

## **MEDIA CENTER: FIRST STEP TOWARDS A CROSS-PLATFORM AND CROSS-CHANNEL E-LEARNING SYSTEM**

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### **Summary**

*New technologies allow for providing information through cross-platforms simultaneously, highlighting the potential that have digital television and new mobile devices. Media Center and Silverlight technologies allow for sharing the same content in all these platforms and open a wide de range of possibilities for delivering information to geographically disperse users who can use different devices to get access to it. Mobility is becoming a new trend of the ICT user and this concept considerably alters the scenario of information technologies and, as a result, affects the management systems of the teaching and learning processes.*

*Traditionally the creation of educational content based on various channels has come across the limitation of high production costs that its adaptation and conversion leads to make them usable anywhere. On the one hand, using Silverlight technology for producing it will enable this limitation to be overcome as it permits the same development to be used, visualise and interact with the content on the different television, mobile and computer channels. On the other hand, Media Center offers the possibility of publishing interactive content for free that can be accessed from TV. These technologies reveal an enormous usefulness for distributing multimedia content rich in video and audio.*

### **1. Introduction**

The idea that technology evolves at great speed is an opinion shared by all education professionals who work incorporating Information and Communication Technologies (ICTs) in this field, and this sensation can be summarised in the phrase “technology is moving fast”. This idea of speed and change is currently being emphasised by another variable: mobility. The introduction of this concept considerably alters the scenario of information technologies and, as a result, affects the management systems of the teaching and learning processes.

From the moment that the Universitat Oberta de Catalunya (Open University of Catalonia, UOC) was founded, the distance education model of the University has been technologically based on the web. The technologies known as Information and Communication Technologies are extensively used at the University both for managing as well as for constructing and promoting the teaching and learning processes of a distance education institution. However, today as well as internet and personal computers, new technologies

associated with other devices and platforms enable new educational scenarios to be considered. These technologies enable the distribution of information via multiple channels and platforms in a ubiquitous and instant way, emphasising the new potential that digital television and mobile devices – PDAs, 3G terminals, e-books, audiobooks, videobooks, etc. – add to the internet and PCs. New computer technologies also enable the same content to be shared on all these platforms and to be accessed from different devices, widening the range of possibilities for distributing the necessary information to disperse and itinerant users and to those with different means of access.

This paper will deal with the development of the UOC's Media Center proposal.

## 2. Elements of a cross-platform and cross-channel model

How does the introduction of a cross-platform and cross-channel factor effect the information management of an e-learning system? If we take a brief look back at the history of the web, we can see how the first sites to appear were static (HTML) and that the user could only consume the content. They could not interact with the information received other than to move between one static page and another. Later it evolved towards a model of dynamic content in which the information is structured (XML) and can be distributed in a personalised way to each user. They now had the opportunity to adopt an active role in the consumption of the information, as they could interact with it in a more versatile way. From this point different technologies for cooperation (Web 2.0), decentralisation (virtual desktops), and syndication (RSS) arose. In this phase, the role of the users changed from passive to active with regard to the information they consume via the web. They have the opportunity to become content generators on an individual or collective basis and are able to share the result of this content creation with all the web's users. We will focus on the syndication of content and RSS (Really Simple Syndication) which can be considered the first system that promotes and stabilises the development of technologies that modify the models of electronic information management in a significant way. The user no longer searches for the content (pull), instead the content finds the user (push). This transformation establishes the term "mobile information" used to refer to content that can jump from one system to another and which can be accessed from different devices according to a user's requirements at any given time. There is a growing trend to transfer all of a user's data and information to the web as a functionality of the classic desktop applications (e.g. Google Docs) which means that users are no longer dependent on a PC to be able to access information available on the internet or to process it, redraft it and share it with other users. In this new scenario the consumption of information via mobile devices and televisions with internet access will continue to increase considerably over the coming years. Indeed, Cisco has forecast that Europeans will consume an average of 18 MB of data per month by 2013. In this context of increasing consumption of mobile information, Cisco forecasts that the type of information that will experience the largest increase with regard to access and broadcast will be video content. This will be contributed to by the wider reach of broadband with sufficient quality to distribute video content and devices with improved video viewing features.

