Chapter 1 - Technical devices and rating systems

Introduction

Often, a discussion of rating or labelling systems is divorced from the technical context in which the information contained within them is delivered to the parent or other recipient. Ratings can have broad notice and educational purposes; and how Member States generally fashion and administer them is discussed in Chapter 2. Further, accompanying media education campaigns and media literacy policies are vital components of any rating or labelling policy. This is true whether a rating or labelling system functions with or without a technical device. These considerations are discussed in Chapter 3. In this chapter, the Study explores a much more specific issue: when the decided function of advisory information is to trigger a blocking or filtering action what impact does the design of the triggering device have on the design of the label? The question can also be put in the converse: if the conditions of an ideal (or approaching an ideal) rating or labelling system are known, what technical device or set of devices can make that system operative?

1. Background

Rating and labelling systems find their origins in the world of film, and they had several purposes. Rating and labelling functioned, inter alia, to determine whether a film could be released at all (at least in some Member States) and to inform parents and others, for which groups a film was suitable. In some cases, film theatres are required to refuse admittance to a person because of the unsuitability of a film to his or her age.

The history of film ratings offers a guide to the issues that will be raised by implementing rating and labelling systems in the television sphere. Clearly, the primary purpose of television ratings is to provide information for potential viewers, but the other objectives of cinema ratings apply also to the debate over television ratings. For example, establishing a rating to determine whether a film should be released at all (or be played in theatres generally open to the public) has its correlative

in the question of continued broadcaster responsibility: whether a given rating determines that a programme cannot be shown; or can only be shown after the appropriate watershed; or only on earmarked, encrypted or subscriber channels. The Study will return to this question when examining the relationship between rating and labelling systems and continued areas of broadcaster responsibility.

For television, a technical device may prove to be the desirable equivalent of the box office manager refusing admittance to minors. Theoretically (and it was subject to some manipulation), a rating or label was an instruction to the ticket seller to refuse entrance to persons for whom the film had been classified as inappropriate. Like the ticket seller, technical devices for parental choice act as a gatekeeper, with the capacity to determine, even if approximately, whether someone who wishes to gain access is qualified to do so.

1.1 The search for a technical device: North America and the V-chip

The divined Golden Fleece of empowerment is a technical device that will allow a parent or guardian to control the television receiver so that programmes deemed undesirable will not be accessible to a minor under their care. Obviously, a rating or labelling system alone, while beneficial, does not sufficiently empower modern parents who, for a variety of reasons, may not be in custody of the receiver at the time that a programme decision is being made.

The V-chip, invented by a young Canadian engineer, Tim Collings, appeared to be the magic instrument for such parental empowerment. Originally, the V stood for Viewer, as in Viewer choice; later, it metamorphosed into V for Violence, to mark the particular kind of undesirability that was the motivating reason for adoption and promotion of the technology. As the debate in Canada and the United States matured, the V-chip was broadened to include undesirable programmes because of explicit sexual content as well as violent content.

At any rate, the V-chip provided the internal mechanism that would allow a parent to act, in advance, on information that was embedded in the programme. The technology promised to allow the parent to be an effective gatekeeper. The parent, using an

instrument like a remote control, could direct the television receiver to block out programmes that had particular triggering signals.

After a period of study and research in Canada in which the broadcast industry, other groups and the Canadian Radio and Telecommunications Commission worked closely together, the V-chip and an accompanying labelling system was finally adopted there in 1997.[1] In the United States, with the 1996 Telecommunications Act, the Congress ordered that the V-chip or similar technology be installed in all receivers of a minimum screen size and urged the broadcasting industry to develop an accompanying rating system on pain of further federal intervention. In 1998, a self-regulatory system for labelling was found by the Federal Communications Commission to be such an acceptable accompaniment.[2]

1.2 The European context

It is in this context that this Study appears. For a long time, Member States have had rating and labelling systems, more comprehensively for cinema but for broadcasting as well, and these are fully explored in Chapter 2. These systems have varied in terms of the degree of involvement of the State, the mode of communicating the result, the consequences of ratings, and the areas covered in terms of subject matter or age criteria. What has been common, until recently, is that the rating systems operated without a communication connection that triggered blocking or filtering activity at the home.

While the Study reviews this rating history, the V-chip debate in North America opened the question whether, in Europe ratings and labelling systems were or could be linked to technical devices that would permit parents to be more effective gatekeepers. As a result it was proposed under the revised Television without Frontiers directive to analyse the opportunities and threats of technical devices. This proposal mandates the current study.[3]

---

[1] Report to the Canadian Radio-television and Telecommunications Commission from the Action Group on Violence on Television, April 30, 1997.
[2] Public Law 104-104, Telecommunications Act of 1996.
[3] 97/36/EC, *Television Without Frontiers Directive*, 30 June 1997.

1.3 The vital place of technology in choosing labelling alternatives

Almost immediately, it became evident that technology is far more determinative than might have been anticipated. One facile way of approaching the problem would be to ask whether the V-chip system itself should be adopted in Europe; the combination of the proprietary patented chip and a version of the labelling and rating system developed in Canada and the United States. In these countries, the painful processes associated with this intervention have already been undertaken. Determining what labels should cover (e.g. should they deal with age appropriateness or be more informative about content?), what elements could be called judgmental or informative, who should develop the ratings - all this had been fought over and resolved albeit on another continent, at least for the moment.

As it emerged in beginning this Study, the issue could not, for technological reasons, be framed in terms of European adoption of the North American V-chip model or not. The North American solution was an accident of its own peculiarities of programme delivery design. The particular pathway for transmitting labelling and rating information to the chip integrated into the receiver, namely line 21, field 2 of the Vertical Blanking Interval (VBI), was not practically available in Europe.

In itself, this obstacle to the adoption of the V-chip technology was important. But more vitally, it underscored a point that is often underestimated in the discussion over parental signalling. Available technological alternatives must be fully understood so as to appreciate the limits on which a parental choice signalling system can be adopted.

In the exploration of these technological limitations, some minimum characteristics can be defined: For a parental choice signalling system to function, the technical capacity must exist a) to download the information to the receiving equipment and b) for the receiving equipment to enact parental choice decisions based on that information. A necessary design characteristic is that information has to be downloaded with sufficient frequency so that information is co-ordinated with every change of channel or programme. A second necessary design characteristic-at least for an optimally desirable system-is that the system should be tamper proof. For there to be parental choice, by definition, the parental choices cannot be subject to easy

override by the child. To be useful in a European context, a parental choice signalling system must have some applicability in all Member States and must be tamper proof. The system must be of small cost to the viewer so that it can serve low-income families and comprehensible to the vast majority of parents and guardians

A second order question is how the optimal technical system would provide *parental choice*. Would the most desirable European system provide parental choice by *excluding undesirable content* or by *facilitating parental selection* of desirable content, thereby controlling the realm of programming available to minors?

2. Factors in the European environment affecting choice of technical device

At the outset, vital components in the analysis of the technological environment should be set forth.

2.1 The Transition from Analogue to Digital

Most important, any government policy relating to broadcasting must be sensitive to the underlying transition from analogue to digital broadcasting. We conclude that the architecture of a rating and labelling system will change as the shift to digital intensifies. This transition, fortunately, should permit the adoption of policies and technical systems in analogue that will *facilitate* the provision of a parental choice architecture in digital. Available analogue technologies and interfaces permit a useful, if not entirely unproblematic, system technologically as well as in terms of providing a user-interface platform compatible with the burgeoning digital context. Nonetheless,

- Enable households to use a *generally* effective device within the particular transmission and technical environment of their geographic region;
- Orient parents and viewers to the *kinds* of rating and information that should be made available to viewers, acclimating them to selecting among plural (i.e. non-State, non-monopoly) rating and information sources;
- Permit more detailed programming related information as an *alternative* policy to intrusive devices in a technically problematic analogue setting.

2.2 Direct and indirect transmission

There are other over-arching characteristics of technical devices that must be understood as well. For example, there is the difference between direct and indirect transmission of programme-related information. "Direct" transmission implies a mechanism that allows the parental choice information to track the programme itself, to be imbedded in it, to arrive simultaneously with it. An indirect mode of transmitting parental choice information can be effective, but it poses different challenges and uses different signals and devices. Some technical devices have, incorporated within them; specific blocking or filtering devices automatically triggered by the parental choice information. Some technical devices are adaptable in ways that make circumvention difficult; others are not. In many instances, the mode for circumvention is the use of the VCR where the technical device transmits data in such a way or at such a speed that it cannot be recognised.[4] In other cases, minor rearranging of the aerial to separate the two information streams can foil technical devices.

2.3 Need for a "Pipe" or "Pathway"

One of the peculiarities of the European setting is that it is difficult to find a universally available and adequate location for the download of information. In North America, the available space is line 21, field 2 of the VBI, space that was reserved for closed captioning. The V-chip system of parental choice depends on the existence of this pathway for information. It permits sufficient data to accompany a programme and provide the necessary trigger for blocking purposes.

[4] See, *infra,* discussion in Section 3.1, pp. 32-33.

It is critical to begin with the understanding that the North American solution is not viable in Europe. Again, this is, as it were, a real estate question. The space consistently and universally available for the transmission of parental choice information is not available in a reliable way by any network within any Member State.[5] Furthermore, owing to the particular arrangements for transmission protocols in the Member States, there is no convenient alternative.[6] A universal answer with a common decoder facing a common mode of transferring information just is not a solution in the present analogue environment. Certain technological trends and the adoption of particular signalling technologies by broadcasters and receiver manufacturers are providing promise for the future of analogue. Yet, as explained below, the chain of technologies needed to effectively, robustly provide technical capacity for parental choice systems in analogue are not yet proven. Particularly, the technical differences in delivery modes (e.g. satellite, cable, and terrestrial) present serious difficulties in ensuring that adequate protection against circumvention can be presumed. Even assuming that the most viable chain of technologies was *sufficiently effective* to justify regulatory action, the necessary complements of signalling technologies have not been acquired by broadcasters to a significant enough degree to warrant the institution of requirements concerning analogue signalling systems standards at European level.

