

# Chapter 23

## Designing Ensemble Based Security Framework for M-Learning System

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### ABSTRACT

*Mobile Learning has a potential to improve efficiency in the education sector and expand educational opportunities to underserved remote area in higher learning institutions. However there are multi challenges in different altitude faced when introducing and implementing m-learning. Despite the evolution of technology changes in education, unfocused issues are security management even though statistically proven; threats are increasing each day on mobile application and ensemble devices. In order to provide a secure guideline for m-learning platform, an ensemble based security framework for mobile learning is proposed and improved. One of the major benefits in the framework is it integrates the security with dependability to provide trustworthiness in learner and providers perspective.*

### INTRODUCTION

At present, higher learning institution in Malaysia and global has well adopt the e-learning concept and now the new revolution in learning technologies has given a big bang towards rapid growth in mobile learning(mlearning) environment. In near future wireless and mobile application has become

a very famous technology among the 21<sup>st</sup> century generation. Mlearning capabilities will continue to grow with the introduction of smaller, more sophisticated and powerful gadgets capable of delivering data in a variety of format anywhere, at any time.(Schooler, Jelinek, & Dahle, 2010) In the mid of enhancement in the global economic developing countries has also continued to ex-

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plore in widening their education system where continues learning environment has put into the lime light of proposing to mobile learning

In recent Asia Pacific Future Gov Online, Educational IT article by Gou (2011) stated University Sains Malaysia has created a mobile learning research team and as a future planning of the research team is to propose to the Ministry of Higher Education; to extend the Mlearning method to all universities as the cost is much less compared to the conventional methods. ("SEAMO RIHED ANNUAL REPORT," 2007) report of the 2nd Meeting of Director General/ Secretary General/ Commissioner of Higher Education in Southeast Asia hosted by Malaysia has put focus on several areas, which one of it is E-Learning and Mobile Education Program. The meeting has notified that importance of lifelong learning programs in the region especially open learning activities such as e-learning and m-learning. They have requested for a paper to be presented in collaborative efforts by Malaysia, Thailand and Indonesia on M-Learning that address the possibility in developing general platform in delivering methods. Furthermore m-learning and security are among the expected services in ubiquitous computing. Global user expectation and initiative taken in wireless and mobile technologies is towards ubiquitous computing. (Bhd, 2008) Under the Malaysian Government transformation initiatives and plan, MyICMS886 strategy has focused to three main niche area. One of it is Growth which points out areas in ICT and Education Hub, Communication Devices, embedded component and device.

Another major issue in m-learning system is implementation of secure and trusted system. This is an essential requirement in m-learning applications and systems where sharing information is needed. The system should prevent data losses or corruption due to network disconnection and mobile failures. At present security tools are adequate for securing systems on small scale but most security breaches are caused by faulty and ad-hoc software. To rely on a learning system, learners

need to know to what extent it can be trusted. Providers of M-learning need a guided platform to introduce and implementing a secure mobile learning system in their organization. To overcome the drawbacks associated with m-learning system and ensemble computing, it is essential that m-learning system must have an integrated security framework, which offers different security techniques to provide an overall secure system. As a solution to be a successful provider and meet universities business management aim, m-learning should be highly secured and implemented in a trusted environment for the learners.

In line with this issue there is an urgent need for framework that can be used to analyze and evaluate trustworthiness of m-learning system where both security and dependability can be measured. According to the project report by Steering Committee for European Security & Dependability Task Force under the Sixth Framework Program 2002-2006 in the Issue 1.0 (Technologies et al., 2010) mentioned that as the digital world grows in larger size and become more complex dependency impacts all aspects of personal and public, social and economic activity. There is a greater need to concentrate attention and effort on design and implementation of components in the aspect of interrelationships between security and dependability

## **LITERATURE REVIEW**

Since mobile learning is a new paradigm of a new networking structure with mobile and wireless technology, according to Alaysia (2010) the confusion that happened by using the unnecessary functions on the current e-learning system can be solved by implementing learning processes using mobile devices. Mobile applications and devices are likewise booming and becoming the fastest growing consumer technology. However mobile applications security is severely lacking and the security issues are present on all major

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