Designing a Secure Exam Management System (SEMS) for M-Learning Environment

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Abstract: - The Secure exam management system is a Mobile Learning process. However, enforcing exam security in open environments where each student has his/her own mobile/tablet device connected to a Wi-Fi network through which it is further connected to the Internet can be one of the most challenging tasks. By using Internet or WiFi Connections students can easily exchange information during exam time. In m-learning environments where the Students mobile/tablet devices that can be connected to an Internet browsing or e-book reading, as well as for the sake of exams. Using student's mobile devices as exam stations offers the advantage of low cost, more exam takers at the time, and no need for a wired network. Thus, a dynamic security policy is needed in this case with an appropriate enforcing mechanism.

Key words— e-learning, m-learning, Learning Management System (LMS), Access control, exam engine.

I. INTRODUCTION

Students' mobile/tablet devices or computer/ laptop are connected to the school's Wi-Fi or LAN network through which they may illegally exchange information during an exam. Applying simple policies, such as turning the network down during exams to cut off any possible communication between students, is not a practical solution as students in different classes may not take their exams at the same time. Moreover, the network has to be up during exams in order to be able to submit students' answers to the Exam Server. A dynamic network access policy has to be generated and applied on each student's device according to predefined conditions. Employing an identity based firewall with dynamic access policy seems to be a good solution to be adopted in such a scenario.

II. LITERATURE SURVEY

Title: Security Risks and Protection in Online Learnin
Author: Yong Chen and Wu He[8]
Description: This paper describes a survey of online education which attempts to determine online education providers' awareness of potential security hazards and the protection measures that will reduce them. The authors use a mixture of two methods: blog mining and a traditional literature search. The findings specify that, while scholars have identified diverse security hazards and have proposed solutions to mitigate the security

threats in online education, bloggers have not deliberated security in online learning with great frequency. The modifications shown in the survey results generated by the two different methods check that online learning sources and practitioners have not considered security as a top priority. The paper also deliberates the next generation of an online education system: a safer personal learning environment which needs a one-stop solution for authentication, assures the security of online assessments,and balances security and usability.

Title: Information Security Management in E-Learning
Author: NajwaHayaatiMohdAlwi and Ip-Shing Fan[5]
Description: E-learning is a new system of learning and it depends on the Internet in its execution. Internet has become the place for a new set of prohibited activities and E-learning environment is now uncovered to the threats. In this paper the advantage and growth of e-learning is explained. This paper deliberates the security elements desired in e-learning. In addition, explains the circumstance and existing research on security in e-learning. Information security management is advised to contribute in preparing the secured e-learning environment.

Title: Security & Privacy Challenges in E-Learning 2.0
Author: Edgar Weippl, Martin Ebner [7]
Description:E-Learning 2.0 uses Web 2.0 tools for e-learning. New amenities on the Internet can be swiftly

combined into existing applications; students can create MashUps, for illustration, using a variety of amenities on the Internet.The main risk comes from the fact that students and teachers are not entirely aware that their organization does not control these services. The servers are located in a variety of countries, thus secrecy laws also differ. In addition, as most Web applications are built as three-tier architectures, typical security weaknesses exist, such as unacceptable input, a lack of server side checks, and excessive rights.

Title: Security in the Online E-learning Environment
Author: Ruth Raitman, Leanne Ngo, Naomi Augar and Wanlei Zhou . Wexler, N. Grey, D. Miller[9]
Description:This paper reports the role of security in the collaborative e-learning background, and in particular, the social aspects of security and the significance of identity. It also represents a case study, completed in Nov 2004, which was conducted to test the logic of security that students experienced whilst using the wiki platform as a means of online collaboration in the tertiary education environment. The difference between two wiki studies will be made whereby one group employed user login and the other maintained anonymity throughout the course of the study. The results consider the independent participation and evolution of the work requirements over time, which in fact determines the no validity of administrative identification.

III.EXISTING SYSTEM

The classical approach to perform e-exams involves providing specific exam centers equipped with machines configured with static security policy to be used only for exam purposes. This approach brings about the cost of creation and upkeep of the environment, and continuous under utilization thereof. Also, such policies cannot be applied in m-learning environments where the students' mobile/tablet devices are meant to be used for general purposes, e.g. Internet browsing or e-book reading, as well as for the sake of exams. Using students' mobile devices as exam stations offers the advantages of low cost, more exam takers at the same time, and no need for a wired network. Thus, a dynamic security policy is needed in this case with an appropriate enforcing mechanism.

Disadvantages Of Existing System:
• In existing system does not address the security and privacy issues related to conducting exams in m-learning environment, and neither does the Moodle Quiz Engine which emphasizes only on the learning process not on securing the examination process.

• The "Secure Exam Environment" described in existing supports exams taken by students on laptops. The system denies access to local files and Internet, but allows the use of certain programs like Excel and Java applications. Students have to connect their laptops to the wired LAN and boot from a USB drive or DVD.
• Other e-exam systems developed based on mobile platforms with wireless access lack proper security considerations and exam management functions.