The anticipated digital environment, through the work of groups such as DVB and DAVIC (to be discussed below), is being primed to maximise interoperability, standardisation and protocol establishment. These standardisation efforts show noteworthy foresight and should be appreciated for the extent that they facilitate the creation of a technical platform for a best-case parental choice technical environment within Europe. These developments stand in contrast to the tremendous differences in standards and protocols from State to State in the analogue context. These

---

[5] None of the array of Teletext-based delivery modes (packet 8/30, format 1; Video Programming System (VPS); Wide Screen Signalling (WSS); packet 31; packet 31 with embedded slow data rate component) are available throughout the EU's many regions.

[6] Perhaps the delivery mode with greatest reach in Europe is "packet 8/30, format 1". This path has been selected by Philips, for one, as the transmission mode of its TACS system for programme blocking. J R Kinghorn, "Laboratory Report: TACS: A proposal for a TV Access control system based on Teletext", (Philips Semiconductors Systems Laboratory Southampton, England, 21 January 1997). While the prospective reach of this transmission system may justify the product development by Philips and other manufacturers, the unavailability of packet 8/30, format 1 in a large number of regions among the Member States precludes its introduction as a comprehensive parental choice delivery system at European-level.

differences in analogue transmission are, to a significant extent, offset by the television manufacturing industry's efforts to establish technological platforms adequately capacious to operate among the varied environments. Nonetheless, there are important limitations to what can be and has been achieved by the industry on this front and thus cautious policy in this analogue setting is warranted.

2.4 Gateways

Gateways (usually in the form of set-top boxes) will play a vital role in the expansion, within the analogue setting, and in the introduction, within the digital setting, of parental choice mechanisms based upon electronic programme guides (EPG).[7] As is substantiated below, electronic programme guides provide a useful interface for the mobilisation of technical devices in the protection of children. Standardisation of transmission gateways and interoperability with new analogue sets is necessary in the analogue context in order to maximise the accessibility of EPG-based information.

In the digital setting, gateways are pivotal for mobilising the information capacity of digital technology. It is certain that set-top boxes will not only function as the gateway for proprietary subscription services, but will provide the translation of digital signals to analogue televisions. It is anticipated that the diffusion of this EPG information will be vital not only in so far as it informs viewers of content, but also in the way in which it can contribute to the development of third-party rating and information providers. The generation of plural providers is a pivotal matter and is dealt with more fully in the discussion of positive approaches versus negative approaches to parental choice, found in this chapter's concluding section.

2.5 Bit capacity

One of the key interactions between the nature of a technical device and the allowable rating system is “bit capacity” or “bits per second.”[8] Most available analogue devices

[7] For the purposes of the present Study, gateways are to refer to the intermediary technical devices that process transmission signals so that they may be interpreted by a given television receiver.
[8] "Bit capacity" or "bits per second" refers to the available space for data transmission via Teletext. A data packet is the means by which programming information, such as ratings, is delivered to the television receiver. These packets are constituted by bits. The rate of "bits per second", for example, determines the strength or robustness of the signal and thereby effects the level of corruptibility of the signal.

have very little bit capacity, or room for the sending of signals that convey information to the viewer or to the device that is programmed for off-on, blocking or filtering functions. The less the bit capacity and the information that can be conveyed, for example, the more likely the rating or labelling system will be terse and judgmental. Similarly, there is a correspondence between bit capacity and the capacity for grades of nuance among levels or criteria such as violence.

In the digital environment, these bit considerations are no longer. Thus, issues of robustness so significant in analysing analogue possibilities are utterly moot. In the digital environment, the question of bit capacity as contemplated within the analogue domain will essentially evaporate.

2.6 Tamper proof

One important design element, limited by technology, is whether a technical device is more or less impervious to tampering. In analogue, there are acute trade-offs between programme information capacity and signal corruptibility. Possible analogue technical regimes may, for example, allow more information in terms of bit capacity, but are more susceptible to tampering - such as separating the flow of programme related information from the programme itself or by using "time-shifting"[9] to avoid the blocking function.

In digital, the rating and information encoding may be utterly intertwined. The prospects of tampering in the digital context appear much less significant than in the current analogue environment.

3. Technical devices in the analogue setting and standard rating schemes

The following section presents an overview of several of the technical devices that have been discussed in the European marketplace and which are in various stages of introduction. The devices reviewed here have all been developed in the context of

[9] "Time-shifting" refers to accessing programmes intended to be blocked by using intermediate steps. The predominant technique is the child's use of a VCR that is incapable of responding to blocking signals to record a programme for later viewing by the child.

analogue broadcasting. Though, as indicated above, Europe is moving to digital broadcasting, and though digital approaches are making substantial headway, the present is predominantly one of analogue. Even in the future, analogue devices will be important because analogue sets frequently become the legacy of children, as replacement high-technology receivers result in the movement of their antecedents to the bedrooms of the young. In this transition from analogue to digital, gateways that can translate the digital signals in order to be interpreted by analogue receivers will be increasingly ubiquitous. The table on the following page demonstrates the present levels of televisions and computers in children's' bedrooms. As discussed later in this chapter, the likely pervasiveness of legacy sets coupled with the rise in the use of digital-to-analogue and other gateways in children's bedrooms should inform the development of policy during the digital transition and analogue legacy.

As will be seen, each of the devices discussed herein has, because of their technical composition, consequences for the design of a partner rating and labelling system.

Figure 1: Children's media equipment, TV based and PC based

Figure 1 a:Percentage of children with television, video and cable/satellite (a) at home and (b) in own room, by age group (6+)

Country		Television				Video				Cable/Satellite				Games Console			
		6-7	9-10	12-13	15-16	6-7	9-10	12-13	15-16	6-7	9-10	12-13	15-16	6-7	9-10	12-13	15-16
DENMARK	Home	100	98	98	98	91	92	91	95	52	50	55	56	39	49	38	33
	Bedroom	32	58	72	84	12	28	32	50	10	19	28	31	17	32	24	19
BELGIUM*	Home	92	91	97	97	89	84	88	92	-	-	-	-	41	44	69	65
	Bedroom	6	14	30	41	5	9	11	19	-	-	-	-	11	18	22	30
FINLAND	Home	97	92	95	96	92	92	86	93	40	29	32	38	36	50	47	38
	Bedroom	21	30	42	59	6	14	17	22	2	6	8	18	12	25	22	20
FRANCE	Home	99	99	98	100	91	92	92	91	26	26	24	19	48	58	65	59
	Bedroom	16	25	30	40	4	8	14	9	3	2	3	3	14	26	35	25
GERMANY	Home	98	98	100	99	87	84	88	88	74	83	84	87	17	35	39	32
	Bedroom	17	29	48	64	6	6	10	22	6	19	33	46	10	21	24	20
ITALY	Home	-	-	95	95	-	-	81	79	-	-	22	19	-	-	53	40
	Bedroom	-	-	52	54	-	-	19	17	-	-	6	4	-	-	34	24
NETHERLANDS	Home	99	97	100	97	95	92	91	90	-	-	-	-	36	53	58	42
	Bedroom	12	20	39	48	2	2	5	8	-	-	-	-	9	15	23	21
SPAIN	Home	97	92	96	98	77	53	75	85	13	23	25	21	40	46	62	60
	Bedroom	21	27	37	32	7	11	9	10	3	2	3	5	21	29	42	37
SWEDEN	Home	10	96	94	98	97	91	92	93	63	50	64	76	53	64	69	61
	Bedroom	25	37	51	64	8	11	19	35	8	9	22	33	13	32	41	34
UK	Home	85	99	99	97	70	90	91	88	31	37	35	40	43	56	64	54
	Bedroom	50	57	69	75	11	18	24	32	5	2	5	8	24	32	42	36
Average of above EU countries	Home	86	96	97	98	88	86	88	91	43	43	49	45	39	51	53	45
	Bedroom	22	33	47	56	7	12	16	22	5	8	15	19	16	26	33	27

Figure 1 b:Percentage of children with computer without CD-ROM, with CD-ROM and with modem (a) at home and (b) in bedroom by age group (6+)[10]

Country		Computer without CD-				Computer with CD-ROM				Internet Link/Modem			
		6-7	9-10	12-13	15-16	6-7	9-10	12-13	15-16	6-7	9-10	12-13	15-16
DENMARK	Home	70	68	76	80	33	56	61	62	20	27	27	26
	Bedroom	9	25	27	32	3	17	19	26	1	5	5	7
BELGIUM*	Home	53	47	6	68	34	26	63	44	20	16	49	36
	Bedroom	7	10	15	26	2	3	12	16	1	1	4	6
FINLAND	Home	35	33	32	37	33	47	53	47	19	24	30	30
	Bedroom	7	13	12	12	5	14	18	19	2	5	8	11
FRANCE	Home	50	49	58	46	20	11	31	21	7	4	12	5
	Bedroom	17	23	17	16	3	1	8	3	1	1	4	1
GERMANY	Home	12	14	16	19	25	34	44	50	8	8	10	9
	Bedroom	3	6	7	7	1	6	18	26	0	0	1	3
ITALY	Home	-	-	29	33	-	-	37	34	-	-	11	12
	Bedroom	-	-	17	18	-	-	23	20	-	-	5	6
NETHERLANDS	Home	77	86	84	90	39	47	47	48	18	18	15	20
	Bedroom	5	8	14	16	1	2	3	7	1	1	0	3
SPAIN	Home	19	12	15	18	29	31	41	51	3	8	11	11
	Bedroom	5	6	5	7	3	10	13	22	0	1	4	3
SWEDEN	Home	59	50	66	69	27	40	52	55	18	21	33	38
	Bedroom	8	12	23	30	2	8	16	23	1	3	8	13
UK	Home	18	27	21	31	18	27	28	27	4	7	8	7
	Bedroom	7	11	8	14	3	2	6	4	1	1	1	1
Average of above EU countries	Home	44	43	40	49	29	35	46	44	13	15	21	19
	Bedroom	8	13	15	18	3	7	14	17	1	2	4	5

*Belgium: Figures are for Flanders only

Source: Children's Changing Media Environment: Overview of a European comparative study, Dr. Sonia Livingstone, Katherine J. Holden, Moira Bovill, Media Research Group, Department of Social Psychology, London School of Economics and Political Science, 1998.

