Digital Video Broadcasting (DVB) Evolution

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INTRODUCTION

Achieving widespread access by all European citizens to new services and advanced applications of the information society is one of the crucial goals of the European Union's (EU) strategic framework for the future. Towards realizing this primary target, multiple access platforms are expected to become available, using different access methods for delivery of services (and of related digital content) to a wide variety of end-user terminals, thus creating an "always-on" and properly "converged" technological and business environment, all able to support and to promote innovation and growth (Commission of the European Communities, 2005). The result will be a "complementarity" of services and markets in an increasingly sophisticated way.

Economic and technology choices imply certain networks for certain service options. As these networks become more powerful, the temptation is to adapt certain characteristics of the network technology to make it suitable for modern services. The challenge is to build "bridges" or "links" between the different convergent technologies without undermining the business models on which they are built. In such a context, converging technology means that innovative systems and services are under development with inputs, contributions, and traditions from multiple industries, including telecommunications, broadcasting, Internet service provision, computer and software industries, and media and publishing industries, where the significance of standardization and interoperability can be fundamental. In any case, digital technology can offer the potential for realizing the future electronic information highways or integrated broadband communications. However, for the multiplatform environment to proliferate in liberalized markets and for the platforms themselves to complement each other, the related prerequisites and the governing regulatory environment must favor technologically neutral conditions for competition, without giving preference to one platform over others (Chochliouros & Spiliopoulou, 2005a).

Among the latest European priorities for further development of the information society sector as described above were several efforts for extending the role of digital television based on a multiplatform approach (European Commission, 2002a). If widely implemented, digital (interactive) television may complement existing PC- and Internet-based access, thus offering a potential alternative for market evolution (Chochliouros, Spiliopoulou, Chochliouros, & Kaloxylos, 2006). In particular, following current market trends, digital television and third generation (3G) mobile systems driven by commonly adopted standards can open up significant possibilities for a variety of platform access to services, offering great features of substitution and complementarity. The same option holds for the supporting networks as well (European Commission, 2003a).

Within the above fast developing and fully evolutionary context, the thematic objective of digital video broadcasting (DVB) applications (including both the underlying network infrastructures and corresponding services offered) can influence a great variety of areas (http://www.dvb.org). In particular, DVB stands as a suite of internationally accepted open standards, mainly related to digital television- and data-oriented applications. These standards (in most cases already tested and adopted in the global marketplace) are maintained by the so-called *DVB Project*, an industry-driven consortium with more than 300 distinct members, and they are officially published by a joint technical committee (JTC) of the European Telecommunications Standards Institute (ETSI), the European Committee

for Electrotechnical Standardization (CENELEC), and the European Broadcasting Union (EBU).

The existing DVB standards cover all aspects of digital television, that is, from transmission through interfacing, conditional access, and interactivity for digital video, audio, and data. In particular, DVB not only includes the transmission and distribution of television program material in digital format over various media, but also a choice of associated features (considered for exploiting capabilities of all underlying technologies). However, market benefits can be best achieved if a "harmonized" approach, based on a long-term perspective, is adopted since the beginning of all corresponding efforts, intending to facilitate a progressive development towards new (and more advanced) services in a smooth and compatible manner (Oxera, 2003). An essential precondition for this progress is the adoption, *in the market sector*, of common standards which, while providing necessary clarity for both producers and consumers in the short term for early introduction of digital television facilities, also supply the potential for subsequent smooth upgrading to new and higher grades of service.

Thus, in the framework of competitive and liberalized environments DVB can support major efforts for the penetration (and the effective adoption) of enhanced multimedia-based services (Fenger & Elwood-Smith, 2000) independently of the type and/or format of the content offered while *simultaneously* promoting broadband opportunities. Furthermore, being fully conformant to the requirements imposed by convergence's aspect, DVB can advance optimized solutions for different technical communications platforms.

The European market has been widely developed in the area of (interactive) digital television (Chochliouros et al., 2006; European Commission, 2003b) and the EU is now leading further deployment through DVB procedures. The focus provided by a common set of technical standards and specifications has given a market advantage and spurred the appearance of innovation perspectives.

BACKGROUND: ACTIVITIES PERFORMED IN THE CONTEXT OF THE DVB PROJECT

The *DVB Project* (officially formed since September 1993) is a successful market-led consortium of private and public sector organizations in the wider television-related industry, comprising over 250 broadcasters, manufacturers, network operators, software developers, and regulatory bodies (from more than 35 countries worldwide) committed to designing global technical standards for the delivery of digital television and (recently) data services. The basic original target was to provide a set of open and common "technical mechanisms" by which digital television broadcasts could be efficiently delivered to consumers. The DVB consortium came together to create the necessary "unity" in the march towards global standardization, interoperability, and future proofing. Among its core objectives is the proper agreement on specifications for digital media delivery systems, including broadcasting. The effort performed in the broad partnership of companies and organizations involved, contributes to on-going work in various sectors, refining and improving the existing standards and developing new ones that all address the real needs of a rapidly changing broadcasting landscape (Watson-Brown, 2005).

The development of market-driven global interoperable standards is critical to the creation of a competitive environment for convergent services and for any related information applications. To this aim, industry's active involvement in DVB activities has brought a key feature: the belief that specifications are only worth developing if and when they can be translated to products which have a direct commercial value. Thus, all corresponding specifications are effectively "market driven." This conscious effort has contributed greatly to the broad success of DVB standards.

More specifically, each corresponding technical standard is positioned and/or estimated—at first—on actual market needs, where a clear set of user requirements is taken into account to "delimit" several fundamental parameters such as user functions, quality conditions, timescales, and price range (Digital Video Broadcasting, 2001). Once consensus on these user requirements is reached, then a technical specification is developed via the exploration of available technologies, to fulfil the imposed prerequisites. The next step is to address (and to "substantiate") the corresponding intellectual property rights (IPRs) and then to endorse the specification to an official standard for international adoption and utilization. (In the administrative structure of the DVB Project there are specific internal functional units known as "modules," each one covering a detailed element of the work undertaken and exactly corresponding to the previously described procedures).