e-iTV Multimedia System: Generator of Online Learning Environments through Interactive Television

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Summary

This document briefly describes a Multimedia System capable of generating Online Learning Environments (OLE), namely, educational websites, through an entertainment Interface as the Interactive Television. Also presented are the motivations for the development of the above mentioned System, the System functionalities, the system development environment, the conclusions and future work.

Palavras-chave

Interactive Television, iTV, online learning, web lessons, educational websites.

1. INTRODUCTION

The TV is one of the most marvellous technological inventions from the last century. In fact, functioning as a magic window, it may transport us to anywhere in the world whenever we decided, at the same time that it provides entertainment and information in a very direct way. With the constant technological advances, namely the improvement of communication platforms and the appearance of new forms of transmission, a new kind of TV appeared: the Interactive Television (iTV). The iTV allows the viewer to interact with an application that is simultaneously delivered (via a digital network) in addition with the traditional TV signal [Perera02]. Several types of services are possible and also different types and levels of interactivity. However, apparently what seems to remain clear in people minds is that iTV means the possibility to browse the internet using the TV set. In spite of a more recent phenomenon than the appearance of TV, Internet was also a brilliant invention as it renders access to information/entertainment easier for anybody, anytime and anyplace. Thus, we may say that the iTV technology achieved, by the integration of two privileged environments like TV and Internet, the creation of a new and very rich environment.

As for the characteristics of these environments, as because Information Technologies have become more commonplace in many areas, the traditional education system also had the necessity to adapt to this new society [Chambel03] and has benefited quite a lot from the contribution of these types of technologies/environments [Hartley99]. In fact, all of them became powerful learning tools: In the 60's the TV was used in a project called TeleSchool which consisted simply in broadcasting classes over the traditional TV network [Prata03]. In the 90's the Internet allowed Long Distance Learning (LDL) to evolve and turn into e-learning which can be defined as a teaching method, which utilizes Internet technologies to supply, by distance, a set of solutions, for the acquisition and/or updating of knowledge [Rosenberg01]. More recently, iTV is also being used in order to provide classroom's at a distance, that is, to allow a certain level of interactivity amongst students and teachers at a distance.

So it is proved that, at least in typical learning environments where the learners are, usually, in a conscious state of reflexive cognition and in a state of 'need to learn more or to learn something new', these environments work efficiently. However, people are not always in a state of constant reflexive cognition and yet there are moments in our lives when just that does happen, even when we are outside of a typical learning environment, such as, the classroom. In fact, simple quotidian things like exploring our mobile phone menus, listening to the radio or seeing a TV program, may, at some point in time, create reflexive cognition states. Everybody has, sometime in his or her lifetimes, felt the need to learn more about a certain something that, for instance, he or she was watching on TV or listening to on the radio. Unfortunately, until now, the only solution was to undertake some private research in order to satisfy that need. In fact, none of the above mentioned devices/environments is prepared to answer to this particular unconscious need of the user to know more about something and, based on that, prepare him a personalized lesson.

Thus, we decided to implement a Multimedia System capable of creating, (via iTV), Online Learning Environments (OLE), which are appropriate to respond to learning opportunities specifically created by iTV. Thus, the main goal of this work is to provide, via a reliable environment like Internet, an answer to the learning op-

portunities created by an entertainment environment like iTV. From a conceptual point of view, with this work we expect to understand the advantages, which will be the added value, of connecting those two environments.

The system will be briefly described to in this work, namely the several stages associated with its planning, its functionalities and its development environment. Some future developments are opinionated on.

2. SYSTEM

In order to briefly refer to the system's way of functioning, in general terms we may say that, while watching a TV program, the viewer will be able to tag, via a simple click, the specific issues in which, he or she, is interested in learning more about. At the end of the TV program, or whenever the viewer decides to interrupt it, a website with a personalized web lesson on all those tagged issues will be generated by the system, in a server, and be made available to the viewer, via the Internet. The viewer will receive an e-mail (default option), a sms, or both, with the web link to his/her online personalized lesson. That online personalized lesson will be prepared in order to be viewed in several types of devices, namely, computers, PDAs and mobile telephones. If asked by the viewer, the system will also be able to prepare that lesson in order to be viewed in the TV screen (through TV sites).

The more important is to achieve a user-friendly, easy to understand and intuitive interface. The interface will have to be the less intrusive possible in order to don't interfere and/or conflict with the TV viewer experience. As the system implies some interaction with the TV, because the viewer will be able to tag specific issues, and with the Internet, because the online lesson will be available via the Internet, we will, from this point forward, use more appropriate concepts and refer to the TV as iTV, and to the viewer as Viewer/User (V/U).

2.1 Planning

Planning the system was the first stage of this work, which phases are briefly described next:

2.1.1 Cognitive Patterns

The first phase consisted of a detailed study of the cognitive patterns associated with the environments (Internet and TV) and devices (computers, PDAs, mobile telephones and TV/iTV) to be used. This study was fundamental to help us understand the particularities of the aforementioned environments and devices, the pedagogical potentials and learning situations associated with each one of them, and to help us find the appropriate interface and adequate transition between them. We had to keep in mind that Internet on the computer means interaction and maximize user initiatives and empowerment, while Internet on the TV means integration with broadcasting without much V/U initiative [Nielsen97].