For this ubiquitous access, adapted to each and every circumstance and scenario, to be possible, the content has to be created and developed based on the following principles:

- **Cross-platform:** designed to be able to be run on different client platforms that enable end users to access and consult the content offered from anywhere. This is possible thanks to the support of SOA standards and to the accessibility via web browsers on any client platform.

- **Cross-channel:** one of the main differential advantages is its cross-channel orientation, given that accessibility is possible via three completely differentiated channels:
  - **Television:** the new possibilities of digital television and the expansion of information access technologies through conventional receivers enable access to what were exclusively computer technologies from the living room. The extension of the **Media Center** platform as a nerve centre for access to interactive video and audio content enables this content to be accessed from domestic televisions, equipped with this technology.
  - **Mobile:** the new generation of mobile telephones enables remote access to interactive content. The main new development on this platform is the possibility to access the same content without the need of technological adaptation and therefore at a lower cost.
  - **PC:** as the currently conventional channel for accessing interactive digital content, it also offers the possibility of accessing the platform via PCs and browsing its content.

Therefore, the content can be standardised, structured and syndicated. It can also be added to the same cross-platform and cross-channel layers so that they can be packaged and read via different channels (television, radio, web, etc.) regardless of the platform (Windows, Linux, Mac, Windows Mobile, Android, etc.).

To develop a content distribution platform that adapts to these characteristics there are two key elements without which its realisation would not be possible. In fact the appearance of these technologies is what enables the design and development of new scenarios for distant education based on ICTs that allow cross-channel distribution and multi-device access without having to adapt the content to each channel. These two technologies are: Silverlight and Media Center.

## 2.1. Silverlight Technology

Microsoft Silverlight is a multi-browser, cross-platform and multi-device technology that enables dynamic 3D interfaces to be created. It also naturally integrates video and audio on the web without the need for additional installed programmes. Silverlight is the natural evolution of Macromedia Flash, the current standard for interactive applications on the web. The main improvements with regard to Flash include the ease of development, better support on different platforms, more interaction possibilities and better performance in the download of content. Macromedia is developing the new Flex system as an alternative to the jump forward that Silverlight offers, however it is still currently in the predevelopment stage.

Traditionally the creation of educational content based on various channels has come across the limitation of high production costs that its adaptation and conversion leads to in order to be usable and work correctly on the different channels established. The use of Silverlight technology will enable this limitation to be overcome as it permits the same development to be used to visualise and interact with the content on the different television, mobile and computer channels. This means a reduction of costs and an increase in the means of access to the information.

Currently, various pilot experiences have been developed worldwide of the use of this technology for the implementation of new generation educational content. This enables text, images, hyperlinks, audio, video, simulations, tests and games to be integrated in the same educational material in a completely transparent way for the user. Most important is that this

integration can be carried out without high development costs as well as notably reducing the time necessary to produce content accessible from different end access devices.



An example of an educational application developed in Silverlight

For more information on Silverlight, its possibilities and examples, consult the following links:

<http://www.silverlight.net>

<http://www.microsoft.com/expression/>

<http://www.mono-project.com/Moonlight>

## 2.2. Media Center Technology

The other technology that provides a specific and essential aspect for this project is the innovative method of content broadcast for television known as Media Center, which is included in the Windows Vista operating system.

Currently the broadcast of interactive content by television is at a low level of development and expansion. In Spain some 40 Digital Terrestrial Television (DTT) channels are broadcast, enabling interactive services to be realised if a decoder compatible with MHT and a telephone line are available. Currently the expansion of DTT continues to progress but there are virtually no interactive services, both due to the small number of available receivers and the high cost of development or adaptation of applications and content and the subsequent cost that their broadcast.