3.1 Teletext

Teletext provides important examples of technical systems using a direct mode of sending parental choice signalling information in an analogue environment. Several teletext-based systems may be made available within Europe. Two representative Teletext systems, Teletext packet 8/30 and Teletext packet 31, will be discussed in the

[10] These figures are the result of a multidisciplinary, multinational project investigating the diffusion and significance of media and information technologies among young people aged 6-17 years. The project was directed by the British team - Dr. Sonia Livingstone, Katherine J. Holden, Moira Bovill - and conducted by national research teams in eleven European countries (including Switzerland) and Israel. The national approaches followed a common conceptual framework and methodology, incorporating qualitative methods and a large scale survey involving some 15,000 children and young people across the twelve countries during 1997-1998. The book 'Children and their changing Media

immediately following section. A third Teletext-based system, analogue Electronic Programme Guides (EPGs), possesses distinguishing features from the other Teletext systems and thereby warrants a separate discussion below.

Teletext packet 8/30

As it happens, in the current mode of transmission of Teletext, there is a reservation for future use of bytes 22 to 25 designated under what is called "packet 8/30, format 1".[11] According to European Association of Consumer Electronics Manufacturers (EACEM),[12] the optimal data rate to ensure standard error protection[13] would deliver 18 bits per second, which would be sufficient capacity to provide basic parental choice signalling information. This '18 bits per second' scheme is twice the capacity of the North American "V-chip".

Under this Teletext system, the signalling information data is directly transmitted with the TV signal. Because it uses spare capacity in the Enhanced Teletext Specification (ETS 300 706), no new packets are introduced and it can be used in existing teletext hardware. An essential advantage of the Teletext system is that the decoding data can be contained in the same packet. The system is compatible with all existing teletext-appropriate television receivers, though software modifications are necessary. For this reason, the marginal cost of implementing this system is low.

All the news is not good, however. There are problems co-ordinating this particular technology and VCR avoidance as well as in preventing signal corruption from the manipulation of the receiving aerial.

Environment: A European Comparative Study' by Dr. Sonia Livingstone and M. Bovill (Eds.) is in preparation and will be published by Sage

[11] General Secretariat, "Possible methods for implementing parental control signalling in analogue TV systems", (European Association of Consumer Electronics Manufacturers (EACEM), 1998), 3.

[12] EACEM represents the joint interests of companies, national industry associations, associated national federations who manufacture in the countries of the European Union.

[13] Although as much as 32 bits are available in this mode, delivering just 18 bits frees up 6 bits for a error protection safety net to be transmitted simultaneous with the data to ensure that breaks in the primary data transmission will not cause a total failure in the delivery of the information, that a simultaneous transmission with the same information is sent as a back-up.

Under most schemes, the Teletext data is transmitted at a rate much higher than can be recorded on most VCRs. Unless there is a modification of format, of transmission mode or of VCR technology, the parental choice device can be avoided by a child by "time-shifting"; that is, by recording the programme and viewing later.

Technology that overcomes this high Teletext transmission rate problem will soon be introduced to the market. These VCRs will be able to record content data along with the content itself, thereby allowing a blocking function to be performed when the recorded programme is subsequently played back. Thus, the Teletext content data would be transmitted to the television receiver during playback and programming that initially would have been blocked in the direct reception from the transmitter would also be blocked when played as a VHS recording. This technology would be adequately comprehensive if accompanied by a proliferation of television receivers containing Teletext-based parental choice systems. Otherwise, time-shifting can be anticipated to be executed in conjunction with *set*-shifting. After recording an intended-to-be blocked programme, the child would then playback the recording on a television that does not have the Teletext parental choice system. Given the very high level of multiple television households throughout the Member States, this prospect is quite likely and the time-shifting circumvention is not, in practice, likely to be eliminated.

Further, the Teletext signal is easy to corrupt (where the aerial is portable), by moving or shifting the aerial. In sum, it is apparent that the Teletext system can be thought to be imperfect. It is more subject to avoidance through both aerial manipulation and time shifting.

Teletext packet 31

Packet 31 (also known as Independent data lines (IDL), at first blush, provides great versatility and robustness. It may be transmitted as an independent information stream or it may be inserted transparently into existing teletext streams. It can be transmitted on any available line in either field in the VBI. This IDL structure, specified in the "Data Transmission within Teletext" specification (ETS 300 708), is able to deliver up to 36 bytes per packet. The availability of this 36 bytes delivery is merely dependent upon the likely occurrence of otherwise unusable VBI capacity.

However, Packet 31 cannot be carried by all existing networks, is not receivable by the majority of current teletext decoders, and also suffers susceptibility to the time-shifting circumvention.

3.2 Wide Screen Signalling (WSS)

This system, like the most feasible forms of Teletext, uses existing and available European data packets and recorders. It takes advantage of the fact that there is space available in the information packet sent to signal to receivers whether a programme is in a Wide Screen or Normal Screen format. In some settings, this packet of information also triggers a "surround sound" system. The use of this packet approach has advantages over Teletext. Because the information is transmitted more slowly, VCR adjustment to its use is possible. Many of the advantages of immediate use that are characteristic of the Teletext model are available in the WSS context.

There are obvious disadvantages to the WSS system over the Teletext system. The major one is information as provided by the bit data capacity. Because there is only one spare bit of capacity, relatively little information can be transmitted. Thus, if the signal were more than a simple on/off signal, it would have to build up over a number of frames and thereby would increase the response time of the system. This rate of transmission impinges on the room for hardware error integration.[14] While it is true that this system is theoretically compatible with VCR recordation, no VCR decoders fitting this system are in production or use.

There are other of these analogue technical devices, using other pathways; in general, they share similar characteristics in terms of their constraints on the nature of rating and labelling systems that can be operative in conjunction with them and in terms of

[14] "Hardware error integration" refers to the transmission's capacity to send signals to the receiver in addition to and simultaneous with the primary signal. The serial data stream of WSS, a stream in which the signal to be decoded is built up over a series of delivered packets of one bit, has no capacity to send a protection stream as a back-up in case of transmission or reception error in the primary signal's delivery.

their susceptibility to manipulation and avoidance.[15] For these reasons, they present neither feasible nor desirable options at European level.

3.3 Audioband

A French manufacturer, Communications SA, is currently developing a device that would be triggered by signals affixed to the audio band within both analogue and digital transmission modes. This prospective device avoids the very crowded video band and would apparently be readily transmitted from any present broadcaster.

This prospective technology appears to avoid the common pitfalls of most analogue devices designed to function via video band signals. The device is purported to be able to read evaluative information as well as content indicators such as violence level and even a more qualitative description of a violent scene.

Unfortunately, the device is still under development and technically unproven. Further, while it appears there is significant room for information on multiple levels, it is far from certain that the device and its corresponding signal would be able to carry multiple levels of information from *multiple information providers*.

4. Shifting the paradigm: technical devices and plural ratings

The limited pathway and limited bit capacity of most technical devices, including the V-chip, reinforces the tendency toward judgmental rating systems (due to the structural limitations on descriptive qualities), and also encourages single, rather than multiple ratings. Chapter 2's ratings discussion presents these issues exhaustively. Assuming for now that the appropriate goal is a rating and information environment that facilitates both multiple sources of information and nuanced rating and information systems, the task then becomes to identify the technical regime(s) that would permit such a system. In other words, our inquiry in the present chapter is to characterise technical approaches that may be anticipated to enhance parental choice in a de-centralised, more multi-focal manner. Such an approach would be more sensitive

[15] Video Programming System (VPS); packet 31 with embedded slow data rate component; and page-format Teletext are the relevant transmission modes referred to but not discussed here.

to the needs of different social and cultural groups and the needs of different Member States.

An implication of this shift toward a multi-focal approach is that the most useful, viable way to employ the information to be provided in this approach is via an affirmative, selective manner rather than an excluding, negative way. To best mobilise parental choice in this new television information environment would require *seeking* desired content rather than *designating types* of undesired content.

The use of electronic information to determine a list of programmes that will be *filtered in* rather than a list of programmes that will be *blocked out* may be among the consequences of this shift. Such a system might allow third parties to provide an electronic list of preferred programmes in a scheduled fashion. Individual viewers, rather than subscribe to pay services (e.g. Disney or Canal Plus), might subscribe to channels that organise programmes from all available information sources. In addition to determining what level of violence or sexual explicitness might be included, a group, for instance, might select a wider range of programming in French or Italian or more news and fewer "reality" programmes.

4.1 Electronic Programme Guide technologies in the analogue mode

Perhaps the most vital of current possibilities in this direction involves electronic programme guide (EPG) technologies and the adaptation called NexTView, an open standard developed by nineteen multi-national manufacturers of televisions within Europe,[16] starts with the notion of a system designed to give information about specific programmes and schedules, offer means of ordering the recording of programmes in advance and means of facilitating or pre-ordering shifts from one channel to another to organise television use in the increasingly complex multi-channel world.

It is precisely because the system is so enmeshed in programme choices based on information about the programmes that it is adaptable to a parental choice system.

[16] Philips Consumer Electronics, "NexTView Electronic Program Guide gives more information at the touch of a button," *Philips Consumer Electronics Press Releases*, August 1997.

Already, in the minimum service, there is often embedded information about age suitability ratings. By including a decoder, information can trigger a parentally programmed block.

NexTView presents promising technical features and enjoys a virtual consensus among manufacturers as a standard for electronic programme guides. However, its analogue transmission mode shares the corruptibility and reliability concerns that burden other analogue modes. It shares the same corruptibility problems as the other Teletext-based and video-band based technologies discussed above. It suffers reliability problems in that it is a parallel signal, delivered along side the content transmission. As a result of this parallel delivery, the EPG timekeeping may not always map precisely with the actual boundary (i.e. the beginning and ending) of programming. Thus, in blocking scenarios, the suppression process would be based on *expected* transmission time. Similarly, in white-listing scenarios the reception of programmes would be based on the expected time and, in cases when the programme mapping did not correspond precisely with the EPG timekeeping, would run the risk of inadvertently picking up unintended and undesirable programming. The NexTView technology includes Programme Delivery Control (**PDC**), a real-time switching signal which is designed to compensate automatically for imprecise programme delivery timing, allowing for blocking in real time rather than expected time via transmission of a unique PDC code. This PDC code may be sent for each programme, delivered once per second throughout the programme's duration. In the long-term analogue context, this PDC technology will figure prominently in the mobilisation of EPG capabilities as either filter or block. However, at present there is highly uneven availability of PDC signalling by broadcasters in the Member States.[17] Further, there are substantial limitations to using PDC signalling via satellite or cable delivery.[18] Serious reliability

[17] For instance, BBC1 and BBC2 are currently broadcasting a fully operational PDC service in the UK, except for Scotland where it remains experimental. See Wiseman, Andrew. Programme Delivery Control Explained. Internet WWW page: <http://www.users.dircon.co.uk/~bandc/a.wiseman/625/pdc.htm> (version current at 3 Jan 1998). Although PDC is a European standard (despite not being ratified by the EBU), few remaining UK broadcasters have adopted the service and few broadcasters in other Member States have elected to provide this service.

