How to design, create and use an e-Learning WebMail system in a Virtual University
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Abstract
The UOC, in English, Open University of Catalonia, is a completely virtual university founded in 1995. It currently has more than 54,000 students and offers 20 official undergraduate degrees as well as several graduate programs. UOC’s virtual campus is an integrated e-learning environment with an integrated webmail that allows students to pursue their studies completely online except for final exams, when appropriate.

The virtual Campus is the principal learning environment and meeting point for the UOC community. An attractive and dynamic user friendly environment, where the student follows all the teaching material, regardless of your time Schedule and accessed from anywhere.

At the UOC virtual campus students will find all the necessary academic resources to carry out their activities in an environment that can be personalized. You can plan your course at the UOC virtual campus. Communicate with classmates and teaching staff. Access all the necessary resources or check the calendar for assessments and submissions along with academic papers.

Moreover, the virtual Campus has an integrated webmail. This Webmail incorporates special features that have not got the rest of conventional webmails, as message’s history, to promote a feedback student-professor and vice versa: when the professor read your message, for sample, and to have a certificate (date and hour) of the delivery practices with a term. This history is a pillar of confidence in our University.

In this paper we describe the process of design, create and use of our webmail and our Virtual Campus.

Keywords
WebMail, Virtual Campus, e-Learning, SOA, LMS, OKI

Introduction
The Open University of Catalonia (UOC) is an online institution. There are no face-to-face classes. Students and teachers interact only through a Virtual Campus. Teachers encourage students to go through the subjects of study with constant assessment. Students at the same time follow a continuous evaluation, so they send to teachers frequent assignments.

The learning’s base is its Virtual Campus, a university campus that can be accessed anywhere, anytime, with no physical barriers. In fact, a campus that student can carry in their pockets!

Inside we found our new Webmail, necessary to communicate students and professors. In February of 2009, we completed the new Webmail of UOC. This new Webmail system was necessary to advance the e-learning education and incorporate special features, that has not got the rest of conventional webmails, as the message’s history, to promote a feedback student-professor and vice versa: when the professor read your message, for sample, and to have a certificate (date and hour) of the delivery practices with a term. This history is a pillar of confidence in our University.

The system has installed using Java, and soon will be able for the Community as software free. In this paper we describe the process of design, create and its use, using a new technology highly compatible with different platforms standards of eLearning. The WebMail uses ideas and technologies of Campus Project.
Developing usable interfaces

Since the beginning of the UOC, in 1995, the Virtual Campus has an integrated web mail. This webmail, due to his age (15 years), is outdated in interface and technology.

On the interface, we want that system evolves towards a modern and flexible web mail. To do this we decided to apply usability methods, which are now mature enough now and the results are contrasted to apply to the construction of new interfaces. So, you get a usable product that is efficient, effective and satisfying for the user.

Several empirical and inspection methods exist for designing and evaluating interfaces. We decided to focus on empirical methodologies and more specifically we used the development of personas, interviews and iterative user testing. For this reason, to develop the project we adopted a process UCD (User Centered Design), which provides three major phases: Requirements Gathering, Design and Evaluation.

Our initial task was to analyze UOC’s statistical information to help us build user profiles. We decided to use this method because we consider user archetypes as a key factor in usability processes as well as a powerful design and communication tool. However, and as opposed to Cooper’s method, we believe that the persona creation process should involve both quantitative and qualitative information. From our initial analysis consisting of 200 surveys, we obtained three user profiles: the practical woman, the visionary man and the avid woman. We then conducted user interviews for a qualitative validation of these personas.

The user profiles were the basis for the recruitment screening for the two rounds of user testing. We decided to run ten user tests per persona, a total of thirty users. Although several authors proclaim that testing with fewer users is enough to find most usability problems, we also benefited of the possibility of observing more students using our materials given that the effort required to test more users is not much higher.

For the user tests, we decided to use a hi-fi prototype of the materials where students could reproduce the way they work with interactive materials. In order to select the tasks that would show us the way students use the course materials, we defined user scenarios based on the three personas developed. Each user profile had different goals when using materials and the accomplishment of these goals defined the tasks for the user test. The quantitative data from our web logs were also a source of information for the creation of the set of tasks and supported our conclusions.

For our portable usability laboratory we used Morae software. With this software we captured a video image mixing the PC screen and the student’s face. At the same time Morae can save all clicks and keyboard actions in a file. For the analysis of our tests, we took into account the number of clicks and the time needed to accomplish the task. Simultaneously, the users were observed and their expressions and comments noted to support the test results. These tests results were also shared with a multidisciplinary team of observers whose work was a key factor in this project. Specifically, the team was formed by two developers from the IT department, two persons from the content management group, one pedagogue, one psychologist and one graphical designer.

The observers’ analysis of both the interactions and observations recorded was the basis for the interface improvements, and with their recommendations a new prototype was built, to run a second set of user tests. The results of the second iteration showed an improvement of more than 50% from the first set of tests.

In the first phase, we analyzed our current webmail (to register bugs and doesn't do them again), then we did a benchmarking of external webmail (Yahoo, GMail, Hotmail, etc.) to collect the best aspects of each and finally, a series of interviews with some 40 professors from the University to gather information they needed and how that affected the old version.

Once end the first phase, we follow in the DCU process and we entered into an iterative process between the remaining two phases: Design and Evaluation. First, we did a series of wildframes (models). We made available them at a number of users, to interact with them and assess the findings were used to modify these wildframes who returned to be evaluated by users. Thus, iteratively, to achieve a final product that was to be implemented.
In the time of implementation, as we emphasized at the outset, the second aspect to evolve in the mail was their technology. The old technology was based on an implementation in C++ and it was to evolve into a technology standards-based Java J2EE.

The implementation of the Campus's Webmail follows a client-server model, in which the binary implemented in C++ client plays. Cluster Server is implemented in Java Mail. The connection between the two layers is performed via CORBA.

The new webmail has followed the same architecture as the new development, only affects the client side (the binary Campus) has passed from C++ to be implemented in Java. Also at the presentation layer has been no change and we must use a JSP Using HTMLs allow flexibility mayor. Also have added the latest AJAX technology and jQuery to achieve a dynamic mayor of the interface.

Special mention has been devoted to the Accessibility and Usability, to remake the presentation layer again, as we have discussed, we applied methodology usability and accessibility worked under regulations to ensure that all displays and comply with W3C WAI standard AA, except for javascript, which we are working.