

European Digital Television: Future Regulatory Challenges

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ABSTRACT

Digital Television (DTV) has developed in Europe more or less independently from the European Union, where 'light touch' regulation has been the major policy line. The development has been partly in the hands of dominant satellite broadcasters and partly in the hands of member state governments, national regulators and broadcasters.

Digital Video Broadcasting Project, a European-based consortium of television industry, successfully developed the common digital broadcasting modulation standards but there is still a lack of common middleware standards used for interactive services and pay-TV access. This situation is segmenting the European digital television markets dominated by satellite broadcasters with their proprietary standards, preventing the viewers from accessing a full range of digital channels with one device, and causing unnecessary costs and delays in the production of interactive DTV services.

This paper deals with future problems of digital television standards from the point of view of public interests, public service and open access questions. It also discusses other future regulatory challenges connected to DTV. These include questions like the Listed Events policy, interactive advertising and most of all the remit of public service broadcasting and public regulation in general.

Introduction

Contradictions and conflicting goals have marked the European Union audio-visual policy. Following Richard Collins (1994) it has become common to see these conflicts as an ongoing battle between two different approaches, *deregulatory* and *dirigiste* vision, the first referring to market liberalization, the latter to directives and cultural policy operations.

Of course one can see this dichotomy as a simplistic sketch. As Graham Murdock has convincingly argued, deregulation may also be a misleading term in this context. According to him '*marketization*' could be a proper term, because there are several policy shifts involved: privatization, liberalization, the reorientation of regulation, corporatization and commodification

(Murdock 2000, 39-43). David Levy supports this view by emphasising that the move from monopolies to competition on the European television markets prompted regulatory reform and re-regulation rather than wholesale deregulation (Levy 1999, 22). I would myself emphasise that there has been a clear shift from content regulation to competition policy and that neo-liberalism has been the main trend for the last decade. The commercial interests have clearly been in the foreground in the European media and telecom policy, even though the Amsterdam Protocol (1997) succeeded to hinder a total decline of public service broadcasting. At any rate it seems clear that "coherence has never been the strongest aspect of European audio-visual policy", as David Levy (1999, 40) puts it (see also Harrison and Woods 2000; 2001).

In my paper I describe – with some historical background – how European Union policy in the field of digital television has been crippled by incoherent and frail neo-liberal regulation. There has existed a strange combination of technological determinism and market optimism combined with inconsistent 'light touch' regulation. Public interest principles and policy goals have been used in the rhetoric of many EU policy documents and speeches but these good intentions have not been effectively implemented into directives. This has affected negatively the emergence of digital television in Europe, both in terms of public interest and in terms of market prospects. I will also discuss some other European regulatory challenges associated with digital television in the future.

Marketization of the audio-visual policy - historical background

The European Union did not invent the neo-liberal deregulation of the audio-visual media. This trend of the early 1980's developed through national decisions, which ended the era of public service monopoly in television and radio broadcasting in most European countries and opened the market to satellite broadcasting. The European Union has at any rate heavily supported and further developed this trend.

Ever since the Treaty of Rome (1957), the idea of free trade and efficient market competition without national subsidies on the European common market has been constitutive for European co-operation. The goal to build a single, competitive and commercial European audio-visual market has long inspired policymakers in Brussels. A series of subsidy programmes, proposals and directives have been aimed to overcome Europe's segmentation into national markets and to create a genuinely European audio-visual industry. Within this frame national public service broadcasting has often been treated as an economically inefficient exception to the rule and also as a potential disadvantage for the development of European identity. Already in 1982 the so-called Hahn Report for the European Parliament declared that mass media controlled at national level is a barrier to European political integration. The same tone was echoed in the 1984 Commission Green Paper on Television without Frontiers – the early version of a later TVWF directive (1989/1997) – which supported the idea of common television markets based on private content production and competition. The directive made it illegal for a Member State to prevent reception of a TV-channel licensed elsewhere in the EU and thus inhibited protective regulation on national level. (Levy 1999, 41-43; Levy 1997, 662).

