Secure Exam Management System

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Abstract: *Nowadays there are two kinds of coaching and education: Distance education and standard education. Mobile learning, or "M-Learning", offers modern ways to support learning process through mobile devices, such as handheld and tablet computers, smart phones and mobile phones, MP3 players. Mobile learning wants to enhance the learning experience of our students and academics. However, enforcing exam security in open environments where every student has her or his own tablet or mobile devices connected to a Wi-Fi network through which it is further connected to the web will be one in all the foremost difficult tasks. This system discusses the background of mobile learning and how it can be used to enhance the whole eLearning system and introduces the subject of mobile learning for education purposes. The system also highlights the benefits and future challenges of mobile learning in our educational environment in both online and offline mode. The system will detect & capture the face of the candidate & it will be send to the admin, if candidate cheats, during the exam then system will terminate the exam and send a message on candidate's mail.*

Keywords: Security, M-Learning, E-Learning, SEMS

1. Introduction

One definition of Mobile learning or M-Learning is, "any kind of learning that happens once the learner isn't at a set, preset location, or learning that happens once the learner takes advantage of the training opportunities offered by mobile technologies" (Mobil earn., 2003). In different words, with the employment of mobile devices, learners can learn anywhere and at any time (Crescent and Lee, 2011). Mobile devices are units among people rather than desktop computers, and have a less expensive technique of internet access. Currently, the pill PCs permits mobile net access with equal or a lot of practicality than desktop computers. The term mobile learning or briefly M-Learning refers to the utilization of mobile and hand-held IT devices, like mobile telephones, laptops, PDAs and pill computer technologies, in coaching, learning and teaching. The mobile learning is thought-about as a result of the third wave of learning with mainframe and, desktop computers as a result of the first and second waves. Some students might use their mobile devices in foreign language categories. Different students may use their mobile cameras to photograph blackboards, PowerPoint or the opposite very important documents.

Therefore, mobile devices area unit associate economical educational platform, as a result of the particular incontrovertible fact that mobile devices area unit merely accessible by students and provide adequate support for traditional internet technologies. Victimization trendy ways and techniques integrated in M-learning, facilitate in creating the training of our student a lot of attention-grabbing, a lot of interactive, wide obtainable and versatile. This is cost-effective that helps students to be told a lot of while not ancient restrictions. What is more, the likelihood to integrate systems into existing E-learning systems makes it straightforward to remain involved with the latest advances created in teaching analysis.

Mobile and wireless technologies are used in technique for learning and education. M-learning facilitate to find outer to learn the expertise that accessible in surroundings. The main target of subsequent generation of the educational systems is to use current and trendy technologies to supply new techniques of learning, training and education that will be easy access and available to all. One of the main benefits of is its possibilities to improve students' productivity by making knowledge and learning available anytime and anywhere. It is additionally attainable to facultative learners to participate in learning activities while not the standard place and time restrictions. Mobile technologies support accessible and wide accessible learning than the educational that utilized in the present E-learning environments. M-learning supports performance with easy accessibility to data, which can immediately impact students' performance in a learning environment, facilitating their education. M-learning manages completely different learning necessities, where it is ideally geared for allowing students to get knowledge at their own speed. To enhances two-way interaction where it supports direct communication between students and their respective teachers. M-learning is self-motivated, nonindulgent that supports learning with on time waste, learning anyplace and at any time. There area unit completely different researches has been created supported the need style, architecture, m-learning model and so on. There additionally some applications area unit accessible in market to manage or monitor the progress of m-learning surroundings. AI provided a new approach of Mobile environment with mobile device and personal computer to progress and performance of M-learning. The system will detect & capture the face of the candidate & it will be send to the admin, if candidate cheats, during the exam then system will terminate the exam and send a message on candidate's mail.

1) Challenges of M-Learning
- Design an efficient context aware mobile application.
- Provide a lot of security over the wireless device.
- Prevent the revealing of the learner data via network.
- Could need further learning turn for non-technical trainee.
- Enable the employment of Machine Learning application across mobile platform.

2) Benefit of M-Learning
- Support distance learning.
- Can enhance student targeted learning.
- Great for JIT training or review of content.
- These are often used a lot of effectively for the differently abled.
- Support differentiation of student thirst for knowledge and personalized learning.
- Can enhance interaction between students, learners and instructors.