IV.PROPOSED SYSTEM

In this paper we are providing an exam system which can use a mobile device for taking upon exam on our proposal we are focusing on how we can provide secure exam system.Our proposal includes secure where randomized questions are distributed to each and every student with a time limit set for each question so as to avoid browsing for solutions to check student authentication biometric authentication is added to the system at the same time OTP sent to the conform the authentication.giving a two round security to the exam system.

Advantages Of Proposed System:
• This approach where the mobile devices are utilized for taking up exams is a new concept.
• It helps the student to take up exam in the same slot as required helps the institute to conduct exam with the low cost and high profit.
• Authentication adapted for stronger security.
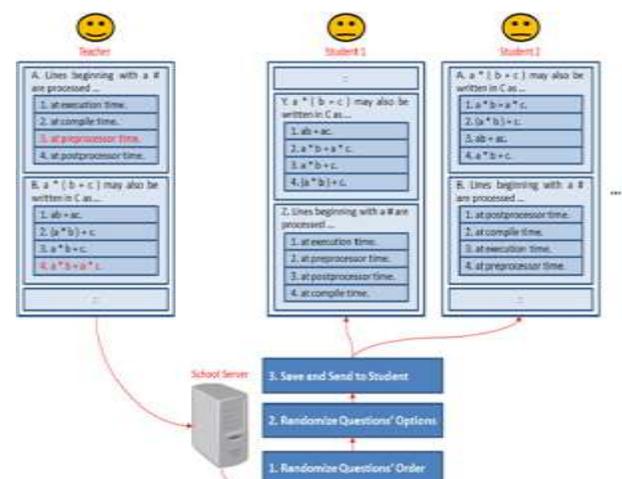
V.WORKING OF SYSTEM ARCHITECTURE:

Fig:system architecture

1.Enabling the teacher to define a bank of exam questions and to link them to his/her subject through an appropriate interface (Subject's Question Bank Interface).In case of objective kind of questions, each question may have a set of options. The teacher has to provide those options through the same interface and specify the correct choices among them to enable the exam engine to auto-evaluate students' answers. In case of descriptive kind of questions, a text box (or probably a sketching canvas) will appear below each question at the student device screen to allow him/her to write/draw the question's answer; those answers will be saved at server side to be further reviewed and evaluated by the teacher. In addition,each question will have a property to specify its difficulty "level" (let's say: A, B, C, D, and E).

2. Enabling the teacher to specify a subject's exam properties such as: Date and Time, Duration, Percentage of level A, level B, and level C questions in the exam paper, etc., through an appropriate interface (Subject's Exam Setup Interface).

3. Securely authenticating and enrolling students, using any of the well-known secure authentication mechanisms,into exams at the pre-defined date and time through the Exam Enrollment Interface. Multifactor authentication can be adopted for stronger security

4. Creating exam instances by random distribution of exam questions to the enrolled students' mobile/tablet devices according to the predefined exam properties such as percentage of each question level. This means that questions are not going to reach students in the same order. Moreover, the multi-choices of each question,in case of objective questions, will be flipped randomly and delivered differently to each student. The Exam Server associates the exam questions with a message digest signed by its private key to ensure data integrity. The Exam Server also has to memorize the way it has distributed the questions to each student to be able to evaluate the correct answers once the students submit their answers back to the Exam Server. that each student gets different questions order and makes cheating by "hand-signals" impossible.The prepared questions bank is reusable. Teachers can always enrich their courses' questions bank by adding new questions or upgrading old ones during the semester. At the exam time, it is the responsibility of the Exam Server to create exam instances out of the questions bank. Incorporating the "question level" concept helps the Exam Server to prepare a moderate kind of questions while selecting them out of the questions bank.

5. Students answer the exam questions through the Exam Client Software Interface. Their answers are then submitted to the Exam Server along with a signedmessage digest to ensure the integrity.

6. Processing students' answers to determine their grades in the test. The Exam Server has to evaluate students' answers according to the questions' correct solutions pre-defined by the teacher. Then it has to generate the appropriate reports.

VI.WORKING OF MODEL SETUP:

1. System Setup
2. User
3. Security Schemes
4. Result Generation

Module Descriptions:

1. System Setup
We are setting up our system with a single server with multiple clients apk. through client apk teachers and students can register or login. All the clients should be connected in a same network.

2. User:
In our interface two different types of users can interact
1.Teachers
2. Students

3.Exam controller
1.Teacher interface is developed in Client Side. Teacher can set the questions based on subjects.Teacher can delete the questions which added previously.
.2.students can register and login with the credentials Students they can select the subject and attend for the examination View their exam result.
3.Examination controller will schedule the exams will generate the result for the students.View all the students results

3. Security Schemes:
To protect question and answer leakage from the Attacker we are using DDDES algorithm to encrypt the questions and answers.To authenticate the user we are verifying user by using OTP.To prevent from the malpractice we are implementing Randomizing the questions for the user.To preventing from the usage of internet surfing we are setting time limit for every questions.