2.1.2 Type of Programs

There are lots of different categories/subcategories of programs, for instance: movies, documentaries, show, gamble, reality TV, Informative (daily journal, techni-

cal). As the state of mind, feeling, reflexive cognition state and way of learning, amongst other factors, varies according to what we are watching, we had to focus in just one category/subcategory. We choose the Information Programs, namely, the technical ones which the 2010 is a good example.

2.1.3 Functionalities

The proposed system will work integrated with the traditional Interactive TV, which specific way of functioning, concerning to the internet integration, may be resumed as follow: simultaneously with the program transmission, and every time that a link is detected, a bar appears in the bottom of the screen and remains there for 15 seconds (the so-called trigger bar). If the V/U decides to follow the link, that is to say, click on the trigger bar, he will have two different options: to see a screen only with text (the text related to that link) or to see a screen with the text but also with the video embedded (a small window of video). If the user decides not to follow that particular link the trigger bar disappear after 15 seconds. Every time that a link is detected a new trigger bar will appear on the screen.

The system proposed on this work will have the following steps and will functioning as described next:

- V/U validation and service choice: after activating the system, the first menu that appears on the TV screen will permit the V/U to login to the system and to choose the service that he intends to use. When a certain V/U is using the system for the first time he will be asked to fill an electronic form which will allow the system to define his profile. The form comprises data as gender, age, e-mail address, mobile phone number, the way in which the V/U wants to be informed about the online lesson location (e-mail, sms or both), amongst other data. After the conclusion and submission of the form the system will generate the V/U correspondent login and password. The login and password will allow the user to register and access the system.

Also on that first menu the V/U may choose the kind of service that he wants to use and which may be: 1) iTV; 2) Online Learning and 3) iTV & Online Learning.

Service 1: iTV, only allows the viewer to access the traditional interactive TV service, that is, the functionalities already described in the first paragraph of this subsection (2.1.3.).

Service 2: Online Learning, which is the focus of this work, will allow the V/U to activate the specific service already described on the first paragraph of section 2 of this work, that is, the V/U will be able to easily tag the issues in which he or she is interested in learning more about and, a website with a personalized lesson on those tagged issues will be generated by the system and be made available via the Internet.

Service 3: iTV & Online Learning, (already outside the scope of this specific work), will allow the V/U to use the previous described two services at the same time, that is, in some moments tag the program in order to see a web

lesson latter, and, in other moments of the same program, to follow the link immediately and interrupt the program. This type of service involves the use of more advanced set-up-boxes, namely, set-up-boxes with recording capabilities. Thus, if the user decides to follow a link in the middle of a program transmission, the set-up-box starts recording the program. This operation will allow the V/U to comeback latter to the right point of the program where he decided to follow a link.

- Finalization of Services 2 and 3: at the end of the program transmission, or when the V/U decides to interrupt it, the V/U will be conducted to the so-called "Services Finalization Screen", where he will see the list of tagged issues. On that screen the V/U will also have the possibility to: access the complete list of issues that may be tag and modify his own list of previous tagged issues by increasing or removing certain tags.

Also on that screen the V/U will have the possibility to change the way in which he will be informed about the online lesson location. The possibilities are: via e-mail (default option), sms or both.

Yet on the same screen the V/U will have the possibility to decide which device he wants to use in order to view the web lesson: a computer, a PDA, a mobile telephone or a TV set. In any case the lesson will be created and made available via Internet. However, and depending on the device that is going to be used, the online lesson will be prepared under completely different guidelines. If the V/U chooses to view his lesson on the TV he will be asked if he wants to see it immediately or latter. In both cases, and independently of the device that he decided to use, he will be informed via e-mail, sms or both about the exact location (address) of the website correspondent to the online lesson.

If, for some reason, the V/U turns off the TV without remember to access the "Services Finalization Screen" the system will prepare the online lesson, with the issues that he tagged until that moment. The system will inform the V/U about the location of the lesson using the default method defined in the V/U profile.

2.2 Development Environment
In order to develop the system (a prototype) some programs and programming languages are, simultaneously, being used:

- to edit the video files: the program Adobe Premiere Pro;

- to the interfaces development: the program Macromedia Director MX and the programming language Lingo;

- to the online lessons development HTML, DHTML e XML;

- to test the online lessons that are going to be viewed through the TV (the so-called TV sites): the Microsoft program Web TV Viewer;

- to the dynamic integration of the several components: the programming language PHP.

3. CONCLUSIONS
Important to mention that this work is part of a major project, namely, the phd studies of the first author. Thus, and considering that one of our major concerns was to obtain feedback from other professionals, the system functionalities were already discussed with some professional/experts in the areas of interactive television, educational sciences and human computer interfaces. Fortunately, the enthusiasm was obvious amongst the majority of them.

In relation to more specific data and as the prototype is already in an early stage of development, it was impossible to present more concrete results.

4. FUTURE WORK
As future works and after concluding our system (prototype), we will evaluate him with the participation of experts and eventual future V/U. After the evaluation process, we will try to adapt the interface of the system to other possible categories of programs. Another future work may be the study and development of an appropriate interface for service 3: iTV & Online Learning.

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