# An Example of Application in Mobile Learning Technologies[*].

Roberto Barchino[1], José María Gutiérrez[1], Salvador Otón[1], José Javier Martínez[1], José Antonio Gutiérrez[1], José Ramón Hilera[1], María Lourdes Jiménez[1] and Carmen Pages[1]

[1] Computer Science Department, School of Computer Science. University of Alcalá 28871. Alcalá de Henares, Madrid. Spain

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{roberto.barchino, josem.gutierrez, salvador.oton, jo-
sej.martinez, jantonio.gutierrez, jose.hilera, lou.jimenez, car-
mina.pages}@uah.es
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**Abstact**. In the present society of the knowledge it is undeniable that the use of the mobile devices is increasing highly. Also the use of these devices in different disciplines has increased and new areas of investigation have been created, for instance the new educational paradigm called "Mobile Learning" which is the use of mobile devices in the learning process.

This work proposes a model of communication with mobile devices; based on the implementation of a LMS - Learning Management System - denominated EDVI, developed by the Computer Science Department of the University of Alcala. In the model it is presented the basic and necessary components to implement a communication system among a LMS and the different kinds of users with mobile devices.

In addition to the model an application to study appears. In this application the student through a mobile device, a telephone or a PDA, can activate and use a reception service of educational messages of SMS - Short Message Service - type related to the course or lesson that the student is carrying on. This application is made through Learning Mangament System EDVI, where the messages are managed and these messages can be of different types, also the tutor of an specific course can create new types of messages.

## 1 Introduction

The Computer Science Department of the University of Alcalá, has been working since year 2000 in e-learning systems environment. As a result of this work, we want to highlight the construction of a Learning Management System which has been called EDVI [1] and, also to emphasize as a result the organization of relevant events,

some of them have been the I International Conference on Ubiquitous Computing: Applications, Technology and Social Issues [2] and V Jornadas sobre Programación de Dispositivos Móviles- MobiGame [3].

The increasing used of mobile devices is getting very common. Nowadays, we are not able to imagine any professional of any working environment without a mobile telephone or with no PDA – Personal Digital Assistant –. In the latest nineties, the use of the mobile devices started to be used for the learning formative actions, for this reason it appeared a new kind of learning called "Mobile learning". Mobile learning is learning that is mediated via mobile technologies such as mobile phones, personal data assistants, handhelds, wearable devices or laptops [4].

## 2 Educational Messages Services

The service, is an extension of the communication tools which are incorporated in all LMS. The main idea is to spread to everybody – students or professors – implied in a virtual course, any interesting change. For example: a change in the contents of the course; publication of the examination dates; new schedules of tutorials, the qualification of an exam; proposal of new exercises, etc. In fact, any event related to the virtual course that can be notified with a message.

The users who want to use the system will have to activate it at first, and to make it they will have to download from the LMS a java application called midlet which is based on the J2ME (Java 2 MicroEdition) technology, and also to execute that midlet in a mobile device. The midlet is a java application that conforms to the Mobile Information Device Profile (MIDP) standard; this java application activates the Learning Messages Notification System for that mobile device.

The activation is composed by three steps: the first one, in which the user connects to the LMS server from a mobile device; the second step is where the user downloads the midlet from the LMS; and the third step, the midlet that has been downloaded is executed, then the midlet asks some information to the user and the answers are sent to the LMS server.

The messages are SMS type (Short Message Service), which is a wireless available service in the mobile digital network, and it will be used the Wireless Messaging Application Programming Interface (WMA), of Java language for the activation process previously mentioned. This API owns 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 J2ME, Java 2 Micro Edition Wireless Toolkit. The messages are sent through a PC card modem wireless with access to Global System for Mobile Communications (GSM) and General Packet Radio Service (GPRS), which are two international standards that allow the mobile communications without wires.

The traditional architecture of the Learning Management System is extended due to the addition of the necessary elements to register mobile users in the system

and to send SMS to them. Figure 1 shows a diagram which represents the architecture.

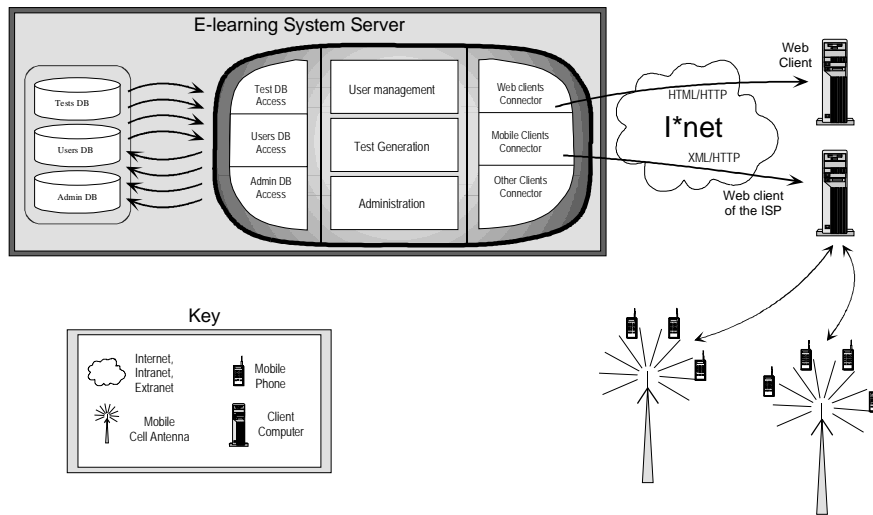## Learning messages notification system architecture



**Fig. 1.** System Architecture.

The modem allows to send and to receive quick text messages. The modem which has been used in the system is Sony Ericsson GT47/GT48 [5]. It is an intelligent and versatile GSM/GPRS control terminal that encapsulates everything needed for wireless M2M – Machine to Machine – capability in a compact unit. Alternatively, it can be used as a stand-alone and powerful GPRS modem with its intrinsic TCP/IP stack.

Once it is activated and depending on the profile – professor or student –, the system can work and send different types of messages. The system will inform to the students about the following situations: New educative contents, Change in the educative contents, Final exam data, Qualifications of an exam, Timetables, etc. The professor will receive the following messages: Tutorial timetables, Assessment statistics: percentages of failed students and percentages of passed students, E-mails without response in the LMS, etc.

These types of messages can be changed or modified for creating new types of messages if it is necessary for the right work of the system. Finally, the students or professor will only have to open and read the educational messages received in their mobile devices and to set in motion.

# 3 Conclusions

In the present Knowledge-based society the use of the mobile devices is, currently, very common. Therefore, the experiences and works which are being carried out by different institutions (Universities and Organizations), that incorporate the mobile technologies in our society.

The communication tools are a basic characteristic for the dialog among the participants of a virtual course. Why not to extend the communications tools to mobile devices? 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.

The system must help to motivate the students, mainly those who do not leave the formative action and continue it until the end.

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