There has also existed an European policy which has supported both positive media regulation, mainly in the form of support programmes for the European audio-visual content production industry, and negative regulation, in the form of constraints and obligations to the national broadcasters. This 'dirigism' was also reflected in the TVWF Directive (1989/1997) even if only quite minimally; advertising time and the placement of the slots was regulated, protection of children and prohibition of racial or religious hatred were mentioned and the famous European content quotas were included. The quotas oblige broadcasters to reserve a majority proportion of their transmission time (excluding news, sports, games, advertising and teletext) for programmes of European origin. The effectiveness of this potentially most important requirement was halted by provisions specifying that member states only need apply quotas "where practicable and by

appropriate means". The national channels must report the percentage of European content to the Commission annually, but this practice has only had symbolic impact on the satellite and cable broadcasters. The guidelines for national implementation have also been quite irregular. David Levy estimates that instead of the overall competitiveness of the European TV industry the TVWF directive has supported the UK based non-domestic satellite services and the free circulation of American programmes. (Levy 1999, 41-44, 161-164.)

When Commission President Jacques Delor spoke to the European Parliament in 1989, he emphasized that European television policy is required both in the name of competitiveness and in the name of cultural defence: "the Community refuses to leave the monopoly of audiovisual techniques to the Japanese and that of programmes to the Americans" (ibid., 1999, 42). If the goal of European audio-visual policy really was to build a larger and unified European television market which could better compete with American import of programmes then the policy has failed. At the time of neo-liberal television policy the European Union audio-visual trade deficit with the USA has only grown larger (Tongue 1999, 106-9; Levy 1999, 45; Hancock 1998, 137-8). The European Commission has estimated that in 1999 the share of US import on the audiovisual markets of the member states was between 60 and 90 percent with a total value of 7000 million Euros, while the share of European import on the US markets was only 1-2 percent (COM(1999)657, 7). As Richard Collins has noted, new competition and market growth has not taken place on the pan-European level but on national markets only (Collins 1998, 31). On the pan-European television markets the American English is still the only *lingua franca*.

There are several reasons for US dominance on the global television content markets that I can only refer here. Originally American dominance can be traced back to European nationalism and the World Wars that ruined both the general economy and that of the film industry in Europe. At the same time Hollywood studios developed the most efficient commercial production delivery chain using both vertical and horizontal integration (Jowett & Linton 1981, 36-37). American film drama tradition based on stories of individual heroism and heterosexual romance using internationally understandable stereotypes has appealed to audiences all around the world (Higson 1989). This drama tradition shifted to US television drama production, which has capitalized the world largest domestic television market, developed efficient international delivery chains using the world's largest second language and has been able to sell programmes to foreign exhibitors at prices below that of domestic exhibition (Corcoran 1999, 77-79). Because of these deep rooted structural reasons the inability of Europe to defend its domestic audio-visual content industry of American import is not surprising and this cannot be changed merely by commercializing the European television production along the lines of American model.

Digital television and missing single markets standardization

After at least two decade's active discussion on Information Society (IS) and knowledge-based technology as a factor of economic growth the 1990's saw the rise of official initiatives and strategies where IS was defined as a national goal to strive for, because of its importance to global competition, employment and general well-being. In this administrative transformation important critical, ethical and political concerns of previous academic discussions on IS were more or less vaporised. In 1993 an extensive National Information Infrastructure Program (NII 1993) was launched in the USA, a similar strategy was launched in Japan. The European Commission white paper *Growth, Competitiveness and Employment* (COM (93) 700) followed soon after and gave rise to similar national initiatives in the member states too. (For a critical analysis on the IS rhetoric of the EU see Goodwin & Spittle 2002 and Kaitatzi-Whitlock 2000.)

The general IS strategies of the EU soon became interwoven with the ideas of media convergence – the technological and economic integration of telecommunications with information systems and

broadcasting networks. The Bangemann Report (1994) especially gave further support for the marketization of both telecom and audiovisual sector in the context of IS and convergence.

