

Integrated And Secure Web Based Examination Management System

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Abstract- A web-based examination management system is discussed that is developed in house. It is planned based on the three-tier architecture edition of Java enterprise. It allows us to define and setup exams which leads to a flexible tree-based exams structure. It comprises of many text editors for composing exams that are suitable for different disciplines like language, engineering etc. In order to relieve the instructor from cumbersome task it automates the reporting, grading and scheduling processes. It's unification with many databases allow it to use different security schemes that support multi factor authentication, prevent any malpractices and impression detection. In order to help student to take exam easily it has an informative and simple wizard. Even, the results have illustrated that the system is successful in establishing online exams in several semesters. The survey asserts that the system is user friendly, gives fast result, has cutting edge technology, highly dependable and available.

I. INTRODUCTION

In the past few years on-line exams have gained lot of popularity as they support e-learning and facilitate setup of exams that are held throughout the world and large number of students attend them. However, adopting to such a system can be tough as well as challenging because of various concerns which are related to integration with existing systems, security of the data, customization of the system based on the institution's need and cost. Therefore, developing a web-based Examination Management System (EMS) is the aim of this paper. The EMS has been mainly developed to offer an online-based secure exam management system this system provides security against database backtracks and monitoring the activities by recording the examination sessions. Typically, many students attend such exam and conducting offline exam require significant preparation in terms of time, money and labour. Even the correction process of paper-based exam is quite troublesome, it requires manual grading process which consume lots of time and chances of errors are high. Hence, online exam system overcome all the above-mentioned issues that occur during paper-based examination. The online exam system that is adopted should address to obtain the desired GJU requirements. It should provide an administration portal

so that the administrator can manage all the users account and can even manage the exam .

II. LITERATURE REVIEW

- [1] The Social & Mobile Learning Experiences of Students Using Mobile E-Book: This motive behind this research was to find the experience of students using e-book in their mobile or other devices. The research was done to find out how students used these textbooks for their college study. This research undergoes many cases study which investigate and even documents what the student experience while using these instructional technology. Bounding frames were included on mobile/online learning theories, mobile technologies, and e-books. A theoretical lens of the online learning models which are commonly found in the literature on mobile learning was present in the mobile learning framework. This lens provides the student's learning experiences a vision. One of the major drawback is the lack of confidence in the trainer or teaching staff, and technical problem with the device.
- [2] Cloud Computing Through Mobile-Learning: Cloud computing is arising technology with many benefits and in the present scenario it's highly adaptable. It provides on demand services like application, processing power and storage over the internet. The main benefit with this technology is that it reduces the cost of implementation of hardware and software for providing the services over the network. This is the best time to study the implementation of cloud to develop a low cost and better-quality education platform for students all over the world. This paper discusses that how cloud computing can be used effectively so large number of students can be benefited, taking online education to wider mass. They believe that with the use of cloud computing their will be an increase in demand of online education and it will also help in improving the quality of education at an affordable cost. In this work they are mainly focusing on the data uploading on cloud. A Platform on the Cloud for Self-Creation of Mobile Interactive Learning Trails: This paper deal with creating a mobile based interactive

learning system. It has a web portal running on the Amazon cloud server that generate trail for online learning for people with no knowledge of programming, and it even provides two apps for Android and iOS phones to run diverse learning trails. And without need of any mobile app development it can rapidly create learning trails within 15 minutes. The content of this platform can be modified by the professors, and this can be activated by clicking pictures from the physical OOI. To determine which OOI is used to capture the image recognition is used it returns the relevant data that is associated with the OOIs. Accuracy and efficiency in data uploading is improved in this system.