4. Result Generation:
Exam Controller will generate the result once student complete their exam and they will send mail to corresponding student.If students are trying to do any answer copying from internet immediately their result will become zero and more over they are disqualified to write the same subject. they can't able to write the same subject for three years.
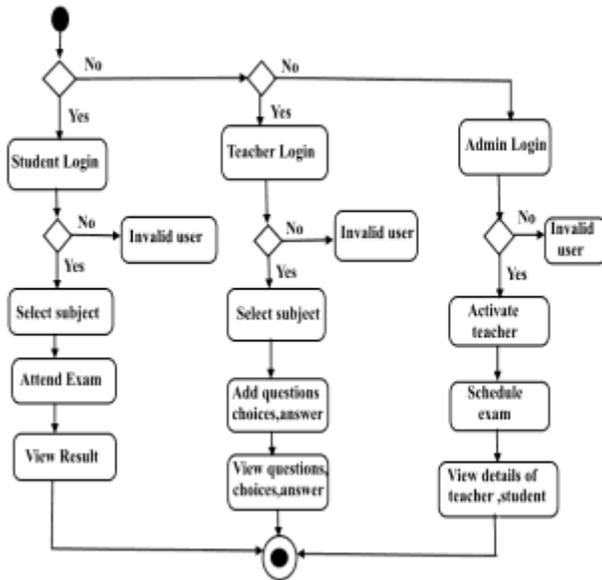
Figure:activity Diagram.

VII.SECURITY ISSUES

Security issues are a real challenge to the system.we are providing security by including Biometric authentication for candidate verification and with OTP to his registrated mobile for permitting him to take up exam on his mobile device are some of the measures taken in the development of our model.
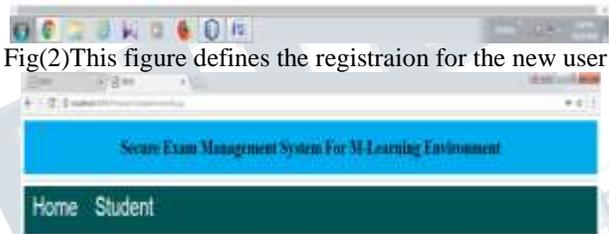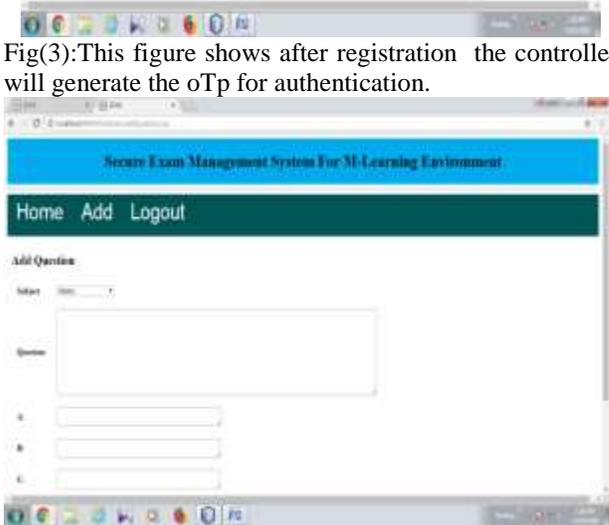
VIII.RESULTS:

Fig(1)this figure contaion student,teacher and controller modules in home page

Fig(2)This figure defines the registraion for the new user

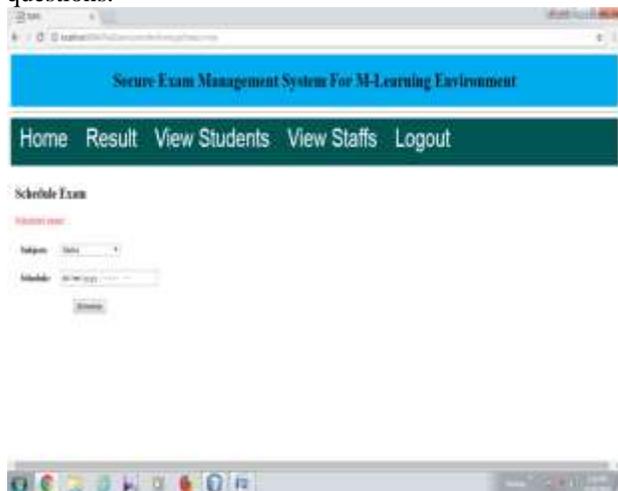Fig(3):This figure shows after registration the controller will generate the oTp for authentication.

Fig(4):This figure shows the teacher can add and delete the question for respective subject

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Fig(5):This figure shows an students multiple choice questions.

Fig(6):This figure shows contoller can schedule the time and date for an appropriate subjects.

IX.CONCLUSION

This Paper SEMS offers many exam services such as: secure and random distribution of exam questions,biometric-based authentication service for anti impersonation, preventing students from exchanging their devices during an exam, conducting exam securely through online. This also helps in prevention of the "unattended exam" issue, OTP based authentication system .It saves time as it allows number of students to give the exam at a time and After writing exam automatically the Server will Generated the Result Administrator has a privilege to create, modify and delete the test papers and its particular questions. User can register, login and give the test with his specific id, and can see the results as well.The main purpose of taking up exam even through mobile devices with security and authentication.

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