The Bangemann Report was prepared by a group of key figures from industry under the aegis of Commission Vice-President Martin Bangemann. It emphasized the urgency of Community actions to ensure Europe's international competitiveness. Convergence was seen opening new market opportunities in a way which makes it necessary to accelerate the ongoing process of liberalization of the Telecom sector. This argumentation further developed in the report "Public Policy Issues Arising from Telecommunications and Audiovisual Convergence", which the Commission ordered from a private consultant company KPMG in 1996. It emphasized the liberalisation of both telecom and audio-visual sector. This idea was then filtered into the EU Green Paper on convergence (COM (97)623) which further supported the idea of a more 'technology-neutral' competition regulation instead of content regulation. The viewpoint of the Commission has ever since been that to avoid market distortions in the developing new media markets so vital for European competitiveness, the EU should minimize its regulatory interventions. (Levy 1999, 129-130; Murdock 2000, 41;).

The first policy documents considering digital television (DTV) from 1993 and 1994 also stressed the single market argument. The importance of common pan-European standards as the essential precondition for harmonious pan-European market evolution was strongly emphasized (Levy 1997, 662; Council Resolution 1994), like it was accentuated in the Bangeman report too (1994, 12-13).

In spite of its common standards rhetoric, the first piece of regulation tailored to digital broadcasting, the Advanced Television Standards Directive (ATSD 1995), was drafted in a way that it did very little to facilitate the emergence of a single European digital TV market supported by common standards. The directive left the DTV operators free to use proprietary Application Programming Interface (API) and Conditional Access (CA) systems, if they only promised to licence their technology to other operators "on fair, reasonable and non-discriminatory terms" (ATSD 1995, article 3c). Soon it became clear that the lack of common standard in these "middleware solutions", essential for pay-TV operations and interactive applications, was in practise an efficient obstacle for common standard digital television markets. (Nolan 1997; Levy 1997; Llorens-Maluquer 1998; Galperin 2002)

The immediate reason for this was that the standardization issues of digital television had been left to the hands of the Digital Video Broadcasting Project, an industry-led European consortium of over 300 broadcasters, manufacturers and operators (see www.dvb.org). DVB group succeeded well in creating common European transmission standard for satellite, cable and terrestrial broadcasting by the end of 1993. The standardization of the API and CA systems proved to be much more difficult, because in these areas there existed conflicting interests among broadcasters. The interest of analogue pay TV satellite broadcasters was to extend their control of their proprietary CA systems (and customers) to the digital market, and not to open the market to competitors with open standards solutions. (Galperin 2002; Levy 1997, 667-671)

In spite of the fact that the prospects for industry consensus faded the next few years, the Commission refused to make any interventions. The absence on middleware software standard meant that while broadcasters could transmit their digital signals across Europe, audience access would in fact be limited to those viewers equipped with the right kind on set-top box receiver (STB). Since then European DTV markets have been fragmenting into rival blocks operating a series of incompatible STBs even within the same national or linguistic market. (Levy 1997, 662-3)

European digital broadcasting started in 1996 with Italian DStv, Canal Satellite Numérique (CSN) in France and DF1 in Germany (Murdock 2000, 47; Levy 1999, 8-10). The Commission tried later to negotiate Bertelsmann's Premiere to use Kirch D-box technology but did not succeed. In France similar hardware war was seen between CSN and Télévision Par Satellite (TPS). (ibid.; Levy 1999, 65-67, 116) The Spanish government tried to impose Canal Satellite Digital (Canal+) to use similar

CA technology than partly state owned Vía Digital by a special law, but this action was prohibited by the Commission who saw it as a violation of Treaty rules. (Llorens-Maluquer 1998) (These Spanish digital platforms announced to merge in May 2002 after the collapse of DTT operator Quiero; see Fernández 2002.)

There were several reasons for this non-regulative DTV policy. As Levy well documented, it resulted from a conscious policy shift of the Commission aiming to establish more market-responsive machinery for standardization, led by voluntary activity of private corporations (Levy 1997, 665-667). This shift came after the EU driven efforts between 1986 and 1993 to build a common standard for analogue High Density Television (HDTV) through the so-called MAC Directives and subsidies for wide screen production had failed totally. The satellite broadcasters just didn't want to adopt the standard at the dawn of digital technology and EU was unable to maintain its policy when faced with commercial opposition. The policy makers in Member States, in their "early bird" enthusiasm, were also reluctant to slow down the pace of the digitalization with regulation and standard issues and too much entangled to protect the interests of broadcasting corporations operating from their national grounds. (McPherson 2002, 83-84; Levy 1999, 63-79)

