

## A STUDY ON THE USAGE OF SHORT MESSAGE SERVICE AND ITS ENHANCEMENT IN LEARNER SUPPORT AT THE FACULTY OF NATURAL SCIENCES

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### INTRODUCTION

The Open University of Sri Lanka (OUSL) differs from the other universities in the method of teaching and learning being Open Distance Learning (ODL) catering to a wider section of learners all over the island. Integration with the latest technologies has apparently improved its programme delivery system. Maintaining frequent and effective communication channels between the staff and the learners play a major role in improving the individual motivation and performance of the learners.

Accordingly, the Faculty of Natural Sciences initiated the Short Message Service (SMS) as a learner support tool under the technical guidance of the Department of Mathematics & Computer Science (DMCS) in the year 2009, as a supplement to the other learner support methods.

This study consisted of two major phases. The objectives of the first phase were to:

- i. Analyze the usage of SMS in the faculty of Natural Sciences for the past three years.
- ii. Carry out a survey to obtain the Learner/Staff responses on the existing and future SMS as a learner support tool.

The objectives of the second phase were to:

- i. Study on new SMS gateways (Free/Commercial) available, in order to identify a gateway that supports the improvements needed by the faculty.
- ii. Installing and configuring the identified SMS gateway.
- iii. Study on SMS front-end software available in order to identify a front-end that supports the SMS gateway selected and the implementation of the improvements.
- iv. Develop new improved features on top of the identified SMS gateway and front-end software.

### METHODOLOGY

In Phase I, two independent questionnaire based surveys were carried out in order to obtain the learner and staff responses on the existing SMS, which provided necessary data to conduct a statistical analysis on user views, requirements, and preferences related to the service. Questionnaires were sent to 193 Learners and 73 filled questionnaires were returned while we received 34 responds from the staff among 76 questionnaires sent to the staff. In addition, the data available in the department by providing this service for the past three years were also used.

Based on the fundamental faculty requirements, in Phase II, an investigation was carried out to find an alternative possible software to replace the presently used *BulkSMS 2.0.61* ("Bulk SMS", 2010), which is a standalone software with a major limitation of providing only one-way communication and no database connectivity. Accordingly, the built-in facilities of such possible SMS gateways were examined and tried out. In parallel, a technical feasibility study was carried out by comparing the features of *BulkSMS 2.0.61* with other new Open source SMS gateways with respect to the hardware requirements, software requirements and user

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involvement to examine an SMS gateway which supports the faculty identified improvements. Consequently, the most suitable new SMS gateway software to be used was identified. In addition, a study was also carried out to find a suitable front-end software to be used between the end user and the SMS gateway, on which the improvements were developed. A set of new features related to the learner support activities were designed and technical developments were carried out. These newly developed features were integrated into the identified SMS gateway and the front-end software. Finally, a prototype of the newly developed system was tested with sample end users (*i.e.* 08 learners and 02 academic staff) by simulating the actual environment of sending/receiving trail SMSs on different new uses as listed in page 03.

## RESULTS AND DISCUSSION

### Utilization of SMS over the past three years in the faculty

The analysis revealed that a total of 96 short messages have been communicated to a total of nearly 6000 learners on different learner support activities. Figure 1 depicts the total utilization of SMS among the six departments while the Figure 2 depicts the trend of utilization of SMS within the faculty.

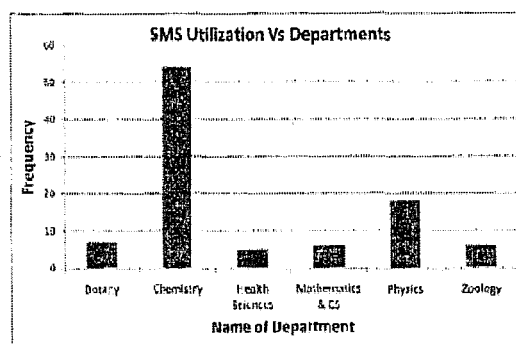


Figure 1: Utilization of SMS among departments

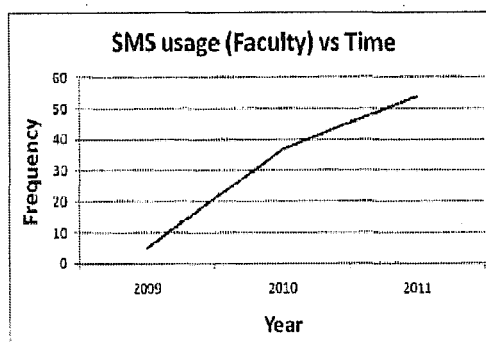


Figure 2: Trend of SMS utilization in the faculty

Though the utilization of the service was very low at the introduction stage it has been largely used in the latter periods. However, the service has to be more popularized within the departments except the department of Chemistry.

