portal using a full-stack project aims to provide a reliable and efficientplatform for conducting exams online. The implementation of an online examination portal using a full-stack project can offer several advantages, such as increased accessibility, convenience, and flexibility. Students can take exams from anywhereat any time using their devices, and the portal can automate several administrativetasks, such as grading, result processing, and reporting. The portal's frontend component provides the user interface for students and administrators to interact with the platform. It includes features such as user registration, exam scheduling, question selection, and submission. The backend component manages the application's logic, communication with the database, and user authentication. The database component stores the exam questions, student details, and examresults. To test the online examination portal using a full-stack project, various types of testing can be conducted, including functional testing, performance testing, security testing, compatibility testing, and usability testing. The testing should ensure that the portal works efficiently and reliably, and the data is secure, accurate, and consistent. Based on the testing results, we can discuss the portal's strengths andweaknesses. If the portal functions smoothly,

securely, and efficiently, it can beconsidered a successful implementation. The portal's strengths may include its user friendly interface, automated grading, and reliable data management. On the otherhand, if the portal has several bugs, security vulnerabilities, or compatibility issues, it_{may require further development} and testing to overcome these issues. In conclusion, implementing an online examination portal using a full-stack projectcan offer several benefits for both students and administrators. The portal canaccessible platform for conducting exams online. Testing the portal thoroughly and_{addressing any issues can help} ensure its success and improve the user experience.

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CHAPTER 7

7.1 CONCLUSION:

With the completion of this project I conclude that it has achieved its purpose. Thewhole project provides a base for students to take their exam using software andallow lecturers to add questions and answers into the system. The system isdeveloped using Java programming language and data are saved in the database.Online examination system for introduction to management course is the bestcompared to paper-based exam. The automated system helps students andlecturers to save time and makes the process faster. It saves space since answerspapers will not be used. With a user friendly system that has security, integrityandthe database is neither inconsistent nor redundant. Choosing an open-sourcelanguage provides more flexibility, but it also increases the time spent onprogramming. Educational institutions can easily implement the proposed internet based testing platform (IBTP) to improve the security and versatility of their exams. The IBTP consists of two main subsystems (one for students and one foradministrators) and is designed to maximize the benefits of the system by carefully displaying the functionality of each subsystem. It has welldefined administrative functions for managing user information, such as adding,

deleting, and managingexam resources and study materials. By replacing Inquiries with Questions, thesuggested system is easy and adaptable for future maintenance and enhancement, as each component can be controlled independently of the others. The system achieves the objectives of the online testing system and resolves issues. A final report is generated according to the client's requirements. The packages are user friendly and require varying levels of support. The design of the online exam is simple to use for decision-making. 7.2 FUTURE WORK: An online examination portal project has a wide range of potential future scopes. Here are some possibilities: Enhancing the User Experience: In the future,

the focus will be on providing amore user-friendly experience to the users. The examination portal can be improved with better navigation, more intuitive interface, and

personalization. More customization options: The portal can be further customized to suit the specific needs of different organizations or educational institutions. This

involve providing options for creating custom exams, adding new types could

of untegrating with Artificial Integrating with Artificial Intelligence and Machine Learning: The use of AI andmachine learning can be incorporated into the online examination portal to make itsmarter and more efficient. For example, an AI-based chatbot could be integrated to answer student queries. Improved Security: Security is always a concern with online exams. Future developments in encryption technology and biometric authentication can be incorporated to make the examination portal more secure. Gamification: Gamification can be used to make the learning process moreengaging and interesting. Adding game-like elements such as points, badges, and rewards can

make the examination portal more appealing to students. ^{Mobile-Friendly Interface:} With the growing popularity of mobile devices, it isessential to have a mobilefriendly interface for the online examination portal. In the future, the portal can be further optimized for mobile devices to ensure a_{seamless experience} for the users.

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7.3 RESEARCH ISSUES: There are several research issues that are faced by us: Security and authentication: One of the most important research issues whendeveloping an online examination portal is ensuring the security and authentication of the system. This includes preventing unauthorized access, protecting against hacking and other cyber attacks, and ensuring the confidentiality of exam questions and answers. Validity and reliability: Another key issue is ensuring the validity and reliability of the exam questions and scoring. This involves developing a rigorous testing andvalidation process for the exam questions and ensuring that the scoring algorithm is accurate and consistent. Accessibility: It is important to ensure that the online examination portal isaccessible to all users, regardless of their abilities or disabilities. This includesproviding support for assistive technologies and ensuring that the user interface is easy to navigate and understand. Performance and scalability: As the number of users increases, the performanceand scalability of the system become critical. Research issues in this area includeoptimizing the system architecture and algorithms for maximum performance, and ensuring that the system can handle large numbers of simultaneous users. Usability: Another important research issue is the usability of the onlineexamination portal. This includes conducting user

studies to understand how usersinteract with the system, and identifying ways to improve the user interface and user experience. These are just a few of the many research issues.

