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Delivering e-Learning Contents through Mobile Technology: UNITEN Case Study

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Abstract: E-learning had become more affordable with a cheaper but faster Internet connection. This has encouraged more applications beyond conventional e-learning technique including mobile learning. This paper presents a working prototype of SMS-based mobile learning system which allows interactive learning contents be delivered and disseminated to students using mobile phone application was developed at University Tenaga Nasional (UNITEN). Challenges and issues related to the deployment of SMS-based application are also discussed.

Keywords: e-Learning, mobile technology, short message service application

1. Introduction

Mobile communication provides enriching, enlivening and adding variety to conventional lessons or courses [5].For instance, Attewell [1] reported that many learners who taking part in mobile learning class enjoyed the opportunity of using mobile devices in their learning sessions. While mobile learning is regarded as the new promising learning paradigm; adaptation of this learning approach into Malaysian community must be done carefully [6]. One of the potential drawbacks to the success of the implementation of mobile learning approach is the delivering technology [10]. We still lacking of the develop country IT infrastructure especially the very critical broadband services (blue tooth, and WIFI) [6]. Thus, it warrants the need to study the best suitable delivering method that suits Malaysian environment. Thus, an exploratory survey was conducted amongst students of Universiti Tenaga Nasional (UNITEN) to study their perspective on mobile learning using SMS technology. There were 55 unpaid students of UNITEN involved in this study. They represent student from various degree levels, different degree program (Engineering background and IT background students). Results from the survey indicate that very significant percentage (83%) of respondents agree that using SMS to obtain information related to their study and life in university was more effective and convenient. Based on results, we develop a working prototype of SMS-based Mobile Leaning System (SMLS). The prototype allows students to request various information related to their subject such as class schedule, download assignment and obtain their assessment marks.

2. SMLS Design and Implementation

Figure 1 below shows the architecture of the SMLS prototype which uses a third party SMS gateway service. The third party SMS gateway has unique number known (shortcode) and provides the application programming interface between the SMLS and the service provider's SMS centre. The shortcode is then referred by SMS Centre of mobile service provider for routing the SMS message to the respective SMS Gateway. An example of SMS sent by a user is

```
sms2u cseb324 notes adam@yahoo.com.my.
```

After processing the string, SMLS will return a string as below:

```
0,60123456789,CSEB364%20notes%20had%20been%20sent%20to%20adam%40yahoo.com.my.,30
```

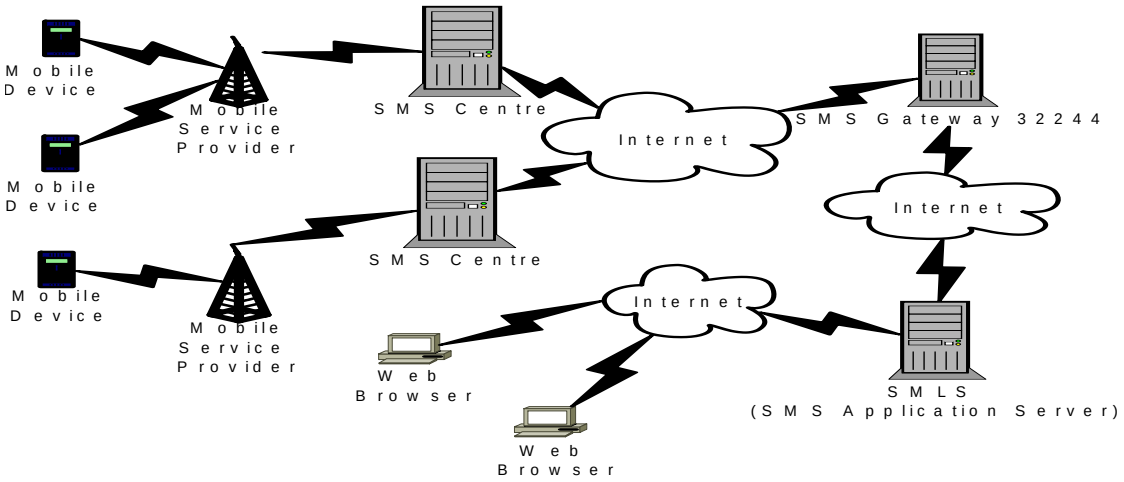

Figure 1: SMLS System Architecture

3. Result and issues of SMLS

SMLS has been implemented for CSEB324 Data Structure and Algorithms class in UNITEN for a semester. Through SMLS, student can request notes and updated schedule of the class. In addition, lecturer can send prompt message to inform his students about any updated on class activities or class notice. Although SMLS works as planned, there are several issues that need to be highlighted.

3.1 Reliability and performance issue

Based on the SMLS architecture, it depends so much on several servers – the service provider SMS Centre and the SMS gateway server before it reaches the SMLS server. It means, the availability and performance of SMLS is much depends on the performance and availability of both servers. During the trial, sometimes the Gateway server took longer than 15 seconds to reply for a SMS message. In some isolated cases, the reply even failed to reach the user. The problem was due to the unreliable network connectivity between the third party SMS Gateway and the service provider SMS centre. We propose two solutions to this problem. First, university can choose a better and reliable third party SMS gateway that can offer reliable services. However, this simple option is only a short term solution. A better option is for the university to setup its own SMS gateway server. Although the initial setup cost is expensive, the university can recoup its investment from the charged imposed by the service provider to the user.

3.2 Cost of implementation issue

Since SMLS is using a third party SMS gateway, cost of sending SMS message is charged at a premium rate with minimum of RM0.30 per message. This amount is on top of standard SMS rate imposed by the respective service provider. As such, students with financing constraint were a bit reluctant to use the system, unless they have no choice. To address this issue, several steps could be done by the respective party. About 40% to 60% of the of the SMS premium charges goes to the service provider. Whatever remains will be shared between the third party SMS gateway and the content provider (in this case the university). If the university owns the gateway server, almost half of the cost can be subsidized by the university. Furthermore, the mobile service provider could play their role in reducing premium charged for education purpose as part of their corporate social responsibility project.

4. Conclusion

SMLS was developed with the intention to enrich student learning experience with a very minimal infrastructure – a hand phone. However, we acknowledge more research and work need to be done to improve the system. Thus includes the ability of the SMLS to send more complicated content such as multimedia content. It is hoped that this project will not only generate new knowledge to us, but will also provide a new learning paradigm as it could improve students' learning interest and eventually contribute to the improvement of their performance

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