[18] Ibid. The primary difficulty with using PDC on satellite and cable is that to do so requires the changing of the channel to look for the programme identity label (PIL) in order to identify the date, channel and start time of the programme. For most video's, this it is impossible to change the satellite or cable channel.

concerns for services from these delivery modes militate strongly for a cautious endorsement of PDC signalling as a comprehensive solution to the time mapping problem. Nonetheless, carriage of PDC transmissions in analogue should be encouraged among the Member States. PDC does show promise as an important modality that should be anticipated to provide an integral component in the effort toward EPG mobilisation as a parental choice technology in the analogue setting. NexTView's use of this technology potentially as both a filter and block should precipitate its broader pan-European embrace.

Notwithstanding these concerns, the NexTView electronic programme guide provides the best approach within existing and foreseeable analogue possibilities. It provides value to households by facilitating selection and blocking choices and it contributes to the general orientation of television viewers towards programming related information. The premium on programming related information applies regardless of the transmission mode. The changing transmission mode of television from analogue to digital should not bear negatively upon the orientation of households to this information. Rather, the change in the capacity of transmission modes and receivers to provide information should be a spur for emphasising analogue technologies that provide levels of information comparable to what can be expected from the digital environment.

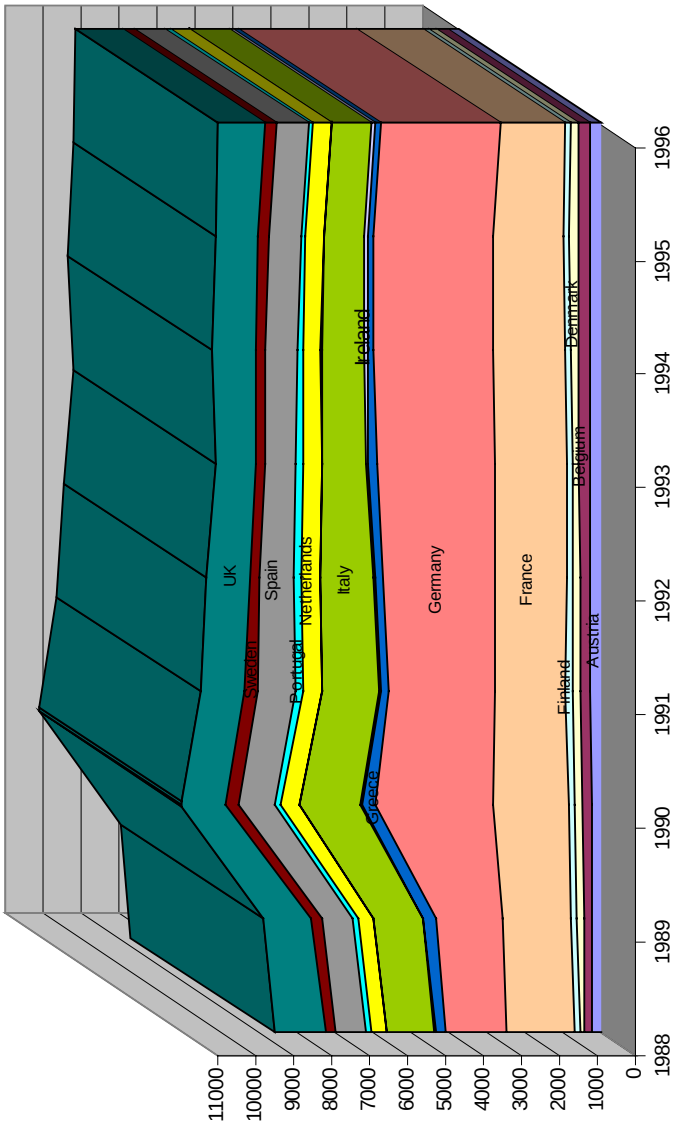
While the NexTView technology relies on Teletext (the various pitfalls of which have been outlined above), it nonetheless provides the best means within the analogue setting for the provision of programming related information. Moreover, within a positive approach to parental choice in which, *inter alia*, specific programming, particular channels, designated timeframes and third-party-provided programme packages are selected from an EPG menu by parents, corruption of the EPGs Teletext signal would completely disable the television. This is starkly different from the use of the EPG under a negative approach. A disabled EPG under a negative, blocking orientation would disable the parental choice mechanism itself and permit all content to make it to the screen. Thus, many of the corruption and circumvention shortcomings in analogue are obviated when EPGs are deployed positively rather than

negatively. An elaborated discussion of the differences between and implications of positive versus negative approaches is provided below.

4.2 Prospects for EPGs in the analogue environment

Our qualified and limited recommendation of analogue EPGs prompts a further inquiry. Namely, what is the present and foreseeable future availability of this technology within European television households? This question of household penetration is multi-faceted. One part of the answer is a function of the anticipated purchasing of TVs with the NexTView open standard. The other part of the answer examines the likelihood of an EPG signal standard for other set-top box gateways. The most sensible way to discuss the NexTView standard's expected presence in European households is to first look at general television purchasing trends and to then consider the likely effects of the availability of digital-only sets on the analogue market and also the anticipated overall market share of NexTView sets.

Figure 2: Household TV set expenditure 1988-1996 in millions of ECUs



NexTView

The determination of NexTView household presence must be based on firstly, the television replacement cycle throughout Europe, and secondly, the predicted levels of NexTView market-share in the new television market. These questions will be addressed in turn.

Reliable figures for the rate of television replacement among European television households are not readily available. Within the UK, between ten and fifteen years is cited. At any rate, the pre-eminence of UK households in terms of rate of spending on TV-sets will bear greatly on the overall market for new analogue televisions.

Figure 3: Household TV set expenditure 1988-1996 in millions of ECUs

Country	1988	1989	1990	1991	1992	1993	1994	1995	1996
Austria	211	233	256	287	277	294	307	297	273
Belgium	200	218	244	254	274	277	284	302	296
Denmark	133	169	186	179	173	178	214	217	207
Finland	165	184	172	191	145	157	152	150	136
France	1768	1790	1984	1859	1897	1894	1876	1850	1745
Germany	1623	1741	3086	2793	2940	3093	3140	3174	3101
Greece	242	323	350	213	218	222	152	159	163
Ireland	54	42	50	52	58	55	94	93	91
Italy	1212	1280	1602	1494	1382	1140	1119	1010	1043
Luxembourg	10	11	12	13	13	13	13	13	13
Netherlands	420	386	457	466	481	477	498	494	512
Portugal	154	144	182	207	220	201	147	135	120
Spain	759	795	949	1026	878	809	822	848	839
Sweden	282	326	326	324	286	240	277	273	277
UK	1361	1243	1160	1184	1134	1061	1148	1109	1263
EU-15	**8426**	**8655**	**10793**	**10343**	**10248**	**10013**	**10180**	**10055**	**9987**

Source: Statistical Yearbook '98, European Audiovisual Observatory.

While UK households will be within the ambit of some of the world's heaviest digital programming saturation, paradoxically they are quite likely to be able to receive analogue signals longer than any other Member State due to their public broadcasting

history and policy commitment to universal access. Thus, whether and, if so, when the combination of Sky's and Ondigital's digital programme offerings will attain a critical mass and effectuate the transition to digital transmission remains an open question. Among the possible implications of this indeterminacy is that it is likely that the NexTView standard will have a healthy market in Europe. For one, the UK's analogue history and likely persistence of analogue transmissions long into the digital era point to a relatively healthy analogue set market. While Philips, a leading manufacturer of televisions within Europe, asserts that by 2000, over 40% of new televisions purchased within Europe will possess the NexTView technology, even a substantially more conservative estimate would warrant the view that this technology will enjoy significant household penetration in the near future.

While figures for European household TV set expenditures generally hover at ten billion ECUs, the level of digital acquisition in the immediate future is not anticipated to cut dramatically into this figure. As a result, it is not unlikely that the NexTView technology will attain a very high profile in European households.

An open standard for analogue EPG signals

Determining the maximum diffusion level of analogue EPGs requires more than pacing through the NexTView household penetration inquiry outlined above. Attaining this determination requires identifying the foreseeable level of set-top box presence within European television households. This examination presupposes the establishment and use of an open (or at least quasi-open)[19] standard analogue EPG signal interoperable with the NexTView protocol. While this should not be flatly presumed, for this inquiry, we will assume an industry-wide requirement or embrace of such a standard.[20] After the immediately following set-top box penetration inquiry, the discussion will return to the merits behind and *likelihood* of establishing and proliferating such a standard.

---

[19] Compare *Directive 95/47/EC of the European Parliament and of the Council of 24 October 1995 on the use of standards for the transmission of television signals*, Article 4(d), wherein the licensing requirements of industrial property rights holders to "ensure that this [license granting] is done on fair, reasonable and non-discriminatory terms."

[20] However, it should be indicated that the weight of evidence supports this conclusion.

To determine the existence of an opportunity to extend the presence of analogue EPGs in European television households, data regarding the penetration of subscription services must be evaluated. While the front lines of the transition to digital are surely in the subscription television territory, it is nonetheless helpful to examine the household penetration rates of cable and satellite (with their accompanying gateways), keeping in mind the dynamics of this transition period.

With subscription services come gateways. At minimum, gateways function to allow subscribers to receive their subscribed services and to prohibit non-subscribers from receiving programming for which they have not paid. These gateways, beyond their conditional access function, can also provide the technical locus for proliferating EPGs to a larger number of analogue households.