Due to missing standard regulation the evolution of digital television in Europe has been in the hands of the big satellite operators trying to monopolize national markets. I call this weak European regulation of DTV a lost opportunity. There was an opportunity to regulate the European DTV market in a way that would have supported the creation of a pan-European television market. This did not succeed because the European policy makers were too much entangled in the principles of minimal regulation, marketization and hastening the digital development. What is lost is not only common pan-European markets, but this situation has made the production of interactive applications for DTV platform expensive, risky and modest because they must be tailored separately to different proprietary STB platforms. Also this situation is very difficult for terrestrial broadcasters, especially PSBs, who don't have the financial sources to give away subsidised proprietary set-top boxes. And in the end, also pay-TV operators have paid their lessons, as recent collapses of ITV Digital and Kirch prove.

MHP – an open opportunity for the second generation?

After difficulties the DVB group finally succeeded in creating an open API standard for digital television. This Multimedia Home Platform (MHP) standard using Java language was officially recognised by the European Telecommunications Standards Institute (www.etsi.org/) on 12 July 2000. As an open solution MHP can in principle be used to deliver EPG and new interactive TV services and facilitate Internet browsing on different user end platforms. MHP is now supported by German and Nordic TV operators.

The problem is that MHP does not interest the digital satellite broadcasters who already have gained a substantial market share with their proprietary middleware technology. This makes the hardware manufacturers also less keen to MHP. MHP also requires more efficiency on the processor and more Flash/RAM memory from the STB hardware than the first generation platforms, like MediaHighway (Canal+) and OpenTV (BSkyB) (Flynn 2001). This is probably one of the reasons the STB manufacturers have not been hurrying to start mass production of MHP standard boxes: they will be more expensive to produce than the proprietary ones at the early phase.

Finland announced last year to be the first European country to decide to start digital broadcasting with MHP standard. This has not succeeded in practice, because by the time digital broadcasting started in Finland (27 August 2001), no MHP boxes were on the market. This has seriously diminished the credibility of DTV in the eyes of the viewers, who are not willing to invest in a technology that may be outdated when the MHP boxes finally enter the market. At the moment

there is one expensive integrated model (iDTV) by Sony on the market and most of the about 30000 sold first generation STBs are incapable to offer digital teletext or interactive MHP services.

The European Commission has been supporting the MHP standard for the last two years, but only symbolically. The communication by the Commission on the principles for the community's audiovisual policy in the digital age (COM (1999)657, 15) promised that the Commission is closely monitoring API standards development, but did not propose any specific action "at this early stage, when market and technological developments are highly unpredictable" (ibid., 15) Since then there have been more and more demands for concrete action on this matter. For example a recent report to the Commission suggested that actions to further support MHP may be needed (OVUM 2001, 6, 26-28).

In mid December 2001 the European Parliament voted to accept a compromise deal on the EU Telecom Package to modernise and simplify the current regulatory environment for electronic communications in Europe. The compromise gives the European Commission powers to oversee national regulatory regimes and in principle includes possibilities to demand common standards when absolutely necessary. The German MEPs especially wanted to have a clear mandate for MHP in the future STBs to be included to the package, but the representatives of the UK were against this, nor it was supported by the Commission. What was at any rate agreed was that the Commission has to communicate to Parliament, as soon as possible, the concrete steps the Commission will take to ensure the rapid adoption of interoperable and open system for digital TV services in the European Union. (Paasilinna 2001a and 2001b; COM(2000)393, 12, 25)

Paradoxically, on the new emerging market private enterprises may also gain economic advantages by leaning on an open standard not controlled by them alone. But private institutions do not use this strategy if they have the chance to gain advantage by dominating the markets with proprietary technology. Pyungho Kim, studying early interactive television systems in the USA, has emphasized that a closed, proprietary system of interactive television was a failure in the USA not only economically but also culturally because it inhibited active involvement and participation in the user part and was fundamentally restricted to a consumeristic information retrieval system (Kim 1999). We may ask if this kind of failure can still be avoided on the European continent with open interactive standard of DTV only. Maybe not, but without it, the chances are even worse.

