

Learning Messages Notification System to Mobile Devices*

*M. Lourdes Jiménez** University of Alcalá, Spain*

Abstract: The work presents a new method to send educational messages in e-learning systems. The communication tools are one of the main characteristics of the virtual formative actions, in addition of the contents and the evaluation. The system must help to motivate the students, mainly those who do not leave the formative action and continue it until the end. The system will be an extension of the communication tools, which are incorporated in all LMS (Learning Management Systems). The main idea is to spread to everybody (students or professors) implied in a course, any change or new situation. For example, a change in the contents of the course, publication of the examination dates, new schedules of tutorials, the qualification of an examination, proposal of new exercises, etc. It is, any event related to the virtual course that can be notified with a message. The students will receive the educative messages in their mobile devices: phone or PDA (Personal Digital Assistant). The messages will be of SMS (Short Message Service) type.

Key words: mobile learning LMS mobile devices

1. Introduction

In our society the new technologies are being very common; these technologies can be applied to education. The e-learning systems are the best example to show these applications. According to the European Commission, e-learning can be defined as the use of new technologies and Internet to improve the learning quality making easier the access to resources and services, and also the interchanges and collaboration in distance (EC, 2001).

In e-learning systems we can distinguish several elements. In concrete, we can enumerate three basic elements, which are, the own personnel implied in the course: professors/tutors and students; the didactic context composed at the same time by the contents of the course, the communication tools and the criteria or methods of evaluation; and the last element is the infrastructure and data processing management, what is known as a LMS. (Mir, 2003).

The communication tools are a basic characteristic for the dialog among the participants of a course. It can be differentiated two communication tools types: the synchronous tools, where the creation, transmission and reception of the information is produced in the same moment, for instance, telephone, chat and videoconference; the asynchronous tools, where the creation and reception of the message is produced in different times, for example, postal mail, e-mail, forums, etc.

By other side, the increasing use of mobile devices is common. Nowadays, we are not able to imagine any professional of any working environment without a mobile telephone or with no PDA. In the latest nineties, the use of the mobile devices started to be used for the learning formative actions, so a new kind of learning called "Mobile learning merged". Mobile learning is learning that is mediated via mobile technologies such as mobile

* This paper is presented at 4th International Conference on Technology in Teaching and Learning in Higher Education on July 11-13th, 2005 in Beijing, China.

** M. Lourdes Jiménez, assistant professor, Computer Science Department, University of Alcalá; Address: Computer Science Department, University of Alcalá, 28871, Alcalá de Henares, Madrid, Spain.

phones, personal data assistants, handhelds, wearable devices (Birkbeck, 2005).

In this moment we should ask ourselves, why not to extend the communication tools to the mobile devices? Now it is obvious many students have a mobile device. The fact of implying the mobile devices in the formative process can be interesting to obtain a greater degree of interaction in the course communications.

2. Activate System

The messages notification system will be a module that will be incorporated in DETIS – Distance Teaching Internet System – which is a departmental LMS. This system allows the messages transmission to the students' mobile devices to inform them about any new event related to the course they are carrying out.

The student or professor who wants to use the messages notification system have to activate it at first; to active it will be necessary to download, from the DETIS LMS server, and to execute in a mobile device a java application, midlet, based on the J2ME technology (J2ME, 2005). The midlet is a java application that conforms to the MIDP (Mobile Information Device Profile) standard; the java application will activate the messages system for that mobile device.

3. Messages System

Once it is activated and depending on the profile – professor, student or administrator – the system will notify through messages of SMS type any event that happens in the course. For the third profile – administrator – it will not be necessary for its activation because the administrator only receives messages related to the correct running of the system.

3.1 Students Messages

The systems will inform the student about the following situations creating the respective messages to these situations:

- About the inclusion of new contents or changes in the contents of the course.

About the inclusion of exercises or auto evaluation tests.

- About the inclusion of the final exam data.
- About the inclusion of the date of chats, forums, etc.
- About the inclusion of timetables.
- About the inclusion of the delivery date of homework.
- About the inclusion of the qualifications of an evaluation exam.

These situations can change; they can be modified or extended creating new types of messages. In general, the system will announce about any situation that can be notified with a SMS message.

3.2 Professor Messages

The professor will receive less messages types than the students; there are only four different situations possible:

- About the inclusion of tutorial timetables.
- About the auto evaluation exams statistics: percentage of failed students, percentage of passed students, minimum and maximum punctuation, etc.

- About those questions or doubt without response in the communication tools of the LMS, for example, forum, chat, etc.
- About the results of the students' inquiries about the teachers of the course.

3.3 Administrator Message

The administrator will only receive a type of message associated with the following situation: when there is a failure or a problem in the system.

4. System Architecture

The system, developed by the Computer Science Department of University of Alcalá, is in phase of design and it is anticipated that for the next course it will be working inside the DTIS. Figure 1 shows the basic architecture of the Learning Messages Notification System.

