Multimedia Communication Services on Digital TV Platforms

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INTRODUCTION

Digital television (TV)-based communication systems provide cost-effective solutions and, in many cases, offer capabilities difficult to obtain by other technologies (Elbert, 1997). Hence, many books and papers on digital TV have been published in recent years (Burnett, 2004; Collins, 2001; Dreazen, 2002; ETR, 1996; Mauthe, 2004; Scalise, 1999; Seffah, 2004; Whitaker, 2003). None of them, however, provide an exhaustive analysis of the service provision aspects at the application layer. Therefore, this contribution aims to fill that gap, with a comprehensive view on the provision of services on DTV platform.

MULTIMEDIA SERVICES ON TV PLATFORM

Digital video broadcasting (DVB) is a technology readily adaptable to meet both expected and unexpected user demands (DVB, 1996; Raghavan, 1998), and one can use it for providing bouquets of various services (Fontaine, 1997; Hulicki, 2001). Because it is still unclear exactly which multimedia services will be introduced and how the advent of digital technology alters the definition of the audio-visual media and telecoms markets and affects the introduction of new services, one has to consider a number of various aspects and issues dealing with the definition, creation and delivery of DTV services. Under consideration will be also a question of the possible substitutions of products and services which, previously, were not substitutable, and now result in new forms of competition.

Digital Multimedia TV Services

The advantage of the DTV (DTV) platform is the ability to provide a rich palette of various services, including multimedia and interactive applications, instead of providing only traditional broadcast TV services (Hulicki, 2000). To explore different services that can be provided via DTV systems, a generic services model is to be defined. This model will combine types of information flows in the communication process with categorization of services.

Depending on different communication forms and their application, two categories of telecommunications services can be distinguished on DTV platform, broadcast (or distribution) and interactive services (see Figure 1). These categories can be further divided into several subcategories (de Bruin, 1999); that is, the distribution subcategory will include services with and without individual user presentation control, while the registration, conversational, messaging and retrieval services will constitute a subcategory of the interactive services.

The interactive services will be the most complex, because of numerous offerings and a widely differing range of services with flexibility in billing and payment (Fontaine, 1997°). However, based on the object and content of services, some of them will refer to multimedia services, whereas the others will continue to be plain telecommunication services (see Figure 2). On the other hand, depending on the content's economic value, some of these services may be provided via conditional access (CA) system and will constitute the category of conditional access services. A CA system ensures that only users with an authorized contract can select, receive, decrypt and watch a particular TV programming package (EBU, 1995;

*Figure 1. TV services categorized according to the form of communication*
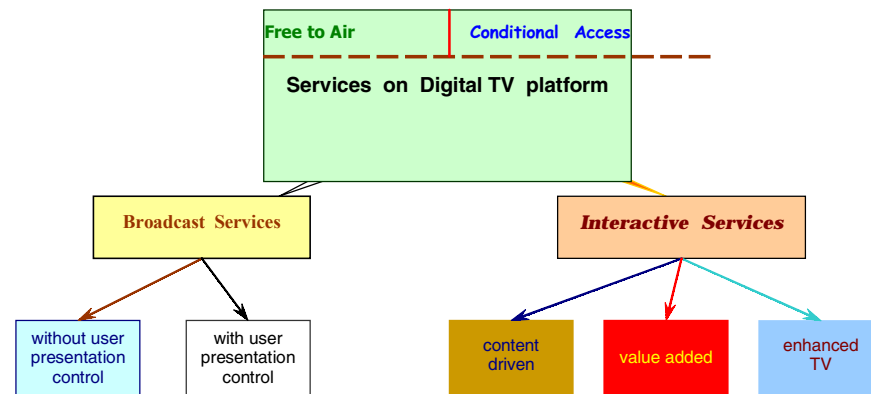
Lotspiech, 2002; Rodriguez, 2001). None of the networks currently in operation gives the possibility of providing all these services, but DTV seems to have a big potential for this (Hulicki, 2002).

The traditional principle of analog television is that the broadcaster's content is distributed via broadcast network to the end user and, with respect to these kinds of services, television can be considered a passive medium. Unlike analog, DTV enables more than the distribution of content only; that is, it allows a provision of interactive multimedia services. This implies that a user is able to control and influence the subjects of communication via interactive network (ETSI, 2000) (see Figure 3). Even though the user is able to play a more active role than

before, the demand for interactive multimedia services continues to be unpredictable. Nevertheless, as the transport infrastructure is no longer service dependent, it becomes possible to integrate all services and evolve gradually towards interactive multimedia (Tatipamula, 1998; Raghavan, 1998).

The functions required for service distribution are variable and can be addressed in accordance with three main parameters: bandwidth, interactivity and subscriber management. The services to be developed will have variable transmission band requirements according to the nature of information transmitted (voice, data, video), the quality of the transmitted image and the compression techniques employed (Furht, 1999). On the other hand, these technological

Figure 2. A generic service model on DTV platform
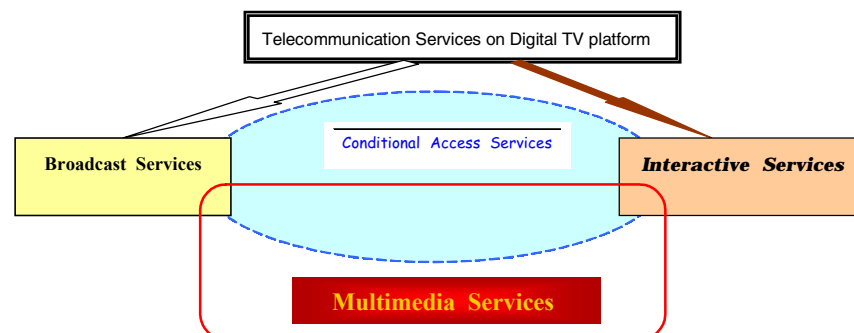
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