Common API standards can support efficient and relatively cheap production and use of interactive services and open Internet browsing in television. Without it the interactive potential of DTV is probably diminished for shopping channels and pay television niche programming – just as some critical comments have predicted. Without interactive services "digitalization appears to be 'crippled' in Europe", as Kleinsteuber (1998) notes. Østergaard (1998) emphasizes the same by saying: "Today's proprietary consumer equipment in Europe limits cable and satellite distributed television to on-way transmission of TV channels. Multimedia is developing instead on the more open, US-dominated Internet." (ibid., 105). With loosely regulated digitalization we seem to be getting only more, not better or enhanced television.

This year will show if there will be enough support to MHP from the regulators or from the broadcasters – or if it is too late. It may well be that the "legacy" of already installed incompatible set-top-boxes (appr. 15 million units) will make full interoperability a long and difficult process for the European DTV operators and consumers.

Some other regulatory challenges associated with the future of DTV

In addition to standardation and interoperationality issues, there are many important future regulatory questions concerning telecommunications and media in Europe, all of which are of importance also for the development of the DTV. I will next discuss only the ones that I see most

closely linked to digital television from the viewpoint of public interest and public service, and leave out of sight important issues like general broadband strategy and eEurope project, national or international subsidy programs for European content production and copyright legislation which is always at difficulties balancing with the interests of the producers, authors and creators and the general public, the users.

Advertising regulation

Digital television gives new possibilities for advertising. Electronic programme guide (EPG) can include commercial information. With split screen advertising (allowed in the United Kingdom and Germany at the moment) the ads can be shown in a separate picture-in-picture space without breaking the programme stream. Ads can be small clickable buttons where you can enter internet-type microsite to get more information or perhaps an opportunity to test a product. Ads can be connected to T-commerce application where you can buy the products. Consumer Relation Management (CRM) systems implemented in the set-top box may gather information of the channel and service preferences to allow targeted advertising. (Sims 2001)

All these innovations make it difficult to apply the TVWF (1989/1997) regulation on advertising, which is based on time slots and says that commercials have to be readily recognisable as such and kept quite separate from other parts of the service by optical and/or acoustic means (ibid., Sims 2001).

The European Commission has just received a report by independent experts on the development of new advertising techniques and it also revealed an obvious need to clarify some of the advertising provisions in the TVWF directive. (Commission MEMO/02/130) Also the consumer privacy issues must be addressed in detail.

Listed events policy

The so-called 'Listed Events' policy was introduced in the 1997 revision of the Television without Frontiers Directive (TVWF 1989/1997). The background to this was that the increasing competition on the European TV market after liberalization had led to drastic price increases in the broadcasting rights of the most attractive sport events. There was real public concern that nationally important events like the Olympics could in future be televised by pay channels only (Papathanassopoulos 1998; Solberg 2001). Listed events policy gave the member states permission to ban the pay channels from acquiring exclusive broadcasting rights to events regarded by that member state as being of major importance for society and officially listed well before the event (TVWF 1989/1997, chapter II, article 3a). The purpose was to guarantee that specific public events remain available free-to-air too.

Overheated market of sporting event broadcasting rights was one of the reasons to the collapse of both ITV Digital and Kirch pay-TV. The listed event policy will not solve the problem of increasing broadcasting costs, but will be necessary also in the future, when increasing digital channel quantity is increasing the competition on broadcasting rights. Listed events policy may slow the speed of price escalation, as well as the EBU co-operation in purchasing the rights, and they both thus benefit the general public. Details of listed event regulation are often difficult because of different market structures, and they need to be considered on a national level – and applied also to other events than sports if necessary.

Analogue broadcasting switch-off strategies

In many media sectors digitalization and convergence make room for *time-dependent regulation*, especially when there are major changes happening. Switch-off time for terrestrial analogue broadcasting is definitively this kind of issue, even if not yet at sight in many Member States.