The departments have used the service for different types of major learner support activities with the frequency percentages as shown in the Figure 3 below.

### Learners' responses on the existing and future SMS

Analysis of responses received from learners revealed that documentary methods such as Prospectus, Activity schedules, Notice boards, and Paper notices, were the major source of information to the learners (38.7%) from the faculty. The rest of the responses were on other learner support types namely face-to-face discussions (33.4%) and electronic media (27.9%) which included SMS. The actual SMS usage as a learner support method was found to be as 10%. However, the service being accepted as reliable and efficient by the learners, 85% of the message receivers involved in the survey say that the SMS has mainly helped in planning their activities in numerous ways.

At the analysis of the preference of 15 different learner support methods, SMS has obtained the highest frequency (25%) of preference by the learners to support their activities. 60% of the learners were of the view that SMS was *Very Effective* and 38% say that it was *Effective*. Thus, only 02% were of the view that SMS was *Not Much Effective* and *Not Effective*, in comparison with the other learner support methods.

It was found that 31% of the learners were willing to obtain their examination marks through the service. Hence, sending of Continuous Assessment Marks (CAM) via SMS was considered as an improvement and incorporated into the service. The learners' levels of interest on some of the other improvements are depicted in the Figure 4 below.

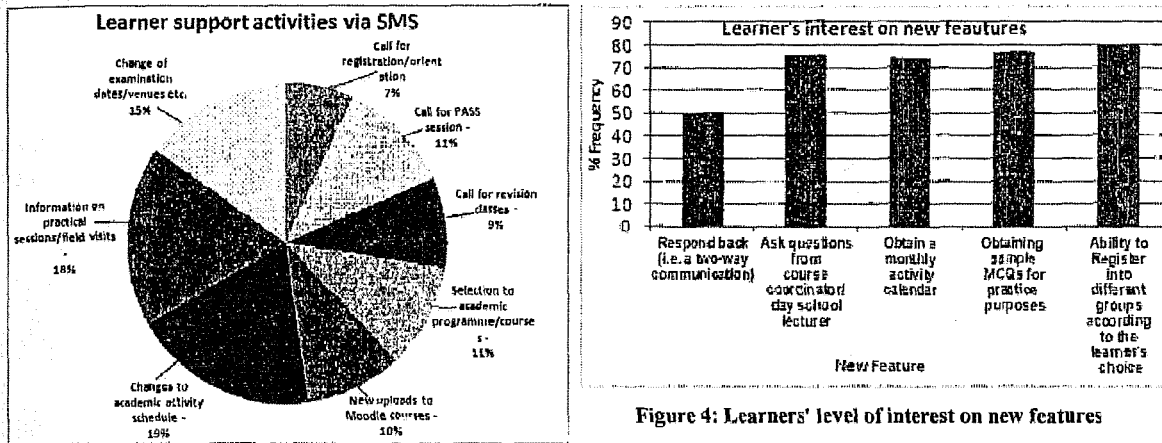


Figure 3: Past usage of SMS for learner support activities

Figure 4: Learners' level of interest on new features

**Academic staff's responses on the existing and future SMS**

Out of the entire staff respondents, 88% are in the view that SMS would be a major learner support method irrespective of whether they have utilized this service earlier or not. 78% of the staff have expressed that they require this service for the courses coordinated by them.

The fact that only 12% of the staff has the electronic copies of the mobile phone numbers of learners which are collected by individual coordinators manually at day school lectures/practical classes appears to be the major reason for the existing service not being utilized by the academic staff. However, 91% were willing to use it for informing the changes of the schedules of the course activities.

