



SMART AND SECURE EXAM MANAGEMENT SYSTEM THROUGH QR CODE BASED AUTHENTICATION

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Abstract — Almost all of the data testing systems are applied as paper-based. There have been numerous studies to apply exams online and perform the measure and analysis processes through laptops since technological means that like computer and net are wide employed in academic activities. In these exams, students take tests either on a written document and place their answers on a sheet; or they answer them on a computer display screen. Besides, in these sorts of exams, all candidates are required to answer the same questions in exams. M-Learning has increased the e-learning by making the learning methods learner-centered. However, enforcing exam security in open environments where each student has his/her device connected to a Wi-Fi network through which it is further connected to the internet can be one of the much difficult and challenging work. In such environments, candidates can easily exchange information over the network at time of exam in the exam hall. This project aims to identify various vulnerabilities that may violate exam security in m-learning environments and to design the appropriate security services and countermeasures that can be put in place to assure exam security. It additionally aims to integrate the resulting secure exam management system with an existing, open source and wide accepted Learning Management System (LMS).

Keywords: Access control, e-learning, exam engine, Learning Management System (LMS), m-learning.

I. INTRODUCTION

E-learning is the new technique of learning and it depends on the Internet in its execution. Internet has become the venue for a new set of illegal activities and E-learning environment is exposed to the threats. E-learning has experienced such an extraordinary growth over the last years that its global industry market is estimated to be worth USD 91 billion. Learning Management Systems (LMSs), due to being essential tools of e-learning, have been adopted by many organizations to establish and provide access to online learning services. Nowadays, the success of LMSs is so great: 74% of the US corporations and educational institutions currently offering e-learning employ LMSs in their training programs. Thus, LMSs should amend to adapt to new user necessities and technologies. As an example, interaction with external applications, such as social networks and mobile applications must be incorporated in LMSs to facilitate personal learning demands that happen anywhere and at any time. M-learning puts the control of the learning process in hands of the learner itself and enhances collaboration and adaptability.

Learning Management Systems (LMSs), due to being essential tools of e-learning, have been adopted by many organizations to establish and provide access to online learning services. From student's point of view, m-learning could personalize their learning process as well as enable them to collaborate with other students or teachers. From teacher's point of view, they could continue to use LMSs as their working platform, leaving mobile devices for students. The problem, however, is that the integration between m learning applications and LMS is not an easy task. Indeed, LMSs do not generally contain interoperability standards to communicate with external applications; they are usually designed as monolithic or layered systems. Enforcing exam security in open environments wherever every student has device connected to a Wi-Fi network through which it is further connected to the Internet can be one of the most challenging tasks. The Quiz Engine embedded in Moodle isn't built based on Service Oriented Architecture. It is designed as a bulk of PHP code that has to be accessed through standard internet web browsers that are a unit slow on mobile devices and can't address the exam security issues that exist in m-learning environment. Moodle services extension to Moodle does not touch the Moodle's Quiz Engine. Thus, we need to design and implement a new Quiz Engine that can be deployed as

a service oriented application, so that its services can be consumed by a mobile application designed to cater to m-learning specific security requirements. As well, it should be Integra table with Moodle/ Moodbile in order to have a complete LMS which suites the m-learning environment and addresses all of its security issues. In a Wi-Fi based network, we cannot guarantee that each student is going to attend an exam from a dedicated classroom. A student can simply sit in a nearby room and log in to the exam system through the Wi-Fi network. He/she can subsequently open his/her course notes and use it to answer the questions illegally. To encounter this issue, we propose the system which is based on QR code strategy, by which student will able to attempt the exam only when he/ she is allowed by the authorized admin or examiner.

II. PROPOSED SYSTEM:

This aims to identify various vulnerabilities that may violate exam security in m-learning environments and to design the appropriate security services and countermeasures that can be put in place to ensure security in exam management system. It also aims to integrate the resulting secure exam system with an existing, open source and widely accepted Learning Management System (LMS) and there service enhanced to the m-learning environment, particularly “the Moodbile Project”. To design a Secure Exam Management System (SEMS) that meets the distinct security requirements of m-learning environments and to integrate it with the current Moodle/Moodbile platform. This will result in a complete LMS that is both equipped with secure exam services and suitable for m-learning. Our intention of integrating SEMS with a well-known LMS such as Moodle is so to get the benefits of Moodle’s readymade services in other learning aspects such as course material administration, documentation, etc. which have been experienced and appreciated for the last 15 years. However, the proposed SEMS can also work as a standalone secure exam management system for m-learning environments without integration with Moodle.