DTV enthusiasm on both national and EU level can be partly traced back to the overheated market expectations of third generation mobile industry. There has been an assumption that after the analogue shut-off date the freed spectrum could be auctioned up to the 3G-operators, this could give financial resources for the governments and room for more competition and advanced services on UMTS markets. (Grünwald 2001) These expectations are not powerful right now, after the European telecoms voluntarily paid huge overprizes of 3G network licences on central European markets and came into serious troubles in financing the development further. UMTS bubble demonstrated once again that Hype is neither a good business model nor a good backbone for public regulation.

European switch-off strategy is needed to avoid overheated expectations but also to well in advance set a date for analogue switch-off to give the markets and consumers enough time to react (Grünwald 2001). Advantages and disadvantages of spectrum auctions should be considered well in advance. It could be also possible to connect obligatory implementation of MHP standard in broadcasting and STBs to the analogue switch-off date to give markets a sufficient amount of security.

Spectrum allocation is a national issue but should be co-ordinated at European level because, like McPherson (2002, 87) has noted, digital signals are "essentially constrained within the parameters of the nation state unless a deliberate decision is taken to rebroadcast them via booster stations". Receiving of analogue channels across the national borders has been a "common man's pan-Europeanism", and it is danger in digital era. At least the European free-to-air broadcasters should well before the analogue switch-off negotiate contracts to make foreign signal reception possible, as an Internet video stream if nothing else.

Community radio and television may also encounter problems with digitalization. Access of citizens and communities to broadcasting content production is a regulatory question that has got too little attention in the European licensing policy. This question should be addressed both on national and European level along with spectrum allocation, and maybe implemented into the remit of public service corporations.

The future remit of PSB

In the Commission on Public Service (2001) EU is requiring member states to distinguish clearly between defined public broadcasting activities and activities in the competitive domain. The budgets of license-fee financed corporations should also be more transparent so that it is possible to assess whether public money is used to subsidise new services. While member states are now in principle free to define the extent of the public service and the way it is financed and organised, they need to establish a precise definition of the public service remit, to formally entrust it to one or more operators through an official act and to have in place an appropriate authority to monitor its fulfilment. (See also COM (1999)657.)

There is a great danger that public service remit definitions imply more narrow definitions than before. In Denmark, a new draft media law for radio and television outlines plans to privatize the public network TV2 and in Portugal the government is considering to transform the current public network RTP into a single channel without advertising resource (IFJ 2002). Definition can also become very different in Member States. Simple genre based definitions stand against the

prevailing European tradition. There has also been discussions, whether PSB functions could be split up and provided by different broadcasters, not maybe only state funded. (Harrison and Woods 2001)

What is needed is European harmonization on the PSB definitions at least to a certain extend. Definitions should ensure wide enough general remit, define the PSB role on online, DTV and pay-TV services and guarantee funding principles that can make PSBs independent from straight political control and commercial interests. Broad public access to free-to-air services should be guaranteed both before and after digitalization with e.g. well defined *must carry* rules. Harmonized support for public service will be ever more important when new Member States are entering the EU, otherwise it will most difficult to develop European public service policy further or even to use the term *public service broadcasting* accurately.

The propagators of "digital future" (e.g. Biggam 2000) often indicate that the future of television lies in limitlessly available on-demand channels serving niche audiences, actively selecting critical consumers with individual needs. This, it is argued, will inevitably force the PSBs to abandon mixed scheduling, stop the strive for maximum audience share and make them content with providing public service niche programs that are non-profitable for the commercial broadcasters – and accept the declining public funding.

We can also propose the opposite and say that the channel proliferation combined with cultural and technological fragmentation and increasing pay television services will make the role of PSBs only more important. PSBs can still stand for universal and equal service, social cohesion, democratic public debate, national and European identity and cultural values. Like Lievrouw (2001, 22) puts it: "Reliance on highly fragmented or targeted information sources (...) may reinforce people's identification with narrow interests, their sense of difference from other groups and indifference toward larger social concerns." (Cf. Harrison & Woods 2000, 487-490.) In absence of European public service satellite channels, national PSBs must still have integrative social functions.