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7.4 IMPLEMENTATION ISSUES: Implementing an online examination portal using a full-stack project can be a complex task that requires attention to several issues. Some of the key implementation issues to consider are: Security: Security is a significant concern when implementing an onlineexamination portal. The portal should protect users' data, prevent unauthorized access, and ensure the integrity of exam questions and answers. Implementingstrong encryption techniques, secure authentication, and access control mechanisms can help ensure the portal's security. Scalability: The online examination portal must be scalable to accommodate alarge number of users simultaneously. The portal should be able to handle hightraffic without slowing down or crashing. To achieve scalability, developers can use cloud-based hosting services, distributed databases, and load balancing Compatibility: The portal must be compatible with different web browsers anddevices. Students may access the portal from various devices, such as laptops, tablets, or smartphones, and different web browsers such as Chrome, Firefox, Safari, and Edge. Testing the portal on multiple devices and browsers and ensuring compatibility is essential. Performance: Performance is critical for an online examination portal. The portal should load quickly, minimize latency, and respond promptly to user actions. Optimizing server-side code, caching frequently accessed data, and minimizing network requests can help improve the portal's

performance. User Experience: The portal's user experience (UX) is essential for its success. The portal should be user-friendly, intuitive, and easy to navigate. The

UX should be consistent across different pages and devices, and users should be

able to perform tasks with minimal effort.

techniques.

Accessibility: The online examination portal must be accessible to users withdisabilities. It should comply with accessibility standards such as WCAG 2.1, which ensures that the portal is usable by people with visual, auditory, motor, and cognitive impairments. Data Backup and Recovery: The portal's data should be backed up regularly toprevent data loss in case of a system failure. The backup data should be storedsecurely, and the recovery process should be tested to ensure that the data can_{be restored quickly.} In conclusion, implementing an online examination portal using a full-stack project requires addressing various issues related to security, scalability, compatibility, performance, user experience, accessibility, and data backup and recovery.Addressing these issues can help ensure the portal's success and provide a_{reliable} and efficient platform for conducting exams online. ⁴⁷
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York:PrenticeHall
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in Technology and Teacher Education, 6(2), 230-245. [8] Gina, C. O. and Bob O,

Viewing the WEB as a marketplace: the case of small companies, Decision Support

Systems, Vol. 21, No. 3, pp. 171-183.

[9] Mund, Andre, Rotsawatsuk, Prawit, and Sawhney, Anil,

"EnhancingConstruction Engineering Education Using Intern et based Tools",

American Societyfor Engineering Education (ASEE) Annual Conference Proceedings, NorthCarolina.

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A. SOURCE CODE:
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"This file locks the dependencies of your project to a known state", "Read more about it
at https://getcomposer.org/doc/01-basic "This file is @generated automatically"
],
"content-hash": "38ce0abd2050db0106355a9c407c297c",
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                                                        APPENDIX
"packages-dev": [
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<sup>{</sup>"name": "markbaker/complex",
"version": "1.4.7",
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"type": "git"
usage.md#installing-dependencies",
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"type": "zip".
"reference": "1ea674a8308baf547cbcbd30c5fcd6d301b7c000",
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48

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"classes/src/operations/divideinto.php"]

"MIT"

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},"dist": {
"mathematics"
"type": "zip",
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},

"url":

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"shasum": ""
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"name": "codeigniter/framework",
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epage": "https://codeigniter.com",
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"forum": "http://forum.codeigniter.com/",
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"slack": "https://codeigniterchat.slack.com",
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"php": ">=7.0"
};
"suggest": {
                                                                                      54
"paragonie/random compat": "Provides better randomness in PHP 5.x"
},
"require-dev": {
şwitch (ENVIRONMENT)
<sup>1</sup>case 'development':
ini_set('display_errors', 1);
}
}
case 'testing':
case 'production':
Index.php:
ini_set('display_errors', 0);
if (version_compare(PHP_VERSION, '5.3', '>=')) {error_reporting(E_ALL &
~E_NOTICE & ~E_DEPRECATED & 
~E_STRICT & ~E_USER_NOTICE &
```