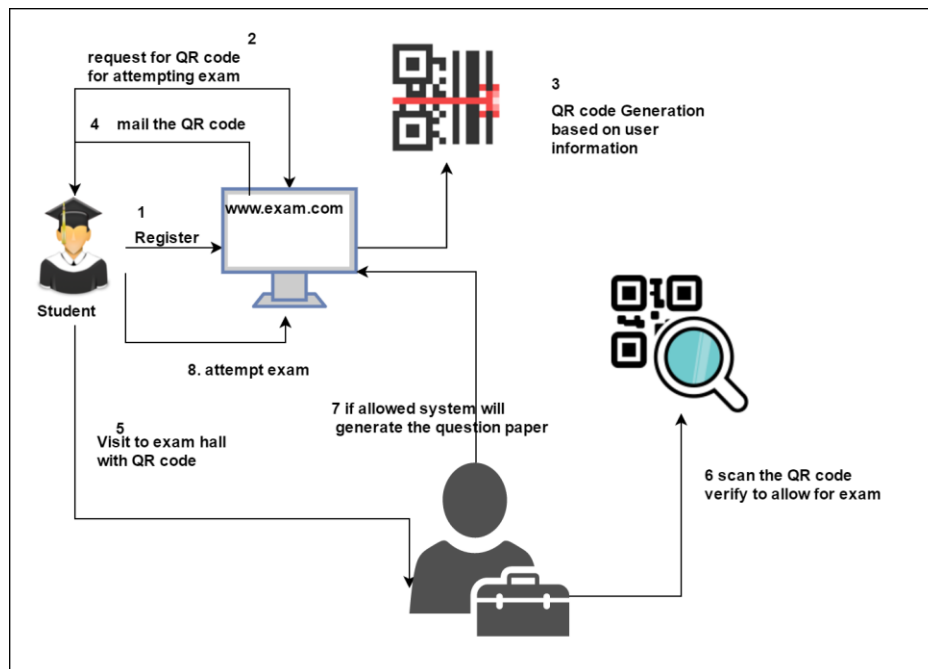
III. SYSTEM ARCHITECTURE

Step1: In this registration phase every candidate or user has to register themselves in order to give an exam.

Step2: After registration the will get an QR code image which is encrypted information of user information. The same information will be stored at the server side for admin/ examiner record. The secret key K is send to admin record, which is used for decryption purpose.

Step3: user will bring that QR code image while coming for exam then, admin. Examiner will scan that QR code image to check whether authenticated candidate has come for exam or not, the verification process done by that user information stored on server or examiner record, upon verified the admin will send the question paper Q to user account.

Step 4: user will login to system, to attempt an exam.



System Features:

1. Web Application:

In the part the student or candidate will register themselves to the exam system, upon registration they will be provided by a username and password with QR code which is generated by the given information at the time of registration. This QR code will generated by the encrypted information of user details.

The candidate will login to system, to give exam upon allowed by examiner.

2. QR Code Base Strategy:

The system will generate the QR code for every student who is attempting to the exam. This QR code will be considered as hall ticket for attempting exam, the QR code contains the information of student/ candidate which has been submitted at the time of registration to the system.

3. Scanner (Android Application):

The scanner will be placed at the examiner. The examiner will have standard login details just like admin; apart from this authorized person no can use this application. After examiner or admin login he will scan the QR code of candidate, after scanning the encrypted information will be shown on application. There will a decrypt and verify option, after clicking that button the encrypted information will be decrypted and verified with the database record whether the student/ candidate has been valid registered or not. If yes then admin allow the candidate to attempt the exam.

4. Random Generation of Question Paper:

The system will generate the random question paper for each student who is attempting the exam. This system is different from traditional question paper system where the particular number of set of question papers is generated. In this system the student will get the exam paper only when the student is verified and allowed by examiner no matter what time he came for exam.

V. PSEUDO CODE

A. Web Application

Step 1: Start.

Step 2: Students will registered to the system.

Step 3: After login students will request for hall ticket (QR code), system will generate the QR code of requested student based on information submitted on registration process.

Step 4: Visit to exam center and shows QR code to examiner for verification .