2. Problem Statement

The Quiz Engine embedded in Moodle is not built based on Service Oriented Architecture. enforcing examination security in open environments wherever every student has his/her own mobile/tablet device connected to a Wi-Fi network through that it's more connected to the web will be one of the most challenging tasks, to solve this problem we proposed an open source and widely accepted Learning Management System and its service extension to the m-learning environment, namely "the Mobile Project".

3. Literature Review

1) Designing and implementing an adaptive online examination system
Authors: Mustafa Yagci, Menderes Unal
Description: A design and application of adaptive online exam system are carried out in this paper. Adaptive exam systems determine different question sets automatically and interactively for each student and measure their competence on a certain area of discipline instead of comparing their gains with each other. Through an adaptive exam technique, a student's distraction and motivation loss that is led by the questions with quite lower hardness level than his/her competency is prevented. In addition, negative effects of questions requiring higher knowledge than his/her competency over a student's self-confidence and morale are dismissed. Since questions are specialized so that they can allow making clear deductions about student gains, they are able to detect student competencies more effectively. Requiring less total time for measuring and being more flexible in the exam management are among the advantages provided by the system. Self sufficiency of the system in terms of planning, repeating and assessment of the measurement process especially allows itself to be used in the individual education sets. Through this system, student competencies can be determined more effectively in cases such as distant-learning, in which some challenges are experienced frequently.

2) A platform on the cloud for self-creation of mobile interactive learning trails
Authors: Yiqun Li, Aiyuan Guo, Jimmy Addison Lee and Gede Putra Kusuma Negara
Description: We present a system to create mobile interactive learning trails. Thesystem includes a web portal running on the Amazon cloud server for people without programming skill to create trails for outdoor fieldtrip learning, andtwo universal apps for iOS and Android phones respectively to run different learning trails. It enables rapid and easy creation of learning trails within15 minutes without mobile app development. The learning contents can be customised by teachers, and activated by snapping pictures from physical Objects of Interest (OOI) or entering a geographic area. Image recognition technology is used to identify which OOI that the picture is captured from, and return relevant contents pre-associated with the OOIs.

3) The social & mobile learning experiences of students using mobile e-books
Authors: Jeff s. Kissinger
Description: This research was designed to explore the learning experiences of state college students using mobile electronic textbook (e-book) readers. The purpose of the study was to build a rich description of how students used e-books delivered on mobile computing devices for college-level, introductory sociology courses at a public state college in the southeastern United States. This research employed a multiple case study design that investigated and documented student experiences with this instructional technology. The bounding frame was comprised of the literature on mobile technology, mobile learning theories, and e-books. A theoretical lens of learning theories commonly found in the literature on mobile learning (constructivism, social cognitive theory, self-efficacy theory, expectancy x value theory, self-determination theory, and situated cognition) was situated within the mobile learning framework. The theoretical lens was used to provide insight to the student's learning experiences.

Six conclusions were drawn from the study:
a) Students expressed competence in their use of the mobile e-books,
b) Students expressed feelings of high self-efficacy when using the mobile e-books,
c) Students valued the use of the mobile e-books for their learning,
d) Students were individualized and metacognitive in their learning with the mobile e-books,
e) Students enhanced their learning socially and within situated learning opportunities, and
f) The students and the instructor had divergent views on the value and utility of social, interactive textbooks.

4) Face Recognition on Consumer Devices: Reflections on Replay Attacks
Authors: Daniel F. Smith, Arnold Wiliem and Brian C. Lovell
Description: Widespread deployment of biometric systems supporting consumer transactions is starting to occur. Smart consumer devices, such as tablets and phones, have the potential to act as biometric readers authenticating user transactions. However, the use of these devices in uncontrolled environments is highly susceptible to replay attacks where these biometric data are captured and replayed at a later time. Current approaches to counter replay attacks in this context are inadequate. In order to show this, we demonstrate a simple replay attack that is 100% effective against a recent state-of-the-art face recognition system; this system was specifically designed to robustly distinguish between live people and spoofing attempts such as photographs. This paper proposes an approach to counter replay attacks for face recognition on smart consumer devices using a noninvasive challenge and response technique. The image on the screen creates the challenge, and the dynamic reflection from the person's face as they look at the screen forms the response. The sequence of screen images and their associated reflections digitally watermarks the video. By extracting the features from the reflection region, it is possible to determine if the reflection matches the sequence of images that were displayed on the

screen. Experiments indicate that the face reflection sequences can be classified under ideal conditions with a high degree of confidence. These encouraging results may pave the way for further studies in the use of video analysis for defeating biometric replay attacks on consumer devices.