As an alternative to this technology, solutions are being developed, created by the combination of PCs and televisions. More and more homes have Home Theatre PCs (HTPCs) or similar devices that offer direct or indirect access to all types of local or remote content. They are based on small silent computers or on bridges to the home's PC so that the whole wealth of content is available on the television. Among the projects that try to exploit this new possibility, the most advanced and extended is Microsoft's Media Center. It is included as a Windows Vista component meaning that 90% of computers sold over the last two years include it. Additionally, there are numerous compatible devices, known as extenders, which enable their content to be viewed on the television without the need of having a computer connected.

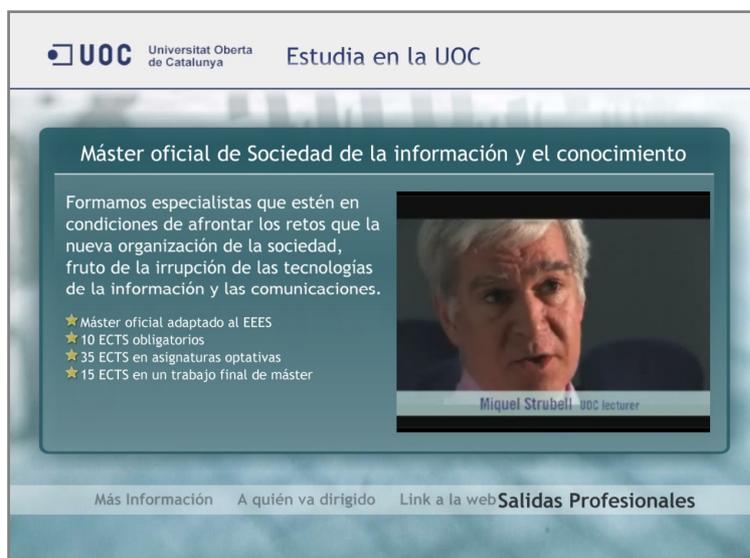
Media Center offers the possibility of publishing interactive content for free that can be accessed from a TV. These are known as Spotlights and are a service offered by third parties using this system via the internet. In addition, if this content is offered via Silverlight it becomes compatible with the rest of the platform's channels.

### 3. Media Center: the case of the UOC

Since the end of 2007, the UOC, in collaboration with Raona Enginyers S.L., has been developing the University's first Media Center prototype. In this first phase, information on the University and its extensive range of courses can be accessed via both a computer or a television simply using a remote control. Moreover, the University's news channel can also be accessed via the Media Center, enabling videos of institutional events in which the UOC participates to be viewed. Radio content involving the institution can also be broadcast.



Main menu of the UOC's Media Center



Example of the information on a master programme

The first user tests allow us to conclude that the Media Center technology provides great versatility and agility in viewing video content and in the access to audio content, as well as easy access to the information distributed via this platform. The potential that can be glimpsed with regard to the creation of interactive content such as simulations and educational games has led the UOC to commit itself to the thorough study of the use of these technologies in order to offer its students new education and learning scenarios that take advantage of this. Beyond the creation of this type of interactive content, which still needs a period of research and testing to guarantee its large-scale development, usefulness and profitability in distant education contexts such as the UOC's, the Media Center technology reveals an enormous immediate usefulness for distributing multimedia content rich in video and audio, in a ubiquitous and highly efficient way. The content design for distribution via this platform is based on the premise of their use and access using a remote control with features similar to the traditional television remote control. Therefore, viewing this content both on televisions as well as on advanced mobile telephones is easy and intuitive for all users. Having this technology available allows us to enrich the distant education offer that ICTs enable, in that it enables intensive use of moving image and sound as support elements or as a basis of learning processes in which these are necessary such as: learning of languages, training in the area of experimental sciences that require a high component of reality simulation or training in the area of social sciences.

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