- [3] Extending Moodle Services to Mobile Devices: The Moodbile Project: Learning Management Systems (LMS) are most widely known among school, college and many educational institutions. Although LMS is a developed technology but still the revolution of online learning is left to the devices. To make the whole learning process more learner centered Mobile Learning (M-learning) can be used it increases the communication making the process effective. With help of LMS it integrates educational application and android phones Instead of just copying LMS function to mobile app Moodbile provide the designer of m-learner with the required tools set this permit the device to communicate with the LMS.
- [4] Towards a Theory of Mobile Learning: This paper has changed the learning way for youngster, it recognize the important role of mobility in learning process, in order to find this help in supporting digital network and communication in virtual learning. This provide a platform for m-learning to provide an alternative of classroom learning and it complements the any sort of informal learning that can be either institutional or workplace. The aim is to notice the new technologies that help in m-learning, since this environment is created by a series of project that can be used to design a learning platform. Traditionally the activity theory can be divided into two activity. The semiotic layer defines learning as object-oriented programs that uses tools and signs. In technological layer learning is combined with technology, it uses computer and cell phones as tools. These layers can be separated to discuss theories for analysis purpose and even help in providing suggestion to the software developers for new design and evaluation technique for this m-learning. In order to test the dynamics of learning these two layers can be superimposed.
- [5] Smart and Secure Exam Management System for Mobile Learning Environment: In past few years learning has seen a high-rise worth of 91 billion USD. Learning Management Systems (LMSs), being a major e-learning tool is adopted by many institutes and colleges to provide student unlimited access to learning services online. LMS is at the peak of success so almost 74% of United States od educational corporation and institute suggest the use of LMS in e-learning training program. Thus, the industry should change and and adjust to the new technologies and and user’s demand. Therefore, continuous interaction should be there with external applications like social networking sites and with mobile application. All these factors must be included in LMS so that it meets the needs of personal learning requirements. In case of M-learning the learner has the control of the learning courses and this increases the flexibility of the system and enhance the collaboration. So, it can be concluded that e-learning benefits student learning process as it is affordable and students can continue their learning anytime and anywhere. The students who participated in this study told that with help of e-learning their self-efficacy has improved and even they have learned additional things. With many other factors effecting m-learning, cloud computing takes mobile learning to next level by making it more effective by reducing the cost and helping the student to make the best of their time.To help teacher with no computing knowledge to apply for interactive learning process Amazon cloud computing services is used. The resources build can be used with mobile apps on iOS devices and even android based devices.
- [6] Mobile Learning Security Issues from Lecturers’ perspectives (Nigerian Universities Case Study): The m-learning has created a new trend for teaching, group discussion and learning. It enable communication among learner teachers and peers, and even allow them to access the resources required for learning. Examinations can be conducted through mobile devices and intern responses can be given by them. Teachers can provide the notes and instruction while the students can either listen to the lecture or record it to listen later anytime whenever he wants. M-learning take classroom learning and support modern learning with help of mobile devices. This has made the learning a fun and exciting experience for student as well as for teachers.
- [7] Online Secure Examination Process using M- Learning Techno: Computer security is protection of computer from any theft or damage. This field consists of tools and mechanism that protect the computer data from any unauthorized access, theft, damage and changes.It even prevents from any unplanned events and failures.

Computer security is a way for ensuring data security and prevent from manipulation by unauthorized user. Computer security deals with password creation and data encryption. Data encryption is the process of encapsulating the data to prevent data loss. A password is a phrase that is known only to the user for accessing any particular file or system.. The general method to conduct online exams require exam centres with full system security. This method reduces the amount installation and maintenance of this environment. But this method is not feasible for m-learning where students have access to the internet using their android phones. Using student's smart phones for examination offers many advantages such as it is low cost, more student can take exam simultaneously , and need of wired network in not required. Therefore, strong security is required in this case which can be enforced using suitable mechanism.

III. EXISTINGSYSTEM

The complete project of online examination systems were examined by analyst. Such as, the problem encountered during electronic exams. The results obtain by analysing the e-exam were mainly focused to make the system efficient, robust and flexible. Online exam system supporting automatic exam paper generation was introduced. An online English exam system based on JEE and web based Arabic exam system was introduced. Besides, several systems were build that support secure online exam through mobile platform was also introduced. This is a three-tier exam system that is built on SSH that is Struts, Spring and Hibernate (SSH). An online Exam platform that build Quiz Maker software so as to generate online exam packages which were displayed on a separate browser was developed.

So an Online Assessment and Evaluation System (OAES) which authorizes the exam was introduce. Thus, an online exam system that group the questions based on the course outcomes was introduced. Based on student intelligence the difficulty of the test was adjusted. The online exam system was capable of selecting random question and is capable of recovering from system failure.

IV. PROPOSEDSYSTEM

We come up with a secure integrated exam management system which can be able to monitor the student activities using the recording the exam sessions and secure the database server. The advantage of using the cloud technology is that it decreases the effective cost for the installation of software and hardware and license for all. This is the best time to study the implementation of cloud for low cost and better

quality of education for students all over the world. In this paper, we discussed the use of cloud computing technology and its effect to take education to larger section of students. Thus, the use of cloud has improved the current education system at a low cost.

4.1 Requirement Specifications

4.1.1 Functional Requirement:

- Create a web application which contains staff, user.
- Staff will generate the question and answer to the system.
- System encrypt and store in database. 4. Students will write the exam.
- While writing the exam system will record the screen and generate the video of the user's session.
- System will upload the video to the cloud.
- Application should provide high security of online examination system.

4.1.2 Non-Functional Requirement:

- Performance: It is the ability of the software to perform the specified task effectively and it is usually measured in terms of response time and throughput.
- Dependability: The students and the institution using the software should be able to rely on the software.
- Capacity: The system should be able to store large amount of data in its server.
- Operability: It should be easy to use.
- Interoperability: The software should be platform independent so that it can be easily run on various operating system.
- Scalability: The system should be capable of any sort of modification based on user requirement and it should not affect the performance of the software.
- Availability: The software should be able to provide its service to the user at any time without any failure.
- Maintainability: The software should be robust enough to perform in any condition and the bugs can be fixed easily.
- Randomness: The software should be capable enough to generate random question.

