Privacy Preservation in Mobile-Based Learning Systems: Current Trends, Methodologies, Challenges, Opportunities and Future Direction

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Abstract. The adoption of mobile technologies in education are evolving like in the business and health sectors. The design of user-centric platform to enable individuals participate in the activities of learning and teaching is currently area of research. The Learning Management Systems (LMS) area assists learners and academic activities but, it continues to fall short of desired impact due to huge demands of the application. More importantly, the mobile applications offer enormous convenience not without the possibility of eavesdropping and maliciously exploiting data about users. The original structure of mobile learning requires that data and processing heads have centralized entity, which is not possible in wireless application arrangements due to communication overhead of transmitting raw data to central learning processor. This led to the use of distributed mobile learning structure, which preserve privacy of learners. This study discusses the challenges, current trends, methodology, opportunities and future direction of privacy preservation in mobile-based learning systems. The study highlighted the use of learners' private data and behavioral activities by LMS especially in understanding the needs of learners as well as improvement of their experiences. But, it raises concerns about the risks of learners' privacy on LMS due the mining processes of learners, which were not considered in existing related studies in literature.

Keywords: Mobile Learning, Mobile-based learning system, Privacy Preservation, Learning Management System developers.

1   Introduction

The LMS have been adopted by higher level of education (such as universities) in order to improve the practice of educators and learners, and provides learning management functionalities for these institutions [1]. One concern features prominently, which is the protection of the privacy of users. The problem of privacy continues to attract the attention of users and developers. Third parties find easy to determine actions, transaction consummated, traffic data, and location information of users for potential security and privacy compromises [2].