An Approach for Script-Based Broadcast Application Production

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Abstract. Digital television services are now available in various countries in Europe and throughout the world featuring applications such as Electronic Program Guide and Digital Teletext. Future applications will combine television, real-time data broadcast and eventually Internet access to offer value-added services and Electronic Commerce applications for the residential use. This paper discusses possible approaches to implement and to manage applications for enhanced digital television services which exploit the broadcast technology by adding interactivity and multimedia. A production system is described, which provides means to address the specific characteristics of the broadcast environment. The ideas presented in this paper stem from the experience gained during the ACTS IMMP Project.

Introduction

The target audience for applications designed for the digital television are residential users – an audience which is entertainment oriented and not necessarily experienced with computer applications. The viewing environment is the living area, the client devices are consumer electronics: a television set, with a digital television decoder and a remote control for navigation within the television programs and the application. This environment introduces specific requirements for the application production.

It is necessary to consider that the digital television technology is designed in the first place to provide television services – plain television viewing is the most prominent usage. The applications which are additionally made available via the digital television technology have to keep this paradigm, which has an noteworthy impact on the design of digital television applications: The navigation within the application should allow to change to full-screen television at any time, and the user has most likely the expectation to “be entertained” instead of taking an active role while viewing television. This pattern may change in the long run as the services evolve, moving towards increased user involvement. But the pattern remains valid for the vast majority of applications in short and medium time-scale. The applications need also to provide a very simple user interface, which can be controlled via a remote control. The graphical user interface should be intuitive and should not rely on complex user interface elements such as scroll-bars or pop-up menus. Ideally, applications are as easy to use as a telephone.
A classical application for the digital television, the Electronic Program Guide (EPG), fits very well into the outlined environment. An EPG is supposed to support the navigation within a large number of television channels by presenting a listing of available television channels. A typical EPG application displays the current and upcoming events in the TV stations schedule. Depending on the design of the EPG the user may be able to filter the offer according to preferences such as “news” or “movies”, to request additional information such as the headlines or a summary, or to tune to a selected television channel. The EPG information source depends on the systems design. The EPG may utilise DVB-Service Information, data broadcast, object carousel, or on-line connections via modem to access the television schedule information.

Another common application is Digital Teletext. This application relies on the object carousel to make the application data available on the client: the service provider inserts application data periodically in a carousel-like transmission mechanism to the DVB data stream. The client has to wait for the requested application part until it is scheduled in the carousel. This mechanism involves delays for the application presentation, but relieves the client from caching or complete application retrieval. It depends on the functionality of the client platform to which extent television viewing is integrated to Teletext applications: advanced platforms allow to control the video display as part of the application presentation.

The visual quality of the services offered by such applications depends on the technical capabilities of the client and the technology used for the application production itself. The functionality of the client is under discussion in various consortia and organisations such as DVB, ATSC, and AICI (see the reference list at the end of the paper). This paper concentrates on the production environment for the applications. The approach described here is not tightly related to a certain client technology. Instead, it aims to introduce an abstract application format which is mapped to the constraints of the concrete technology when needed.

The next section distinguishes between static, semi-static and dynamic applications. The authoring techniques and the suggested approach are described after this, together with a generic architecture for the application production. A conclusion and a list of references closes the paper.

## Application and Page Types

From an authors and broadcasters point of view, there are at least three different types of applications. The difference here is how they are produced and stored on the server. A page-oriented application design is assumed for the following considerations.

- **Static pages** are produced once and stay unchanged for a long time on the server. Help pages, introduction pages, or product information pages are examples for this type. They are produced once and are only updated when some of the information on a page need to be changed.
- **Semi-static pages** consist of a static and a dynamic part. For most applications, the static part defines the framework and the layout of the pages, but leaves room for