4.1.3 Software Requirement:

- Operating system: Windows 7-It is a type of operating system that was manufactured by Microsoft It was developed after Windows Vista. It got released on July 22,2009.

- Coding Language: java. It is a general-purpose programming language. It is class-based, object-oriented programming language. It is used for JDBC connection.
- Tools: NetBeans: NetBeans is an integrated development environment that support Java language. In this the applications are developed from modules. NetBeans runs on Windows, macOS, Linux and Solaris.
- Data base: MySQL: MySQL is a database management system based on SQL. It is used for data warehousing, e-commerce, and logging applications. It is used to create web database.
- Cloud: DriveHQ: It is a cloud server with best customer support.

4.1.4 Hardware Requirement:

- System: Pentium i3.
- Hard Disk: 120 GB.
- Monitor: 15” LED
- Input Devices: Keyboard, Mouse
- Ram: 4GB

4.2 SEMS Security Agent

The student's can exchange data illegally during online exam with the help of their devices that are connected to college's Wi-Fi network. Enforcing simple techniques, such as making the server down for the duration of exam to prevent communication is not a feasible solution as many students won't give exam simultaneously. Moreover, the server should not be down otherwise student won't be able to submit their response. A potent network policy should be created and integrated with the student's device based on specified condition. Installing a biometric verification-based firewall can be seen as a practical solution that is helpful in this environment. However, it comes with some limitation:

1. This software neither block cellular communication nor Adhoc communication via Bluetooth. .
2. “Unattended exam” issue cannot be handled by this system. For these kind of issues the m-learning environment need to have specially designed protocol.
3. Accessing offline pdf file which have been downloaded previously onto the student's device cannot be prevented by this software because in this scenario there is no need to access network.

4.3 Online Exam Strategy

In this, students can give online exam in a secure manner through channels which are recognized by exam server. It has many advantages over the classic paper-based exam. Such as it enable students to use the shared library of online books and various website pre specified by the lecturer to conduct open book exam. In addition to this conducting secure exam is a big challenge in an open environment. In this scenario the system adopt various network access control which enforce different mechanism in different situation. Such as , if the scholar is not attending exam then all modes of communication via Bluetooth and Wi-Fi are allowed. and Wi-Fi communications. Else all modes of communication are blocked the one which is connected to the server through which he can access the shared library and submit his responses.

V. CONCLUSION AND FUTURESCOPE

This paper has introduced and integrated an online Secure Exam Management System in order to provide exam security to prevent any threat that are present in the learning environments. The exam management system that we have developed provide various functionalities like easy assessment, developing random choices for examination, security, preventing any attempted assessment issue, preventing any sort of malpractices using image processing and continuous facial scanning and biometric identification. Therefore, by using these special offline and online mechanism and the exam is conducted securely.

REFERENCE

- [1] “Think Act - Corporate Learning Goes Digital,” Roland Berger Strategy Consultants, https://www.rolandberger.com/media/pdf/Roland_Berger_TAB_Corporate_Learning_E_20140602pdf. May 2014.
- [2] “2014 Training Industry Report,” TrainingMagazine, http://www.trainingmag.com/sites/default/files/magazines/2014_11/2014_Industry-Report.pdf. Nov/Dec 2014.
- [3] M.P. Prendes, “PLATAFORMAS DE CAMPUS VIRTUAL CON HERRAMIENTAS DESOFTWARE LIBRE: Analisis compare ativode la situation actual en las universidades españolas,” Informedel Proyecto EA-2008- 0257 de la Secretaría de Estado de Universidades e Investigación, 2009.
- [4] G. Yamamoto and C. H. Aydin, “E-Learning in Turkey: Past, Present and Future,” e-Learning Practices, vol. 2, Midase Book, pp. 961-987, 2010.
- [5] S. Wexler, N. Grey, D. Miller, F. Nguyen, and A. Barnevelde, “Learning Management Systems: The good,

- the bad, the ugly and the truth,” The E-learning Guild, May 2008.
- [6] “Learning Management Systems Market by Users – Worldwide Market Forecasts and Analysis 2013 – 2018,” Markets and Markets, <http://www.marketsandmarkets.com/Market-Reports/learning-management-systems-market-1266.html>. Oct.2013.
- [7] L. Johnson, S. A. Becker, V. Estrada, and A. Freeman, “NMC Horizon Report: 2015 Higher Education Edition,” The New Media Consortium, <https://net.educause.edu/ir/library/pdf/HR2015.pdf>.2015.
- [8] “Ericsson Mobility Report,” Ericsson Inc., <http://www.ericsson.com/res/docs/2014/ericsson-mobilityreport-june-2014.pdf>. Jun.2014.