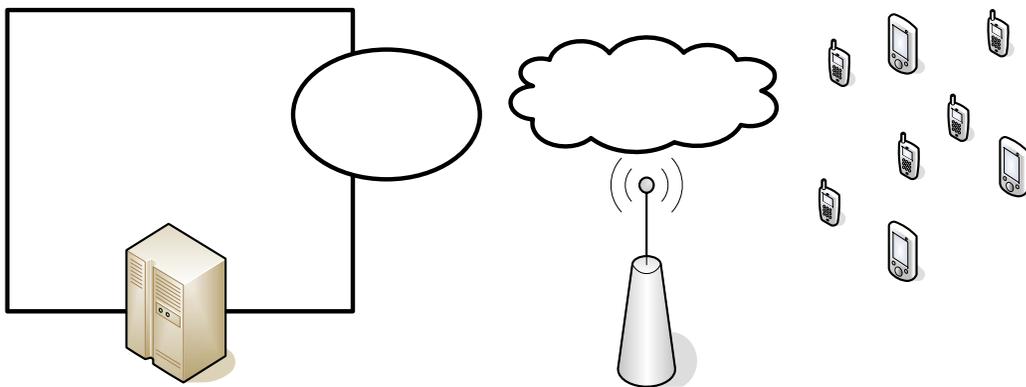


Figure 1 System Architecture

The students will receive the educative messages in their mobile devices: phone or PDA. The messages will be of SMS type (Short Message Service) which is a wireless available service in the mobile digital network, and it will be used the WMA, Wireless Messaging API (Application Programming Interface), of Java language for the activation process previously commented. This API provides a way of access to the applications to be able to receive and to send messages and it is based on the GCF (Generic Connection FrameWork), therefore the work environments will be the J2ME (Java 2 Micro Edition Wireless ToolKit).

The basic element of the architecture is DTIS, since once the users have been activated, which is responsible for requesting to the Learning Messages Notification System the transmission of a concrete type of message to the mobile device. The message will be sent through a PC card modem wireless with access to GSM (Global System for Mobile Communications) and GPRS (General Packet Radio Service) which are two international standards that allow the mobile communications without wires. The modem allows to send and to receive quick text messages. Finally, the students or professor only will have to open and read the educational message received in their mobile device and to set in motion.

Besides, the JSP (Java Server Pages) and Servlets technologies of the Java language will be used in the construction of DTIS to ask for the messages transmission to the notification system which dialogs with the wireless modem.

In Figure 2 it is shown the welcome screen to DTIS in its version of the year 2004 (Barchino, 2005).

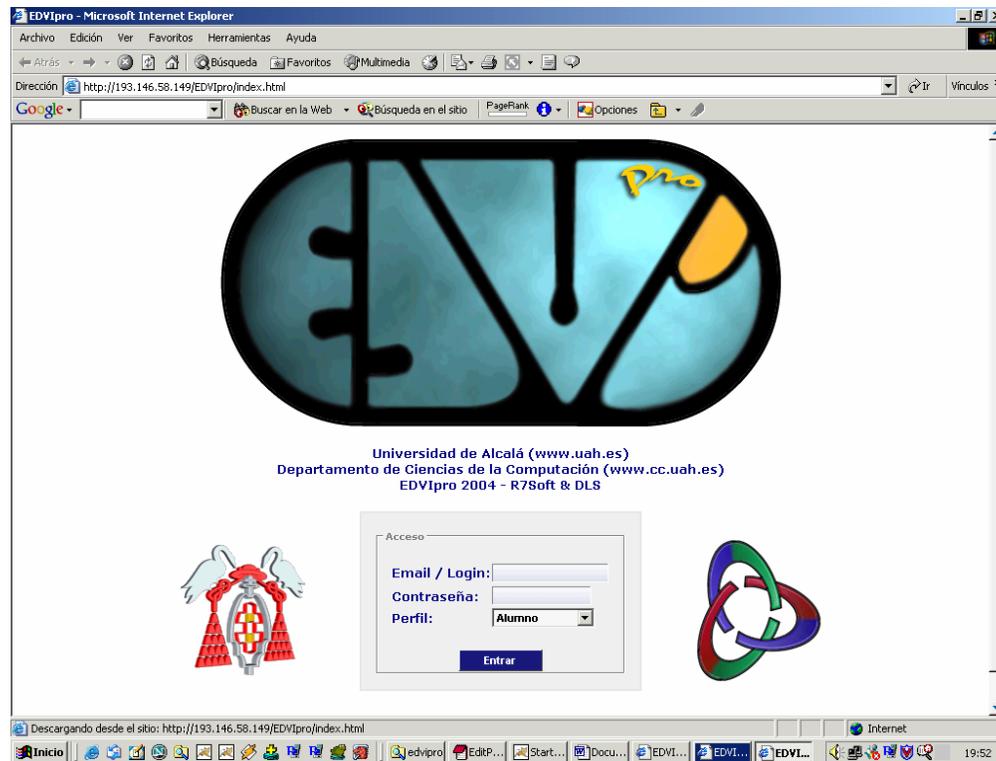


Figure 2 Welcome Screen

5. Conclusions

This work presents the first step, design, in the construction of an educational messages notification system, to extend the tools of communication that any commercial LMS disposition. This is possible thanks to the implementation of DTIS. The investigation and work with a departmental LMS allows us to test different aspects that with a commercial LMS it would not be possible. The increasing use of the mobile wireless communications makes very interesting the use of this technology to improve the learning. In future it would be very good that any LMS had this communication type and thus to expand the possibilities of communication among the different actors of a formative action. The future, in this environment, comes together with the Mobile Learning, which is the use of mobile wireless devices for learning on the move.

References

1. EC. European Commission (2001). http://europa.eu.int/comm/index_en.htm
2. Mir, J.I., Reparaz, C. et al. (2003). *La formación en Internet. Modelo de un curso online (1rd ed.)*. Barcelona. Spain: Ariel
3. Birkbeck. (2005). *University of London. Glossary of Terms*. <http://www.bbk.ac.uk/ccs/elearn/glossary.htm>
4. J2ME. (2005). *Java 2 Platform Micro Edition, Wireless Toolkit*. <http://java.sun.com/products/j2mewtoolkit/>
5. Barchino, R., et al. (2005). *An Example of Learning Management System*. IADIS Virtual Multi Conference on Computer Science and Information Systems MCCSIS 2005

(Edited by Saihu Xu, Li Shen and Ping Hu)