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

Abstract:

M-Learning has enhanced the e-learning by making the learning process learner-centered. 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. In such environments, students can easily exchange information over the network during exam time. This paper 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 exam security. It also aims to integrate the resulting secure exam system with an existing, opensource and widely accepted Learning Management System (LMS) and its service extension to the m-learning environment, namely “the Moodbile Project”.

Existing system:

The expansion of mobile devices, meanwhile, is providing new ways to learn (mobile learning or mlearning). The 2015 Horizon Report mentions that Bring
Your Own Device (BYOD) learning technology is expected to be increasingly adopted by institutions in one year’s time or less to make use of mobile and online learning. Forecast of the number of smartphone users for 2019 is 5.6 billion globally which is three times that for 2013. Thus, LMSs must change to adapt to new user requirements and technologies. For 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.

**Disadvantage :**

- Lack of teacher confidence, training or technical difficulties with mobile devices.
- Lack of institutional support.
- Interoperability problems with LMSs.
- Security and privacy issues.
Proposed system:

In Proposed System we the proposed SEMS a standalone secure exam management system for mlearning environments without integration with Moodle.

The paper is organized as follows: Section 2 presents the core services and functionalities of SEMS Exam Engine. Section 3 introduces SEMS Security Agent that enforces the dynamic network access control on students’ mobile devices.
during exams. Section 4 discusses various network issues that can affect the exam process. Section 5 is on SEMS integration with Moodle/Moodbile framework. Finally, Section 6 presents a survey conducted about SEMS.

**Advantages:**

- SEMS is integrated with an open source and widely accepted LMS, namely Moodle and its Moodbile service extension.
- The resulting design is a complete LMS with secure exam services that can be consumed by legacy systems through web browsers as well as by mlearning systems.
- Finally, a survey conducted reveals that overall attitude of students and teachers towards SEMS is very favorable.

**Conclusion:**

This paper proposes the design 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 distribution of exam questions, turbo-mode assessment, prevention of the “unattended exam” issue, biometric-based authentication service for antiimpersonation, preventing students from exchanging their devices during an exam, conducting exam securely through online or offline strategies, and auditing. The paper also provides countermeasures against various network related issues such as network...
overload, occasional network failures, students attempting to use alternative mobile devices to exchange information during an exam, and an intruder using a Wi-Fi jammer to bring the Wi-Fi network down.

Hardware Specification:

- System: Pentium IV 2.4 GHz.
- Hard Disk: 40 GB.
- Floppy Drive: 44 Mb.
- Monitor: 15 VGA Colour.
- Mouse: Logitech
- Ram: 512 Mb.
- MOBILE: ANDROID

Software Specification:

- Coding Language: Java 1.7
- Tool Kit: Android 2.3 ABOVE
- IDE: Android Studio
Reference:


