

# Interactive Services for Sports in Digital TV Based on DVB-MHP Standards

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The continuous transformation of analog systems into digital systems has marked the technological evolution during the last decade in the broadcast sector. It has allowed the introduction of new and different types of services as well as an increase in the quality of the services delivered. The possibility of sending digital information (data + applications) together with the traditionally broadcasted signal (audio and video), sometimes combined with a return signal via Internet, has opened a new field of research and application for Computer Graphics.

Most of the new delivered services are linked to the biggest satellite and cable digital TV platforms. Services like Electronic Pro-

gram Guide (EPG), interactive news services, interactive sports applications, telebanking, teleshopping, etc. highlight some of the possibilities that the new technology offers. Most of these services have been developed under proprietary platforms and can be considered preliminary attempts to exploit the huge commercial potential that is involved. However, there exists still a great need to fully exploit the real potential of this technology for interactive services.

Right now, we are experiencing the first broadcasting of digital TV that follows the European standard DVB-MHP (Multimedia Home Platform). It is hoped that this new situation will help the development of new interactive

## German Abstract

Zur Zeit erleben wir die ersten Ausstrahlungen von digitalem TV gemäß der europäischen DVB-MHP (Multimedia Home Platform) Standards. Es bleibt zu hoffen, dass diese Entwicklung vielfältige, neue interaktive Möglichkeiten, basierend auf systemfreien Standards, auf den Weg bringt. Bis dahin müssen allerdings noch einige Probleme aus dem Weg geräumt werden, wie etwa die auf dem Markt fehlenden Set-Top-Boxen für den MHP-Empfang. Die Implementierung der Standards erfolgt in den meisten Fällen nicht vollständig. Trotzdem scheint die Entwicklung vielversprechend. Im Folgenden wird ein interaktiver Sportservice vorgestellt, der von VICOMTech entwickelt wurde. Diese Anwendung wurde von den Sportsendung-Produzenten STT und G93 gefördert und vom EITB (dem baskischen Fernsehsender) unterstützt. Sie wurde gemäß der DVB-MHP Standards entwickelt.

The image shows a digital TV interface for a sports event. At the top, it reads 'CAMPEONATO MANOMANISTA PROFESIONAL 2002'. Below this is a red header 'Ficha de Mikel Atxa Iragui'. The interface is divided into two main sections: 'Datos personales' and 'Datos profesionales'. The 'Datos personales' section includes: Nombre: MIKEL, Apellidos: ATXA IRAGUI, Nacido el: 09/07/1976, and Nacido en: ALMANDOZ (NAVARRA). The 'Datos profesionales' section includes: Fecha Debut: 18/10/1998, Frontón: SANTESTEBAN, Tipo de Jugador: DELANTERO, and Palmarés: Subcampeón Campeonato de España Parejas (Afic) 1997, Subcampeón Liga Vasca Parejas (Afic) 1997, and Campeón Campeonato de España de Parejas 2° 1999. The background features a green-tinted image of a handball player in action.

Figure 1: Individual information for each user



Figure 2: Real-time information of the match.

acting as a transmitter of information, in addition to its function as receiver. This capability offers the user many possibilities, which range from applying for exclusive services to interacting with other connected users.

Without question this capability introduces a dramatic change both in the way television is understood and in the concept of spectator. It becomes the main character of the stream of information because its decisions alter the content.

Interactivity not only means that users can send their requests to the source of the broadcast. In fact, the return channel also becomes a connection to the Internet through which users can send and get data to and from everywhere. This connection becomes the definitive link between television and Internet. Users will have available all of the services the Internet offers, which till now have been exclusive of the PC environment at the same time as they enjoy television enhanced with new interactive services.

### Interactive Pelota

All we have previously described about interactive services and the Internet is in practice limited by existing technical restrictions both in the equipment needed and in the infrastructures used for development. Considering these actual

services on a broad scale, based on open standards. Many matters remain to be solved: lack of commercial set top boxes for MHP terrestrial reception, for instance or the fact that implementations of the standard are in most cases partial. Nevertheless, prospects are very promising.

For example, an interactive sport service (interactive pelota) that was developed at VICOMTech has been presented. This application has been promoted by the sports content producers STT and G93 and supported by EITB (the Basque TV Channel) and has been developed under the DVB-MHP standard.

offers the user more information, but in an à la carte way, so he does not receive extraneous information as happens currently. Second, and more important, it allows interactivity, offering the user the choice of changing the emission content at will.

Choosing only wanted information is not really »interactive« because all the information is being sent without listening to the user. Everybody gets the same information as a whole, but it is the user who makes his selection at home.

The interactivity is possible thanks to the return channel, which gives the user the choice of

### The Interactive Service

Interactive pelota represents a good example of interactive sport service for digital television. This application offers the user all the information already broadcast together with the sport event but with important differences. In the current emission the user has to wait for the information to be sent, which is shown periodically, without the choice of selecting information. Our application allows the user to apply for specific information at any time.

The application introduces two important differences: first, it



Figure 3: Motion tracking information in real time

limitations, VICOMTech is developing an interactive application for the pelota matches in television.

This application is fully compliant with the MHP standard, because it is developed with both its limitations and advantages. It provides the usual analogical emission, such as score, number of fouls, etc. The user can consult this information at any time displayed on the screen when he wishes.

In addition, the application provides exclusive services related to interactivity. Some kinds of information about the match might only be of interest to some users at a specific time. This might not be interesting to everyone. It is at this point that interactivity arises: for example, a specific user wishes to know about one player's performance in previous championships. When selecting this information, the user asks the broadcaster for information that is emitted just for himself.

The set-top box of the user, through its return channel, sends the user's request to the broadcaster, who inserts the requested information into the data carousel with a specific user identifier. This guarantees that the one who requested the information is the only one who gets it. This way, users are not overwhelmed by information of no interest to them.

Using this system, the application allows the user to interact with services such as requesting information about players, their sport careers, triumphs and defeats, predictions about their futures, information about the state of the championship this year and in previous years, etc. (Figure 1). Although this information is not qualitatively different from what has been received, it is a novelty that it is requested by a specific user and sent only to him.

The application also allows the user to participate in a survey, giving his opinion on who is going to win (interactivity), and

following the state of the survey in real time.

Nevertheless, the most novel characteristic of the application is the information in real time that is obtained about a match in progress. (Figure 2)

VICOMTech is also investigating adding the capacity to make motion capture, track players, and show the data in real time to the application. (Figure 3)

Once again, the bandwidth and set-top-box processing capacity limitations restrict advances in the applications.

It is important to mention the inherent difficulty in interactive applications development for television: the synchronization and speed of the emission. While watching television, nobody wants to wait 10 seconds to see what he wants on the screen. By contrast on the Internet, there is a certain tolerance towards connection delays. The information arrangement sent by the carousel must be maximized because there are approximately 500 Kb/s where all the information for everybody must fit. This is the challenge of developing interactive content for television.

Because it is a very demanding and technologically limited environment, serious problems, which are only the first obstacles to be overcome, have already arisen.

#### **Partners**

STT  
G93  
EITB  
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