Penetration levels for cable and satellite are quite varied throughout Europe. The Benelux countries have very high levels of cable households (Belgium 97%, Luxembourg 95%, and Netherlands 94%). These rates within these small States are roughly double the median percentage of penetration among the remaining States. Denmark (56%), Finland (44%), Germany (44%), Ireland (44.9%), and Sweden (50%) have substantial degrees of cable (and to lesser extents, satellite) penetration, while Italy (0.2%), Greece (less than 1%), Spain (3.6%), and Portugal (11.3%) are outliners in both cable and satellite categories. The combined average of all fifteen Member States for cable households is 39.8%. The average for satellite households is 13.4%.

Figure 4: Household Penetration Rates of TV, Cable and Satellite in 1996/1997

Country	Number of total private households (TPH) in 000s	Television households (TVHH) in % of TPH	Cable households in % of TVHH	*Date*	Households with Satellite in % of TVHH	*Date*
Austria	3282	99%	37.4%	*End 1996*	36.1%	*End 1996*
Belgium	3759	96%	97.0%	*1996*	5.0%	*1996*
Denmark	2328	98%	56.0%	*End 1997*	42.0%	*1996*
Finland	2150	97%	44.0%	*End 1996*	12.0%	*End 1996*
France	22889	94%	9.7%	*Jul-97*	5.7%	*End 1997*
Germany	35272	97%	44.0%	*1996*	30.0%	*1996*
Greece	3646	96%	*	*1996*	1.0%	*1997*
Ireland	868	97%	44.9%	*End 1997*	9.0%	*1996*
Italy	22285	100%	0.2%	*End 1997*	4.8%	*End 1997*
Luxembourg	140	100%	95.0%	*1995*	5.0%	*1996*
Netherlands	6400	98%	94.0%	*End 1997*	4.7%	*Jul. 1997*
Portugal	3574	98%	11.3%	*End 1997*	8.0%	*1996*
Spain	15080	99%	3.6%	*End 1997*	8.2%	*End 1997*
Sweden	3889	96%	50.0%	*End 1997*	10.0%	*End 1997*
UK	21528	97%	10.0%	*Feb-97*	20.0%	*Feb. 1997*
EU-15	147090	97%	39.8%		13.4%	

* Exact data not available, how ever, total number of television households passed by cable is less than 1%.
Sources: European Commission, Information Society Project Office, European Survey of Information Society, January 1998; European Market and Media Guide, December 1997. Market research International, February 1996, Euromonitor.

These significant penetration levels in most States are due, in large measure, to the burgeoning digital market. This digital context is discussed in a later section, but for the purposes of the present discussion it should be noted that the digital market's growth is outpacing the analogue subscription services. Importantly, all pay-per-view broadcasters transmitting in analogue at present are scheduled to transmit in digital mode by the end of 1998. While these channels do not envision ending their analogue transmissions anytime in the near future, and legacy sets should be expected to receive analogue signals for years to come, this is still an important development.

Figure 5: European Pay-per-View operators (excluding sports only), 1997-1998

Country	Operator	Services	Transmission mode		Broadcasting mode		Launch	Channels
			Analogue	Digital	Cable	Satellite		
Denmark	TeleDanmark	Tvbio	x		x		11/1996	1
	TeleDanmark	Tvbio		x	x		2/1998	10 - 12
	Canal Digital/TeleDanmark	Kiosk		x		x	3/1998	24
Finland	Canal Digital	Kiosk		x		x	3/1998	24
France	Canal Satellite	Kiosque		x		x	4/1996	10
	CGV Cable	Kiosque		x	x		4/1996	10
	Lyonnaise Cable/FT Cable	Multivision		x	x		1994	2
	Télévision Par Satellite	Multivision		x		x	11/1996	7
Germany	DF1	Cinedom		x		x	7/1996	16
	Deutsche Telekom Cable	Cinedom		x	x		7/1996	8
	Deutsche Telekom Cable	Premiere PPV		x		x	11/1997	4
Italy	Telepiù	Telepiù PPV		x		x	3/1998	8-12
Netherlands	A2000	Moviehouse	x		x		3/1997	5
	Casema	Casema Plus	x		x		3/1997	6
	Mediakabel	Mediakabel PPV		x	x		11/1998	14
	Canal Plus Nederland	Canal Plus PPV		x		x	1998	?
Spain	Canal Satélite Digital	Taquilla		x		x	3/1997	25
	Via Digital	Canal Palco		x	x	x	11/1997	5
Sweden	Svenska Kabel-TV	Bio Hemma	x		x		1/1996	4
	Svenska Kabel-TV	Bio Hemma		x	x		7/1998	10-12
	Canal Digital	Kiosk		x		x	3/1998	24
UK	Telecential, Comtel	Take One	x				12/1997	4
	TeleWest, NTL, Diamond Cable, General Cable	Front Row	x		x		7/1998	4
	BSkyB	Sky Box Office	x			x	12/1997	4
	BSkyB/Cable & Wireless Communications	Sky Box Office		x		x	1998	40-50

NB. By the end of 1998 all analogue Pay-per-View broadcasters will start transmission in digital mode in addition to analogue. This does not mean, however, that analogue pay-per-view will cease to exist. On the contrary, the conversion of the existing analogue subscriber base will be a long process in those markets which have not yet launched digital.

Source: Statistical Yearbook '98, European Audiovisual Observatory.

Perhaps of greater significance, many of the new digital satellite stations are transmitting in digital mode *solely*. Nonetheless, simultaneous analogue and digital transmissions should co-exist for many years into the future in most Member States. The scheduled shut-off of analogue signals has been mandated in several States (e.g. Germany 2010, Spain 2012 or earlier, Sweden 2008), however the persistence of analogue signals as the predominant transmission mode for many if not the majority of European television households does not seem to be in jeopardy for a number of years. In the context of the present discussion, it is noteworthy that this predominance does not necessarily correspond to an increase in subscription services and their corresponding gateways. The likely persistent analogue signal broadcasters will be the traditional terrestrial channels, located in countries like Italy were terrestrial analogue provides what is commonly deemed as a sufficient array of programming. In these areas, the incentive to seek services that would introduce gateways to households is lacking.

It is readily apparent that speculating on the trajectory of analogue subscription services is precarious given the present state of flux outlined above. At a minimum at this juncture, it does not appear prudent to anticipate that analogue gateways will be increasingly introduced into households at a significant level. Whether this consideration supersedes the potential benefits of standardising analogue EPG transmissions in conjunction with other analogue initiatives is not necessarily certain. As indicated above, the NexTView open standard is likely to have a significant penetration within the European market.

Despite these less than compelling findings regarding analogue gateways penetration, establishment and use of an open, or at least quasi-open, standard analogue EPG signal is still worthy of further consideration. While the above gateways discussion does not clearly point to an increase in analogue gateways, it does not conclusively indicate a decline. Further analysis may indicate that it would be sufficient impetus to facilitate signal standardisation merely if the current analogue gateways household penetration levels sustain.

In the past, Directives concerning television transmission standards have been promulgated with the aims off generating a single European broadcast market.[21] While these Directives did not achieve this goal,[22] the prospect of standardisation attaining less ambitious aims should not be deduced from this failure.

With this said, the remaining substantial question is whether promulgating an open standard interoperable with the NexTView standard would be economically onerous for any of the implicated industries. Given that EACEM, the consortium of television manufacturers, have adopted the NexTView standard, manufacturers should not be anticipated to suffer injury due to such standardisation. Similarly, broadcasters are also free to adopt the open NexTView standard. Whether such adoption is overly costly to the broadcaster is a separate matter, but the market leverage the NexTView standard is likely to attain in the analogue domain should be anticipated to warrant broadcaster adoption of this standard regardless of whether more interventionist measures are taken. Thus, it appears that market pressures alone may very well obviate regulatory action on this front.

4.3 Voluntary EPGs as a primer for the digital environment

In spite of the outlined limitations of the technology as a blocking mechanism, facilitating a voluntary analogue EPG environment in anticipation of a more technically robust digital environment may serve several purposes. First, it is likely to contribute to the orientation of parents and children to the use of this sort of technology and, more importantly, to the use of the accompanying programming related information. Second, it can contribute greatly to the generation of plural rating and programming related information providers.

---

[21] See Commission of the European Communities, *Directive on the adoption of common technical specifications of the MAC/packet family of standards for direct satellite television broadcasting,* 86/529/EEC, see also, European Commission, *Directive on the adoption of standards for satellite broadcasting of television signals,* 92/38/EEC.

[22] Richard Collins observed that "… the Directives on television transmission standards … express the dominant assumptions in the Community of the early and mid 1980s; that a single broadcast market would unify the Community culturally (and therefore politically) and would assist the development of the Community's audio-visual hardware and software industries. However, neither Directive established the single market which they were conceived to implement (*Broadcasting and Audiovisual Policy in the European Single Market.* (London: John Libbey, 1994, p. 114))," quoted in D. Goldberg, T. Prosser, and S. Verhulst, *EC Media Law and Policy* (Essex: Longman, 1998), p.54.

Given that the digital transition will progress over many years and that both analogue transmission and analogue receivers will persist in Europe for decades into the future, policy should strive to import the promise presented by digital technology to the foreseeable analogue future. To this end, extant EPG technology within analogue should be anticipated to be increasingly pervasive and, in several ways, an adequately robust means of delivering a level of *information* comparable to that enabled within the digital setting. The greatest shortfall of EPGs as a parental choice mechanism in the analogue setting is their vulnerability to circumvention. EPGs in an analogue setting represent, if not an invulnerable prophylactic, at least a valuable precursor to technically more sound parental choice mechanisms to be found in the digital setting.

As discussed above, standardisation of signals for programming related information is essential to ensure that the presently proprietary configuration of set-top boxes and other gateways converge to share standards for the transmission of signals concerning rating and programming information. As in the case of the United States,[23] industry groups should be allowed to lead (either by market forces, policy articulation or a combination of both) in the designation of digital and analogue signal standards at European level. The formal standardisation of transmission signals can be seen to subsequently effectuate a de facto standardisation among manufacturers of receiver devices. In the European digital arena, DVB and DAVIC have achieved a tremendous level of standardisation.[24] This trend should be further encouraged so as to ensure the establishment of a European API standard.