Following are the new features that had been identified as the major improvements to the existing service from the questionnaires filled by the academics. The Figure 5 below illustrates to what extent the said features had been accepted as improvements to the service.

- a. Handling MCQs via SMS
- b. Sending a monthly activity calendar.
- c. Assigning students into different groups (Eg. Practical groups) according to their choice (Group size limiting facility is not available)
- d. Receiving replies into a department folder/e-mail from a group of students.
- e. Entrusting a user from each department to send their own short messages.

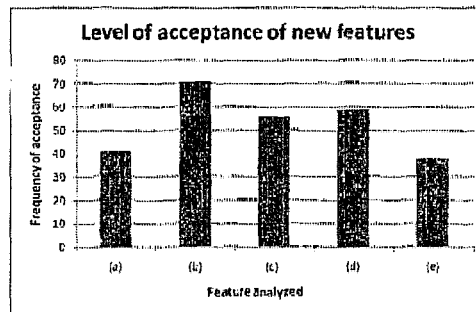


Figure 5: Acceptance of new features of SMS by academics

**An alternative SMS gateway and SMS managing software**

As a result of the study carried out to identify a suitable SMS gateway software ("SMS application", 2006), (PawelKot, 2009) a set of four SMS Gateways were investigated namely *Kannel*, *SMS Server Tools 3*, *Gammu 1.31.0*, and *Clickatell*. Accordingly, *Gammu 1.31.0* (Michal, 2011) was found to be acceptable to replace *BulkSMS 2.0.61*, since it supports database management systems such as MySQL, PostgreSQL, and SQLite which enabled addressing the majority of the identified fundamental requirements while supporting the implementation of major improvements to be done. Further, an SMS management application was built by developing new plug-ins for the freely available front-end software named *kalkun 0.4* which acts as the interface between the SMS gateway and the user (see Figure 6).

At this selection, two SMS front-end software viz *PlaySMS 0.9.5.3* (Raharja, 2011) and *Kalkun 0.4* ("Kalkun", n.d.) were investigated and *Kalkun* was found to be more user-friendly and it has also been recommended by *Gammu*. The enhancements implemented on top of the *gammu* and *kalkun* are Decentralizing the authority and privileges on using the SMS among the departments, Learner registration to use SMS, Provide learners with their CAM, activity schedules, and early reminders relevant to the courses, Assigning learners into different groups, and Receiving replies into a department folder/e-mail from a group of learners.

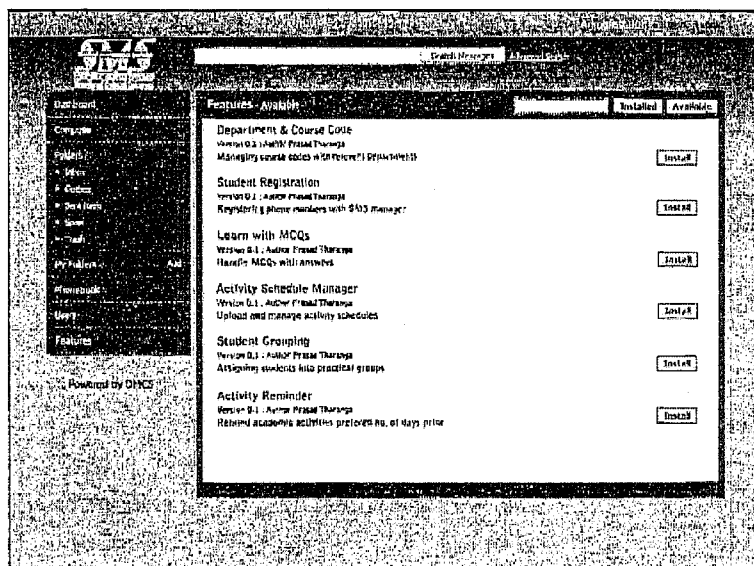


Figure 6: Administrator interface of SMS management application

## CONCLUSIONS/RECOMMENDATIONS

Results of surveys showed a high motivation towards the utilization of SMS as a learner support methodology among both learners and staff of the faculty. The technical enhancements done have resulted a new SMS by addressing the existing limitations and improvements required found in the study. Future enhancements such as catering voice messages and linking this entire service into the currently used Learner Management System of OUSL will be beneficial.

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