```
~E_USER_DEPRECATED);
error_reporting(-1);
```

break;

```
error_reporting(E_ALL & ~E_NOTICE & ~E_STRICT &
default:
header('HTTP/1.1 503 Service Unavailable.', TRUE, 503); echo 'The application
```

environment is not set correctly.'; exit(1); // EXIT_ERROR

else

{

~E_USER_NOTICE);

}

break;
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Result Page

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C.RESEARCH PAPER: ONLINE EXAMINATION USING FULL STACKY.Hemanth Chowdary

B. Manith Kumar²

Department of CSE, DR. A.C.Santha Sheela³Assistant Professor Department of CSE, Sathyabama Institute of Science Department of CSE, Sathyabama Institute of Science and and TechnologY. Sathyabama Institute of Science and

An on-line examination system is a software program answer that permits a selectedorganization or group to organize, behavior and administer assessments via a websurroundings This may be accomplished via the Internet surroundings, intranet and/orneighborhood vicinity network. The software program is evolved the usage ofprogramming languages and databases. In the software program we are able tosign in as customers and customers are of kinds as school and college students. Before the usage of the gadget, each customers have to sign in after which they have tolog in with their username and password to get right of entry to the gadget The on-linecontrol access examination gadget includes diverse components, for instance thefeature of logging in, placing information into the database and extracting informationfrom the database The trouble with the cutting-edge gadget is that scholars take thecheck manually This previous gadget will take a long term to use; The guide methodused to take the assessments is a time eating one. Teachers spend greater timehanding out questions and solution sheets, and college students additionally want greater time writing tests.

Keywords: Auto Grading ,Examination, Web-Based Technology. Technology. Iamhemanth09@gmail.com manithkumarbolishetti5@gmail.com santhasheela.cse@sathyabama.ac.in CHAPTER 1: ABSTRACT: Automated online systems are becoming

offline applications are replacing paper tovast databases of information. This means afundamental change in

education.Information technology makes it possible to exchange information quickly

and easily. more and more popular in all aspects of education. Information technology plays a very important role in today's education. Computers and the Internet have fundamentally changed the educational system. Information technology can save Today, advances in technology arereducing the amount of information in

theworld. Technological advances bring many benefits in education and all areas of

the

universities time and money and simplify coursework anytime, anywhere.Online and INTRODUCTION

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economy that employ them. Advances in resource requirements, manpower,

technology have made trading faster, more monetary and agency strengths

are identified and analyzed.

accurate, and more efficient. Over time, computers have become more convenient With this stuff glad and absolutelyunderstood, the subsequent step is todecide the specification of the softwareprogram inside the respective system, asto what form of operating machine is needed for the motive, and what is in all transactions. Online Exam System Introduction Management is an application designed and developed for students and teachers This system assists students in their exams It also helps teachers to upload guestions and answers to the database and see passing or failing students. CHAPTER 2:

LITERATURE SURVEY:

needed to transport in all of the necessary software. To the followingsteps to expand

The author has

related tools and AUTHOR NAME: HUANG DARONG

researched an online exam_{system that combines Struts 2,}

Spring and Hibernate. The options for viewing summary results are based on an

important feature of online exams: online fields are populated.

Literature review is the most essential step in the software development process. Before the device is advanced, the time factor, the economic system and the power of

the corporation must be decided.

When most of these situations are met, the following step is to determine which Also S2SH system (Struts2 + Spring

+Hibernate) has been applied to this

running machine and language can be framework by separating multiple management

layers such as view layer,

used to develop the tool. When programmers begin constructing a tool,

audit layer, business logic layer, data access layer into different components.

they need quite a few external help. This aid can be received from older software program, from books, or from web sites.

According to Huang Darong (2010), an Before creating a machine, the ones online exam system, even in the web system development phase, he uses the MVC (Model_View_Controller) pattern to

issues are taken into consideration whilst the system is being developed. achieve loose coupling between phasesThis system has a deletion system in

the database and enhances the capabilities of The maximum a part of the project

The maxir activities.

development is considering and fully

the security control system along withauthenticated access techniques and

powerroles. The results of this research show that the Struts2 + Spring +

Hibernater systemcan be incorporated into an online examsystem, and has been

well received with Struts 2, Hibernate and Spring.

discovering all of the requirements

essential for the development of the assignment. For any reason, literature evaluation is

the maximum critical a part