Most important: the remit for regulation

What we – and the EU Commission especially – should learn is that regulation is not harmful for business. On the contrary, at times regulation is desperately needed by commercial market actors too, especially by the ones who are not monopolizing the market. Stuart Prebble, former chief executive of ITV Networks, made this point very clear in his remarkable article in Sunday Telegraph, written only days after the collapse of ITV Digital. Without avoiding self-criticism he also blames the missing or too slow regulatory actions in the UK which could not prevent the BSkyS to eliminate competition (Prebble 2002). Like Cammaerts (2000, 48) notes, public regulation and state intervention can also function as enabling factor in the economic process.

In the prevailing EU media policy regulation emphasis is on cross-sectoral competition and anti-trust regulation to avoid players of significant market power – including public service corporations – to dominate the market and disrupt competition. Self-regulation, co-regulation and proportionality are favoured. Regulation should be minimal and take place only when market failure is evident. (Reding 2001; 2002) The Commission is demonstrating its views with a following vision of declining role of content regulation along the technical development:



(Source: Commission on Audiovisual Content Regulation; FTA referring to free-to-air television.)

What Commission is missing in the technocratic optimism reflected in this picture is that the quantity of channels and interactivity available in the delivery network do not guarantee the free consumer choice or make self-regulation sufficient. As a platform for communication and services broadband is capable to multiple functions, from mass media delivery to personal communication, but I can not see the broadband as a magic tool to skip regulation – it only requires for different kind of regulation that e.g. free-to-air broadcasting.

There will always be technical, financial and contractual limits and bottlenecks in audiovisual services both in terms of consumer choice and in terms of barriers to entry. A need for spectrum allocation will prevail in the digital broadcasting and the broadband networks have also material limitations in terms of bandwidth, router and media server resources. The major limitation on both television and broadband content markets will anyhow be on the content production economics, including copyright issues and ownership of broadcasting or netcasting rights. "There is only one Premier League, only one Wimbledon and only one World Cup", like Nolan (1997) puts it. The concentration of ownership in the converging digital world may also hinder the diversity of supply to increase despite the increasing number of channels. The "Audiovisual Xanadu" offering free choice of all the television content in the world will never materialise on this planet.

Competition regulation works best on the market with no *de facto* monopolies and with significant amount of players with equal opportunities. On the emerging new markets with old dominant players – like on the DTV markets – the situation is totally different. Actually full and fair competition rarely exists. The "natural", de-regulated development on the market goes often towards the dominance of the most strong and active players. There is both theoretical and empirical evidence that more competition does not automatically lead to more choice, content diversity, cheaper consumer prices and well functioning markets. (Blevins 2002; Collins 1998, 393-395; Tongue 1999, 131-2; Picard 1998, 213.)

Fair competition also assumes free choice by the consumers. One problem in this is that television services are connected with technology, that sometimes is "behind the wall", to use a metaphor of by John Taylor. The technologies in front of the digital wall are the ones that people see and use (user end systems). The technologies behind the wall are the structures of technology, systems of services, standards and other design that affect how the technologies can be used. (Mansell 2000, 43) Consumer choice cannot easily regulate this area. In the future the EU regulators should more actively intervene in standardization issues also both in the audiovisual and telecom sectors, even if it will be difficult to know, when and where to intervene.

Cross-sectoral competition regulation is an important tool for market regulation, but it is not enough. European failures in the digital television middleware standards proves that sector specific regulation is still urgently needed. Difficulties with standardization are too complicated and technical to be resolved on cross-sectoral level only. (Levy 1997, 676)

Cammaerts (2000) describes the prevailing need for sector-specific public regulation in the Information Society by the following chart:

	ACCESS	PROTECTION
SECTOR-SPECIFIC	<ul style="list-style-type: none"> • universal service • interconnection • standardisation 	<ul style="list-style-type: none"> • anti-trust policies • consumer protection
CROSS-SECTORAL	<ul style="list-style-type: none"> • universal access • right to information 	<ul style="list-style-type: none"> • data protection • illicit content regulation

This picture is a good basis for discussion, but it is still missing the division of regulatory responsibilities at the national, European or more international level. This question needs serious consideration at the time when the European constitution is under preparation. The European Round Table of Industrials (ERT 2002) is supporting even stronger Commission "with a clear remit" as an institution most capable of articulating the common European interest above national / regional interests. The opinion of ERT is no wonder considering that the Commission has lately been subordinating public interest policy for industrial policy. But the Member State regulators should not give way to one-sided industrialism of the Commission.