A second desirable outcome of encouraging the proliferation of analogue EPGs is that it can provide what would amount to an incubator function for plural rating and programming related information providers. The promotion of plural providers (as discussed in Chapter 2) should be permitted to become a defining feature of parental choice within the digital context. The analogue EPG is a useful predecessor to the future digital environment. The information capacity of analogue EPGs is comparable to the capacity within the digital context. Similarly, abundant capacity to store

[23] Federal Communications Commission, *In the Matter of Carriage of the Transmissions of Digital Television Broadcast Stations,* CS Docket No. 98-120, Released July 10, 1998.

information and the significant integrity of the signal as a parental choice mechanism mobiliser are anticipated to be indispensable properties for prospective digital devices serving the multi-national, multi-cultural Europe. Thus, the technical capacity to transmit signals encoded with information provided from multiple sources is within reach. However, in order to have these plural providers of rating and programming related information, the generation of a place and function for these third parties must begin well before the transition is complete. The corresponding need for information providers in addition to at least supplement the traditional, monopoly rating providers will steadily increase with the growing volume of programming.

A seamless vocabulary: reaching a common descriptive criteria

The analogue third-party providers' role should be crafted to allow a seamless transition to the digital forum. To this end, structuring the format of ratings and programming related information in correspondence to the envisaged technical platform is an appropriate measure. Given the anticipated latitude within the expected protocols or "syntax",[25] such structuration should not effect the functioning of programming related information providers within the analogue setting. Because the fundamentals of an information system are the vocabulary or basic explanatory elements, establishing a rating vocabulary is of a high order for ensuring a seamless transition from analogue to digital in the provision of rating and programming related information. Such a vocabulary will be needed to provide the vitally important common descriptive criteria at European level. Again, the technically imposed restrictions upon such a vocabulary should not prove to be overly limiting. Rather than present these considerations in the abstract, the further explication of a rating vocabulary is provided within the digital framework discussed below.

4.4 Information as an alternative to technical devices

The technical limitations of the analogue environment preclude compulsory adoption of any technical regime. Nonetheless, this study appreciates the multiple benefits of

---

[24] See, *infra*, the discussion in footnote 57, of the fallout among consumers over the row between BDB and BskyB over digital interoperability.

[25] "Syntax", in this case, represents the grammar for the embedded labels that form the fundaments of the descriptive language for rating and programme information. The primacy of this technical

encouraging the use of EPGs. Above all else, though, EPGs within the analogue setting must be appreciated for their functioning as an *alternative* to technical devices. It is not the capacity of this analogue technology as a blocking or filtering mechanism that militates for its broader availability among Member States. Rather, it is the technology's premium on information that is ultimately most compelling. Whether EPGs may be trusted as a signalling system, as outlined above, in an important sense is beside the point. No technology in analogue can be totally depended upon. The technical capacity latent in the digital future enables the deployment of an optimal rating/information environment as a signalling medium for parental choice mechanisms. Such an environment is necessary to address the culturally and socially variegated European Union. However, in the foreseeable digital future, *selection* of programming rather than the attempt to exclude undesired programming is the most viable way in which parental choice mechanisms may be expected to be used.

In conclusion, the importance of endorsing this technology in the analogue setting is three-fold. First, it allows for the voluntary use of a technical device (probably the best analogue option albeit one that is ultimately too susceptible to circumvention). Second, it provides a way to orient parents and viewers to both the kinds of rating and information that should be made available to viewers as well as acclimates them to plural (i.e. non-State, non-monopoly) rating and information sources. Third, the provision of more detailed programming related information is the best alternative policy to a problematic analogue setting.

5. Technical devices in the digital setting

While substantial digital availability across Europe is far off and the recently established technical protocols and standards are subject to change in the ensuing years, the promise of a technical capacity to store and provide multiple rating and information sources in a transmission mode with low vulnerability to tampering should not be ignored. Hence, an elaboration of the relevant Digital Video Broadcasting Project (DVB) and the Digital Audio-Visual Council (DAVIC) standards are provided

---

grammar can best be appreciated from its role in the Internet-based PICS (Platform for Internet Content Selection) system. Syntax provides the genetic coding for the expression of metadata.

herein in order to substantiate this Study's basic recommendations concerning the establishment of technical protocols.

Preliminarily, the Study indicates that the establishment of these standards under the onus of DVB and DAVIC should be anticipated to ultimately address the relevant technical considerations adequately. This, in turn, should provide a technical platform that may enable the introduction of Europe-wide common description criteria. Such a common criteria may permit the evolution of an optimal rating and programming related information environment at European level. The contours of the present and recommended rating and programming related information environments are outlined in the following discussion.

5.1 Digital television at present

As indicated in the Executive Summary, the digital future poses a transformative opportunity for parental choice signalling information. The architecture of digital signalling expands the way from a unitary and centralised rating system to one that is multiple and largely non-governmental. The very specific flaws that are characteristic of the analogue environment are not present in the digital era. The digital "pipe" that ties the receiving set to a source or sources of information about the programme is very substantial, in many respects beyond comparison to analogue levels of receiving data flow. If a lesson may be learned from the United State's V-chip experience, it is that establishing standards within an analogue setting greatly constricts what is possible in the ensuing digital setting. The digital standards established under the onus of the US's Consumer Electronics Manufacturers Association (CEMA) have regrettably inherited the limitations of the preceding analogue system. Consequently, the rating regime structured around the carrying capacity in Closed Caption has constrained the subsequent digital transmission standard to using only a fraction of its information capacity. Fortunately, Europe is not inhibited by such a legacy. Were the converse the case, it would be hard to envisage a viable European approach to parental choice mechanisms. Europe's multi-cultural constitution requires a more sophisticated technical architecture in order to carry the information of multiple rating providers.

These ratings considerations, however, presuppose the actual deployment of digital television. Incrementally, digital television is becoming a European reality (see Figure 6). This is indicated, in part, by the dramatically increasing percentage of satellite households within the UK (due to the onset of digital satellite stations courtesy of *Sky* and *Ondigital*), and the substantial proliferation obtaining in other States as well. *Premiere* of Germany and Austria has added a significant number of subscribers in the past few years as have the various *Canal Plus* satellite stations dispersed throughout Europe. In Spain, a newer satellite station, *Cineclassics/Cinemania*, had a tremendous growth rate of 139% between 1995 and 1996 alone. (See "Broadcasting mode of pay-TV channels and subscription growth rate"). It is important to note that several satellite stations, particularly the *Filmnet* channels in Belgium, and Scandinavia and *Sweden's TV1000* have suffered precipitous declines in the past years. Nonetheless, the aggregate trajectory for increased penetration for subscription services is ascending.

Figure 6: Broadcasting mode of Pay-TV channels and growth of subscription, 1993-1997 in thousands[26]

Country	Channels	Broadcasting mode			Launch	1993	1994	1995	1996	1997	Growth 1996-97	Growth 1995-96
		Terres-trial	Cable	Satellite								
Austria	Premiere		x	x	02/95	32.0	42.0	51.8	67.0	-	n/a	29.3%
	Teleclub	x	x	x	4/94	-	-	-	-	-	n/a	n/a
Belgium	Canal+Belgique	x	x		9/93	149.8	161.7	171.6	181.3	181,5	0.1%	5.6%
	FilmNet Vlaanderen		x		12/89	165.0	185.0	200.0	157.0	-	n/a	-21.5%
	Canal+Vlaanderen		x			-	-	-	159.2	161.0	1.1%	n/a
	Supersport		x		1995	-	-	80.0	-	-	n/a	n/a
Denmark	FilmNet Scandinavia			x	9/89	80.0	100.0	52.0	-	-	n/a	-42.2%
	Canal+Denmark		x	x	9/01	-	-	-	-	-	n/a	n/a
	TVS	x		x	2/01	-	-	-	-	-	n/a	n/a
Finland	FilmNet Scandinavia			x	6/90	42.0	48.0	65.0	50.0	-	n/a	-23.1%
	Canal+Finland		x	x	09/01	-	-	-	-	-	n/a	n/a
	PTV				1996	-	8.0	14.0	-	-	n/a	n/a
France	Canal+	x	x	x	11/88	3708.4	3870.0	4070.0	4466.9	4593.2	2.8%	9.8%
	Cinécinémas		x	x	1/95	195.0	293.0	375.4	421.0	-	n/a	12.1%
	Cinécinéfil		x	x	1/95	170.0	267.0	340.9	384.0	-	12.6%	12.6%
	Multivision		x	x	6/98	-	-	-	-	-	n/a	n/a
Germany	Premiere		x	x	02/95	723.0	860.0	1011.9	1337.0	1455.0	8.8%	0.0%
Greece	TV Plus			x	12/92	6.0	6.0	-	-	-	-	n/a
	Filmnet		x	x	10/98	-	3.0	-	-	-	-	n/a
Italy	Telepiù	x		x	6/95	544.0	650.0	800.0	-	-	n/a	n/a
	Tele+				8/01	-	-	-	865.9	868.2	1.3	n/a
Netherlands	FilmNet Nederland		x		3/89	155.0	180.0	190.0	-	-	n/a	n/a
	Canal+Nederland		x	x	8/01	-	-	-	166.4	224.1	34.7	n/a
	Supersport		x		1994	-	-	150.0	-	-	n/a	n/a
Spain	Canal+España	x	x	x	9/94	767.6	969.6	1204.6	1366.1	1464.9	7.2%	13.4%
	Cineclassics			x	6/98	-	21.0	41.0	98.0	-	n/a	139.0%
	Cinemania			x	6/98	-	21.0	41.0	98.0	-	n/a	139.0%
Sweden	FilmNet Scandinavia			x	6/90	185.0	215.0	200.0	148.0	-	n/a	-26.0%
	Canal+Sweden		x	x	9/01	-	-	-	-	-	n/a	n/a
	TV1000		x	x	12/93	305.0	288.0	296.0	235.0	-	n/a	-20.6%
	FilmMax				9/96	13.0	12.0	-	-	-	n/a	n/a
UK	The Movie Channel			x	3/94	351.2	356.0	-	4006.0	-	n/a	n/a
	Sky Movies		x	x	2/93	576.2	560.0	-	-	-	n/a	n/a
	Sky Movies & TMC			x	1994	1800.0	3000.0	3085.0	4068.0	-	n/a	31.9%
	Sky Sports 1		x	x	1994	-	2800.0	3123.0	4176.0	-	n/a	33.7%
	Sky Sports 2		x	x	1994	-	-	-	-	-	n/a	n/a
	Disney Channel		x	x	1994	-	-	2792.0	3850.0	-	n/a	37.9%
	Zee TV		x	x	1994	-	80.0	95.0	130.0	-	n/a	36.8%