of the software program development process. Before the gear are advanced and their related layout, time issue, useful

AUTHOR NAME: RIA MAE

Storage : 4 GB (or above) Input Devices : Keyboard, Mouse

The author mentions an online testing Monitor : 15"LED

system that can be administered manually

System : Pentium Dual Core.3.2 SOFTWARE REQUIREMENTS Operating system : Windows 7.

or automatically by teachers. Teachers can submit questions online and students can

answer and submit their answers online over the Internet. With this online exam

system, the evaluation process can be done automatically The researchers examined

the type and format of exam questions

included in the online exam system Coding Language : HTML,CSS,JS

The above research shows that testing and Database : EXCEL

Toolkit : Vs code CHAPTER 4: remote monitoring are becoming

increasingly important for home comfort,

security and affordability Not only does this

increase the importance of course-based and remote exams, it also helps MOOCs

(Massive Open Online Courses) and other

The entire process of test

EXISTING METHODOLOGY

assignment and post-test scoring has been manual up to this point

Processing of test documents, i. H.

performance-based certifications build credibility. The online exam software and

monitoring system provided uses advanced,

secure and reliable artificial intelligence to monitor students and score exams. An

Validation and distribution of relevantresults when the software is not installed The

current system will last a long time

automated, web-based exam system that detects and flags anomalous activity to ensure proper exam administration The

Analyzing trials manually is very difficult.

target group for this study are social and Multiple examiners are required

toadminister exams for multiple candidates Calculations and estimates were made

and

applied science students. The goal is at

least 6 out of 20 state universities in the the results are not exact. With

currentsystems, it takes a lot of time to manuallyprocess the results, which

increases the chances of losing paper.

The estimated sample size is at least 400 students. A questionnaire containing nominal

data is used A simple random sample is used in this study

CHAPTER 3: CHAPTER 5: PROPOSED METHODOLOGY An online test designed for conducting_{online} tests has the following characteristics: SYSTEM REQUIREMENTS^{In the proposed system, the analysisbecomes very}

easy due to its automation. The calculations and evaluations are done

3.1 HARDWARE REQUIREMENTS Ram : 4GB(or above) Processor : 13 (or above) country.

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by the simulator itself, so the results are basic structure of the system , we suggest very accurate, precise and explained in a to implement every architecture

diagram basing on our proper requirement.

very short time. The proposed system is very secure as there is no possibility of survey leak as it only relies on the CHAPTER 7:

administrator A record of the candidates that have appeared and their votes is saved and can be saved for future use. At the end of this project, I conclude that it CHAPTER 6:

achieved its goal The overall project provides a framework for students to use the

software to take exams, and teachers

SYSTEM ARCHITECTURE

can add questions and answers to thesystem. The system is developed using the

the Java programming language and data is

System Architecture Design is the system stored in a database. An online exam

of designing to discover the subsystems system for introductory management

that make up the system and the courses is better than paper exams

subsystem control and communication Automated systems help students and

framework. The cause of structure is to teachers save time and speed up

the process.No answer sheets save space You

establish the general structure of a

software device.

can save. Intuitive and secure systemensures no database inconsistencies or CHAPTER

8:

RESULT Using an open source language gives you more flexibility, but it also

increases

your programming time The proposedonline exam system (OES) can be

easilyadopted by universities and institutions to make exams safer and more flexible

system is divided into two mainsubsystems (one for students and one_{Th}

foradministrators) and designed to maximize the benefits of the system by

carefully

demonstrating each subsystem service Ithas clearly defined

functions for handling user information administrativ such as: B.

Adding (Registering) Users,

Fig 1 : System Architecture for the Deleting Users, and Managing Exam Materials and

Content. B. Add Questions,

proposed methodology Delete Requests. Therefore, the



The above system architecture forms the redundancies.

CONCLUSION

64 proposed system is easy and flexible for to commercial Web sites", Journal ofAdvertising Research, Vol.37, No. 3:59-66.

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future maintenance and development, as each subsystem can be controlled independently without affecting other systems Successful completion of the [9] Bryan, J. 2020. Technology forphysics instruction. Contemporary Issuesin

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online judging system System goals achieved and issues resolved A final report is produced according to the client's specifications Packages are designed to be easy to use and require r101 Gina, C. O. and Bob O, Viewing the WEB as a marketplace: the case of small different levels of support Online exam design is easy to use for decision making

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