5) Student Oriented Mobile Based Examination Process
Authors: Prashant K Gupta, Manvi Madan, Kajal Puri, Abhishek Gulati
Description: The industry that has been benefitted the most by the developments in VLSI technology is that of mobile phones. Modern day mobile handsets are referred to as smart phones and have reached to the hands of every person even in the remote corners of the world. Yet another revolutionary research was the development of the Android open source mobile OS which has made the mobile phones smarter. So, we decided to develop a mobile based examination system to reach the population even at the most remote areas. An Android driven examination system that we have designed and implemented is made with an intent to serve the education industry and provide efficient and reliable result along with powerful user interface. Our system aims at making the examination system a lot more convenient for the students as well as the faculty members and reducing the manual headache required in the traditional process. Google's Android is the most popular OS globally including India [2]. Android being so popular can be considered an OS that the masses have used in their smart phones; hence our system is designed considering the convenience of the faculty and the student taking the examination. Using the impeccable UI functionalities that have been provided using the Android Development Kit we have designed and implemented our system.

4. Existing System

The examiner Engine fixed in Moodle is not built based on Service Oriented Architecture. It is implemented as a bulk of PHP code which has to be access through standard web browsers that are a bit slow on mobile devices and cannot address the exam security issues that exist in m-learning environment. Moodbile services extension to Moodle does not touch the Moodle's Quiz Engine. Thus, we need to develop a new Quiz Engine that can be deployed as a service leaning 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 integratable with Moodle/Moodbile in order to have a complete which suites the mobile environment and addresses all of its security issues.

Disadvantages of Existing System
a) Does not provide security.
b) Not based on Service Oriented Architecture.

5. Proposed System

This aims to recognize various vulnerabilities that may violate assessment safety in M-learning setting and to deal the suitable security armed forces and countermeasures that can be put in put to make sure exam safety. It also aim to integrate the resultant secure exam system with an obtainable, open source and widely conventional Learning Management System and its service extension to the m-learning environment, namely "the Mobile Project". To design a Secure Exam Management System that meets the different security requirements of m-learning environments and to integrate it with the current Moodle/Mobile platform. This will end in an entire LMS that's each equipped with secure examination services and appropriate for m-learning. Our intention of integration SEMS with a well known LMS like Moodle is therefore to induce the advantages of Moodle's readymade services in different learning aspects like course material administration, documentation, etc. which contain been experience and valued for the last 15 years. However, the proposed SEMS can also work as separate secure exam management system for m-learning environment without integration with Moodle. The system highlights the benefits and future challenges of mobile learning in our educational environments in both online and offline mode. In proposed system ,the system will detect & capture the face of the candidate & it will be send to the admin, if candidate cheats, during the exam then system will terminate the exam and send a message on candidate's mail.

Advantages of Proposed System:
a) It has a Service Oriented Architecture.
b) Provide better security.
c) Can be access more lightly.

6. Algorithm

Advanced Encryption Standards:
AES is associate iterated symmetrical block cipher, which suggests that:
- AES works by repetition an analogous printed steps multiple times.
- AES is a secret key encryption algorithm.
- AES operates on a fixed number of bytes