Step 5: Attempt the exam

 If student is allowed for examiner / admin then

 System will generate the question paper to student

 Else

 Not allowed for exam or wait till confirmation.

B. Android

Step 1: Start

Step 2: Examiner / admin will scan the QR code.

Step 3: check whether candidate is already allowed or not.

 If yes

 Not allowed

 Else

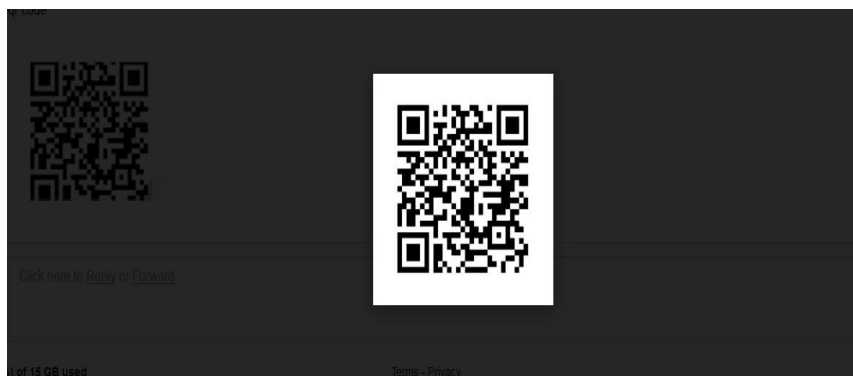
 Allowed.

Step 4: End.

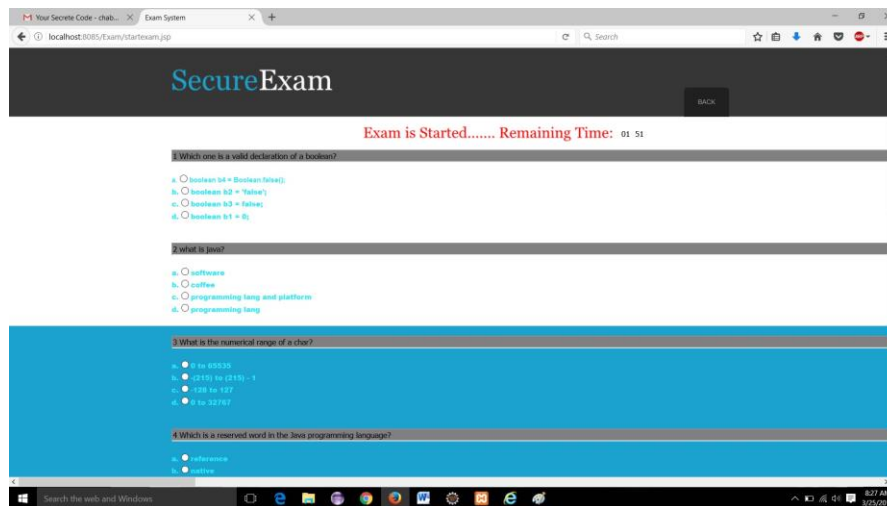
V. SNAPSHOTS



This screenshot displays the 'Candidate Registration Form'. The form contains input fields for First Name, Last Name, ID Card, Gender, Email, Contact No., Address, Blood Group, Username, and Password. It includes 'Submit' and 'Reset All' buttons. A sidebar menu on the right provides navigation to Home Page, Candidate Registration, Login, Examiner, and Admin. A search bar is also present at the top right.



This screenshot shows the login screen for the 'Online Exam System'. It has a purple gradient background. The text 'Welcome to Online Exam System' is at the top. Below it, there is a login form with the username 'examiner' and a masked password '*****'. A prominent 'LOGIN' button is at the bottom of the form. The top of the screen shows a mobile status bar with the time 6:39 PM.



V. CONCLUSION

Introduced the design and implementation of a Secure Exam Management System (SEMS) to mitigate the unique exam security threats that exist in m-learning environments. SEMS offers many exam services such as: secure and random generation of exam question papers with options to those questions respectively, turbo-mode assessment, prevention of the unattended exam issue, biometric-based authentication service for anti impersonation, preventing candidates from exchanging their answers during an examination is running, conducting exam securely through online or offline strategies, and auditing. We are using the QR based strategy to authenticate the student who is attempting the exam in the exam hall by the examiner who has the unique android based application which can scan the QR code to validate and allowed the student for exam.

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