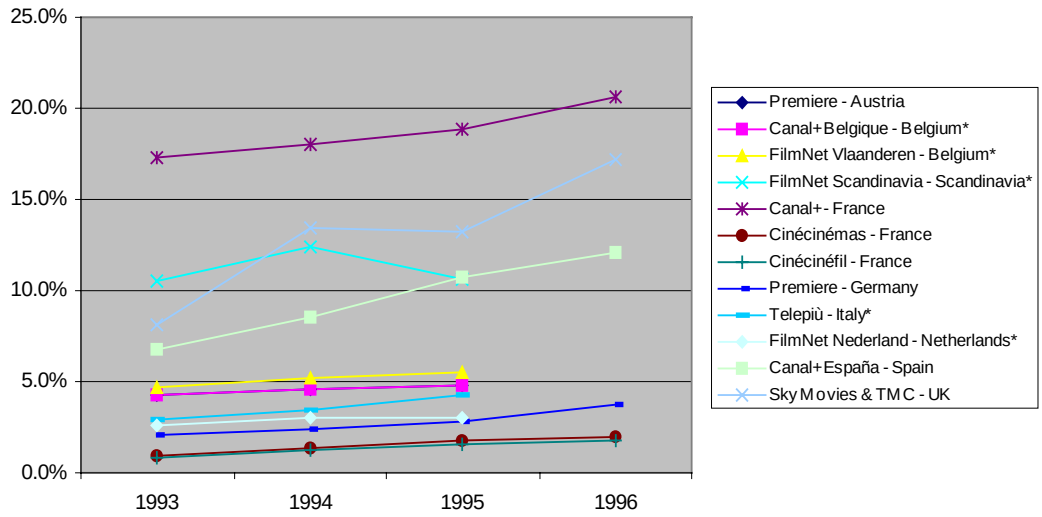
* figures not available

NB All of these channels started transmission of their signals in analogue mode, the majority is, however, progressively moving towards digital transmission. Due to the current transition period it is difficult to say which stage of a trial or implementation phase each of these channels has reached.

Source: Statistical Yearbook '98, European Audiovisual Observatory.

[26] Portugal has two pay-tv services (Tele Cine 1 and Tele Cine 2) provided by the cable operator TV Cabo since 1997 but figures for subscribers are not available. Luxembourg is not included in this list as there are no pay-tv services; it is possible that some households subscribe to foreign pay-tv (Canal+, Canal+ Belgique) in which case they are included in the figures for the country providing the service. The same goes for Ireland where households may subscribe to BSkyB; subscribing households will be included in the figures for the UK.

Figure 7: Growth in TV households subscribing to selected pay-TV services, by channel and country, 1993-1995/96



* Data for 1996 not available

Initial efforts within Member States may be examined to determine whether useful directions are being taken. Within several of these new digital services, basic blocking services have been made available. An overview of the available blocking modalities provided in these different digital channels follows. It must be noted that these initial steps severely under-use the technical capacity inherent within the digital setting. This under-use, to a significant extent, is a function of the lack of rating and programming information.

Present digital blocking modalities

In Germany, for example, there are two digital satellite channels, *Premiere* and *DF1*. *DF1* uses a set-top box named the "d-box". This gateway enables blocking of specific programmes as well as entire channels through an EPG menu. This particular "d-box" has received heavy criticism within Germany because of its complexity.[27] It has been

[27] The umbrella organisation for German media regulators, Direktorenkonferenz der Landesmedianananstalten (DLM), commissioned the Jugend Film Fernsehen Institute to investigate the

criticised as being difficult to use. While this technology is accessed through an electronic programme guide, the absence of a specific menu for the "protection of minors" mode has lead parents to describe the use of the device as “uncomfortable” and “impracticable”. The problem does not appear to be the rating system or information itself, but rather the interface which parents must employ to act upon that information.

In Spain, the satellite platform of *Via Digital* is a useful example of a pioneering digital technology. Beyond requiring a smart card in order to decrypt the signal, this digital satellite platform provides an EPG with filtering software. The present filtering possibilities through this EPG are very basic. Parents may lock particular channels or block programmes according to three options: one of two age group ratings (age 14 or age 18), or according to sexual content. If age group 18 is selected, then the programmes labelled as having sexual content are also automatically filtered. This is an example of the use of an information-poor rating system with an information rich digital platform. Similarly, Spain's *Canal Satelite Digital (CSD)* requires a satellite dish and set-top decoder. The decoder includes an EPG navigation software. The main menu of the EPG allows parents to lock entire channels.

Sweden is also experimenting with digital broadcasting and its relationship to parental choice mechanisms. Terrestrial digital network television is to be introduced in January 1999 and the Swedish government designs to completely phase out the existing analogue during 2008.[28] While information concerning parental choice mechanisms and detailed information regarding electronic programme guides are not presently available, SVT, the State-owned television company, has indicated that EPGs should be neutral, national and include all distribution modes (terrestrial, cable and satellite).[29] The SVT also recommends that the EPGs should possess links to EPGs for all the

---

possibilities for technical devices applicable to digital and encoded television programmes. This investigation unambiguously criticised the utility of the d-box: "Technical devices for protection of minors irrelevant to practical parental guidance". Helga Theunert, *Jugendschutz im digitalen Fernsehen: eine Untersuchung der Technik und ihrer Nutzung durch Eltern.* Publications of *Die Landesmedienanstalten*, no. 11 (Berlin: VISTAS, 1998.)

[28] "Sweden Digital Television Network Rollout Decided," *FT Asia Intelligence Wire*, March 23, 1998, Business section.

[29] Ibid.

other Nordic countries to facilitate the Nordic States becoming a single market, potentially countervailing broader European imperatives.[30]

The Swedish national broadcaster recommends that suppliers of services and equipment decide on a common standard for decoders, thereby allowing Nordic viewers to receive broadcasts from all of the distribution modes. At present, there is a lack of standardisation among the three modes of distribution as well as within the cable and satellite modes individually. Again, the Swedish are recommending that decoders be standardised not only within and across transmission modes, but also among the Nordic States.[31]

Within the UK, the emphasis has been on introducing digital terrestrial television as outlined by the UK Government in the Broadcasting Act 1996.[32] Digital Terrestrial *(DTT)/Ondigital* was launched 15 November 1998; Digital Satellite *(Dsat)/SkyDigital* started its services in October 1998; and Digital Cable *(Dcab)* is expected in early 1999.[33] Concerns were recently aired, mainly by the BBC, concerning proprietary operating systems that will not work satisfactorily with free-to-air services on a competitor's platform. Oftel (the Office of Telecommunications) therefore clarified that any integrated television set that cannot receive and display all free-to-air services, with full functionality, will be in breach of the *Advanced Standards Television Directive* and associated regulations.[34] Full functionality for free-to-air services can be achieved by embedding in sets the open standards selected by Britain's network broadcasters.

At present, *Sky Digital* EPG is, to an extent, representative of the way in which EPGs can function as parental choice devices. The EPG provides a title and synopsis of each movie/episode; it provides BBFC (British Board of Film Classification) movie certificates; and it has "Reason Code" fields with high levels of Sex, Violence,

---

[30] Such a regional orientation may be seen to transgress the European Union's internal market principles. " The Treaties establishing the European communities as amended by the Treaty on European Union and the Treaty of Amsterdam".
[31] "Sweden Digital Television Network Rollout Decided," 23 March 1998.
[32] United Kingdom, Parliament. *Broadcasting Act 1996, Chapter 55*, 24 July 1996
[33]. "Special Survey of Technology and Entertainment: Wheel of Fortune," *The Economist*, November 21, 1998.
[34] "BBC says Digital Televisions Must Guarantee Viewers Access to All Services," BBC Press Release, 14 October 1998.

Language or Mature Themes. An S,V, L and/or M can be indicated in the Reason Code field on a voluntary basis. The *Sky* EPG has also its own parental choice device, allowing parents to require a PIN to be entered in order for particular programmes or channels to be viewed. In addition it also allows parents to set a threshold price for pay-per-view events such that if an event exceeds that threshold, a PIN number is required to purchase the event.[35]

5.2 The future of digital parental choice systems

The present array of blocking and filtering devices within the digital context do not fully exploit the technical capacity inherent within this environment nor do they give a full sense of the digital future from the point of view of enhanced parental empowerment. In the future, the screening, filtering and blocking environment (as indicated above in the discussion of Electronic Programme Guides and NexTView), will become more plural, more organised by groups in society, more voluntary, and more varied.

The major current effort to develop the technical standards to make this possible, as alluded to earlier, is the Digital Video Broadcasting Project (DVB). This is an organised effort to establish European standards that may provide a platform for the optimal use of digital technology in presenting programming related information and effectively deploying parental choice mechanisms.

DVB's Service Information system

DVB, constituted by over 220 broadcasters, manufacturers, network operators and regulators, was formed with the aim of establishing at a global level a "family of standards" for the delivery of digital television. DVB has provided a standard, MPEG-2, for the compression of image and sound data prior to transmission.[36] This digital standard was created with the goal of providing high levels of commonality and compatibility among the four digital TV formats i) Limited Definition, ii) Standard Definition, iii) Enhanced Definition and iv) High Definition.

---

[35] Sky digital homepage. WWW page: <http://www.sky.co.uk/digital/skyguide.htm>.

Within this MPEG-2 architecture, the DVB also has a standard for viewer/signal interactivity. This standard, called Digital Video Broadcasting - Service Information (DVB-SI) intimates the programming information possibilities available within the digital setting.[37]

DVB Service Information is designed to "act as a header" for MPEG-2, the digital containers of compressed image and sound described above. DVB-SI establishes the point of contact with any type of digital receiver, indicating the technical nature of the attached MPEG-2 container. This "header" function, by its purpose of identifying programmes, is a primary step in mobilising any blocking or selecting technology.