Natural Language Processing:
NLP is the set of techniques that allow computers to extract actionable, structured meaning from unstructured, natural human language. Extracting the that means of associate unstructured phrase, paragraph, sentence (or of a book, website, blog post, etc) is a very complex and potentially intensive task for a computer. The that means might dissent counting on variety of things, like words used, context, domain, and more.
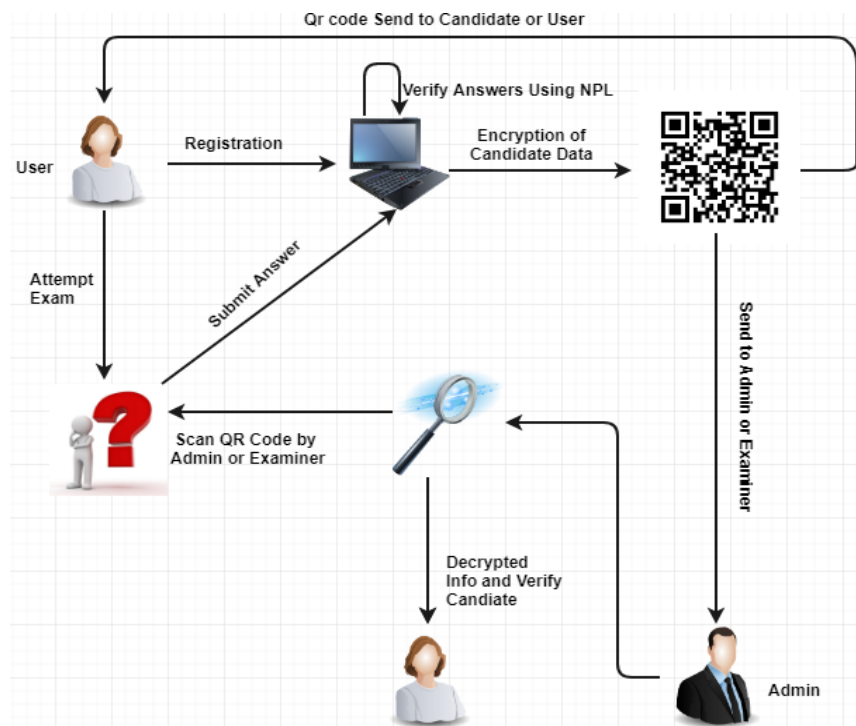
a) Block Diagram of System

Figure: Block diagram

a) Hardware Requirements
i.   System   : Pentium IV 2.4 GHz.
ii.   Hard Disk   : 40 GB.
iii. Ram   : 256 Mb.

b) Software Requirements
Operating system: Windows XP Professional/7LINUX.
Coding language: JAVA/J2EE.
IDE   : Eclipse Kepler
Database   : MYSQL

7. Application

This system is used in any organizations (hospital, bank) for security and authentication
It reduce paper work

8. Conclusion And Future Scope

This paper has mentioned the advance and need of the M-learning for the area education. The system highlights the benefits and future challenges of mobile learning in our educational environments in both online and offline mode. It produce the association between education and technology doable. The learner includes peregrine, institutional, home, kids and adult users and also the form of learning environments includes networked, internet-based, distance, cooperative, synchronous and asynchronous can arise the interest of the new generation of distance learning The paper has mentioned the background and the way it is wont to expand the full learning system utilized by varied students. The paper conjointly provides highlights of the advantages and also the future challenges in our instructional environments. Finally, our learners, students and academics ought to be ready for consecutive generation of coaching and learning. It is wont to solve the standard learning system

issues by the user. Each students and teacher would love a handy and proper system to act with each other and facilitate the teaching system. This system don't seem to be specifically to switch ancient school rooms however they'll be helped to enrich the training method in our faculties, schools and universities. We used NPL for verifying the answers. The system will detect & capture the face of the candidate & it will be send to the admin, if candidate cheats, during the exam then system will terminate the exam and send a message on candidate's mail.

9. Mathematical Model

Let 'S' be the set of whole system i.e. S= {IP, PRO, OP}.
Where,
- IP is the set of inputs given to the system.
- PRO is step or techniques applied to the system.
- OP is outcome of the system.

1) **IP = {U, QR, K, Q}.**
Where,
- U will be the user.
- QR will be the QR generated from users details.
- K will be the secret key to decrypt the encrypted QR code.
- Q will be question paper.

2) **PRO = {R, C, QRCode, K, Q}**
Where,
- R will be registration phase.
- C will be number of candidates.
- QRcode will be generated for every candidate and sent to candidate Mail ID.
- K will be secret key.
- Q will be question paper generated by administrator.

Process
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 a 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.

3) OP= {Output}
Secure Exam Management System (SEMS) to mitigate the unique exam security threats that exist in m-learning environments.

10. Acknowledgment

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