We have no reason to rejoice the fact that the regulatory response to digital TV has been difficult in USA too (see Galperin 2002) but we, as academics and researchers, should help EU commission, MEPs and national authorities to admit the problems of market-led regulation and help them to find better solutions and better regulation.

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APPENDIX: The Acronyms used or relevant for the subject

API - Application Programming Interface; As a set-top box (STB) term API is equivalent to a operating systems in a computer, e.g. Windows or Linux. With API the programmers can write applications consistent with the operating environment, and programs using a common API will have similar interfaces for users. In STB API can be used to control CAS or EPG also, which all together form the "middleware solutions" of interactive services. Only common API ensures interoperability of digital receivers so that one STB can receive programs and services from more than one platform.

ATSC - Advanced Television Systems Committee. Established the American standards for digital television. Standard is using 8-VSB signal modulation, including digital high definition television (HDTV) but using the bandwidth less efficiently than the European COFDM. See www.atsc.org

Broadband - Traditionally a network connection capable for delivering one digital video signal comparable to analogue VHS video quality. In prevailing MPEG-2 compression technology that means a connection with 2 Mbit/s undisturbed bandwidth, even if Internet Service Providers are sometimes inaccurately calling broadband even 256 kbit/s speeds.

CAS - Conditional Access System

COFDM - Coded Orthogonal Frequency Division Multiplexing; digital signal modulation capable to transmit many streams of digital data simultaneously, each occupying only a small portion of the total bandwidth.

DAB - Digital Audio Broadcasting

Digital teletext - Enhanced digital version of the analogue text television service, including high definition pictures, multimedia or animation. Used for information services or advertising. Also known as SuperTeletext.

DTH - Direct To Home satellite television

DTT - Digital Terrestrial Television

DTV - Digital television (standard definition using 6 Mbit/s bandwidth in MPEG-2)

DVB - Digital Video Broadcasting; European standard for digital television, using COFDM modulation technique and adopted by e.g. Australia, New Zealand and India too. Used differently in terrestrial (DVB-T), satellite (DVB-S) or cable (DVB-C) broadcasting. See www.dvb.org

EBU - European Broadcast Union, see www.ebu.ch/

EPG - Electronic Programme Guide. A channel selection and navigation software for digital television; used to find, select and record programs and services. EPG-functions can be connected to other interactive applications too, like additional information services, advertising or teleshopping.

ERT - The European Round Table of Industrials. An independent forum and lobbying group of over 40 European industrial leaders. Created in 1983 and aiming to strengthen Europe's economy and improve its global competitiveness. See www.ert.be

ETSI - European Telecommunications Standards Institute. See www.etsi.org

FTA - Free to air television

HDTV - High Definition TV, using 20 Mbit/s bandwidth in digital MPEG-2 coding.

idTV - integrated DTV where the STB and the monitor are attached

IRD - Integrated Receiver Decoder, see Set Top Box

kbit/s - Kilobytes per second; an amount of thousand bytes (composed of 8 binary bits each) that a digital delivery line can transfer in one second.

MPEG - Moving Pictures Expert Group; MPEG-2 is the prevailing standard for signal compression in digital broadcasting both in ATSC and DVB standards

PPV - pay per view; a PTV system where the viewer payes only of viewing time, and not with e.g. a monthly fee.

PSB - Public service broadcaster

PTV - pay television

PVR - Personal Video Recorder; a separate device for digital hard disk recording and storage of television programmes.

RAM - Random Access Memory. The place in a computer where the operating system, application programs, and data in current use are kept so that they can be quickly reached by the computer's processor.

STB - Set Top Box; receives the digital broadcasting signal and translates it understandable for analogue TV set; basically a computer which includes microprocessor, RAM memory, operating system, Conditional Access System (CAS), memory card reader and sometimes even a modem and a hard drive recorder (PVR). Also know as IRD.

VHS - Video Home System, dominant analogue home video standard

VoD - Video on-demand; system where all the (audiovisual) programs and services are booked and downloaded from the available selection separately; home delivery can take place real time or near real time (near VoD) via broadband delivery or broadcasting stream.