The DVB Service Information system can be used by the decoder and the user to navigate through the array of digital services offered. DVB-SI adds information that enables automatic tuning (via a DVB Integrated Receiver Decoder (IRD)) to particular services and allows services to be grouped into categories with relevant schedule information. These latter categories can be conceived as "bouquets". The DVB-SI table architecture, discussed below, has established a specific protocol for this bouquet function.[38]

Thus, DVB-SI is partly dedicated to providing a foundation for a digital Electronic Programme Guide[39] and also to providing the capacity for distinct encoding for each

---

[36] "Implementation Guidelines for the use of MPEG-2 Systems, Video and Audio in Satellite, Cable and Terrestrial Broadcasting Applications," *DVB Standards and Bluebooks, version 1.1,*DVB Document A001 rev 4, July 1997.

[37] "Specification for service information (SI) in digital video broadcasting (DVB) systems," *DVB Standards and Bluebooks, version 1.1,*DVB Document A038 March 1998.

[38] This bouquet architecture may enable the positive approaches suggested under section 7 of this chapter. "Specification for service information (SI) in digital video broadcasting (DVB) systems," *DVB Standards and Bluebooks, version 1.1,*DVB Document A038 March 1998: 27-32.

[39] The manner of presentation of the information is not specified, and IRD manufacturers have freedom to choose appropriate presentation methods. It is expected that Electronic Programme Guides (EPG) will gee a feature of digital TV transmissions. The definition of EPG is outside the scope of the SI specification, but the data contained within the SI specified here could be used as basis for an EPG. The present specification describes Service Information (SI) for use in broadcast MPEG-2 bitstreams. The MPEG-2 System layer specified SI which is referred to as Programme Specific Information (PSI). The PSI data provides information to enable automatic configuration of the receiver to demultiplex and decode the various streams of programme within the multiplex. [Digital Video Broadcasting: Specification for Service Information in DVB systems. Scope and field of application]

State.[40] Hence, the DVB Service Information protocol provides the beginnings of a platform for programming related information in the European digital TV environment. The DVB-SI standard, as is the goal for any interoperability standard, provides the minimum technical specifications for basic interoperability. More sophisticated EPGs can be layered on to this foundation through a data service or a particular receiver interface.[41] This SI would allow applications running on a set-top box to use the DAVIC Service Consumer System specifications.[42] Applications would need these specifications in order to implement electronic programme guide applications that are not built into the particular set-top box but can be "dynamically downloaded".

These technical trends strongly indicate that EPGs, while vital in the present analogue transition, will provide an even greater function in the digital environment regardless of their prospective use as parental choice mechanisms. EPGs are the perceived means for making sense of and navigating the volume of channels and programming will be available within the digital setting. Thus, viewer familiarity with this interface will be a patent feature of digital television. Also, a user-friendly and straightforward EPG/parental choice design should be anticipated to arise from these consensually based protocol and standardisation efforts.

Returning to the particular technical concerns implicated by parental choice mechanisms, the DVB-SI platform is necessary for ensuring the universal access of programming related information regardless of the source of the information or the transmission location of the corresponding programming. This SI architecture may

---

[40] Thus, specific ratings as determined within a given Member State may retain their connection to that State. However, this technical feature cannot, by itself, address the issues of providing rating information for programming from one state in accordance with another State's standards and criteria. In other words, programming originating from State A and assigned a rating by State A's rating entity may be delivered within State B without any evaluation using State B's rating criteria even though the technical capacity to affix this rating information exists.

[41] "Specification for service information (SI) in digital video broadcasting (DVB) systems," *DVB Standards and Bluebooks, version 1.1,*DVB Document A038 March 1998: 13-25.

[42] DAVIC is a non-profit Association based in Switzerland, with a membership of over 175 companies from more than 25 countries. It represents all sectors of the audio-visual industry: manufacturing (computer, consumer electronics and telecommunications equipment) and service (broadcasting, telecommunications and CATV), as well as a number of government agencies and research organisations.

provide the capacity for the desirable level of programme information within the multi-cultural European context.

However, in addition to the DVB-SI protocol, a deeper level of interoperability must be achieved in order to realise the optimal technical environment. While significant strides toward comprehensive interoperability recently have been made, remaining steps must be taken. The following discussion outlines some of these steps necessary to attaining an optimal technical environment.

5.3 Movement to presentation layer interoperability

In digital television, the application programme interface (API) is essentially an application execution engine. In other words, it serves a somewhat analogous function to a computer's operating system. The establishment of API interoperability is needed to enable broadcasters to develop interactive applications that can run on different receiver and set-top box platforms across Europe.

This API interoperability is required in order for a digitally based parental choice regime resembling what has been outlined in the preceding pages. Attaining this interoperability is, in principle, a core goal of both DVB and DAVIC. As efforts to create Europe-level interoperability are afoot, there is a simultaneous effort by some of the more powerful players and industry groups to create a global standard for presentation layer interoperability.[43] For European policy makers, it is beside the point to anticipate which standard would be adopted if this global effort ultimately were to succeed; Europe has the opportunity to select a viable, open platform. Such leadership likely would militate strongly against subsequent efforts by the likes of Intel or Microsoft to establish a global standard incompatible with even a nascent European standard, assuming that such an European protocol was not encumbered by onerous licensing royalties and was not prohibitively costly or memory intensive. However, this assumption that a European protocol would avoid these licensing and technological pitfalls requires greater scrutiny. As of late, the effort in Europe to obtain this

[43] Intel, Microsoft, and America's Advanced Television Systems Committee (ATSC) are at the forefront of the effort to establish a global standard, see "Field report," *Broadcast Engineering* (March 1998).

standard has grown more contentious and problematical.[44] DVB has recently articulated the group's aspiration to establish a protocol with a next-generation API, focusing upon creating a Java-compliant protocol with three separate profiles: "enhanced broadcasting", "interactive TV", and "Internet access."[45] Superficially, at least, these developments signal important progress toward finally creating a standard. However, the backdrop upon which these developments are set makes the scenario more complicated.

As recently as March 1998, a different sort of consensus was in operation. DVB's working parties on interactive TV had reached a consensus: The DAVIC, MHEG-5 standard would provide the future for digital in Europe. However, shortly after this inchoate consensus was made apparent among broadcasters, Canal Plus announced its embrace of a version of MHEG-5. Rather than a critical endorsement, this move was perceived by the broadcasting community to be an attempt to usurp this non-proprietary standard. This profound apprehension amplified the scepticism concerning MHEG-5's technical capacity to deal with an increasingly Internet-based environment.

Curiously, this scepticism of MHEG-5's technical prowess did not translate into greater support of a Java-based API. The robust Sun/Javasoft solutions are perceived with perhaps even more critical eyes. The cost and hardware requirements of the memory-hungry Java-solutions make many in the industry nervous. Most important is the uncertainty over whether the proprietary Java can be a quasi-public standard with licensing royalties at a level that will not prevent its broad adoption. Clearly, creating an API standard has become a less-than straightforward endeavour.

---

[44] In addition to the difficulties surrounding the operation layer protocol discussed here, establishing more rudimentary interoperability in digital signalling and receiving, at State levels, has also suffered substantially from the conflicts between proprietary interests. For instance, the row between British Digital Broadcasting (BDB) and BskyB over set-top box, conditional access systems and EPG interoperability has had, at least at this early stage, a somewhat chilling effect on the consumer approval of digital services as indicated by the opinion poll conducted by NOP Media. See "UK: Consultant's report points to digital confusion ITC to resolve Sky/BDB dispute" *Interspace*, 6 May 1998. This poll, conducted in April 1998, showed that 50 per cent of consumers intend to wait for a set-top box or integrated digital TV that can receive all platforms. Thirty per cent of NOP's sample intended to wait until the issue of compatibility is resolved. NOP Research Group, Public opinion surveys archives. WWW page: <http://www.nopres.co.uk/Archive/publicopinion.htm>.

[45] "The DVB Interactive TV Debacle," *Inside Digital TV*, 14 December 1998, sec. no. 8.

In November 1998, DVB officials met in California with Sun Microsystems to discuss adoption of a Java-based system.[46] The Java effort is hitting full stride, with DVB and Sun in serious negotiations. DVB as well as its American counterpart, Advanced Television Systems Committee (ATSC), have expressed their concerns over Java-licensing issues with increasing emphasis.[47] It is not unlikely that within the foreseeable future, DVB will establish standards to enable presentation layer interoperability.

The progress of this API situation should be monitored. It is not sufficient that a standard be reached. For an API standard to be viable in Europe it must be clear that it will not subject the implicated industries to onerous royalties and that it will strike the difficult balance between technical robustness and modest memory requirements. It is not entirely certain that such an appropriate standard is guaranteed to result from the work of the industry groups and software entities. Given the vital importance of the API for the functioning of parental choice systems (let alone the fundamental importance of API interoperability for European digital television as a whole), it is incumbent upon the Commission to very closely follow the progress of this standardisation effort. The viability of digital parental choice systems hinges upon true API interoperability.

Syntax

With the creation of a common API at European level or in accord with a global standard, the digital environment may allow for the standardisation of programming information syntax. The syntax standardisation would, in a way not dissimilar from PICS in the Internet context,[48] provide a technical platform for the provision of information about content that far exceeds the explanatory power of simple labels or icons. While such icons are important and useful in certain respects (as outlined and espoused below), they are ultimately limited, particularly in a multi-cultural European

---

[46] Junko Yoshida, "Microsoft, Sun duel hits new turf -- In WinCE end run, Europe seeks new Java subset for digital TVs, set-top boxes," *Electronic Engineering Times,* 23 November 1998.
[47] Junko Yoshida, "Consumer crowd cozies up to Java," *Electronic Engineering Times,* 18 January, 1999.
[48] Paul Resnick, *PICS: "*Internet Access Controls Without Censorship," *Communications of the ACM*, vol. 39 (10), (1996): 87-93.

context. Thus, the standardisation of an API in conjunction with the creation of a programming information syntax would enable both the optimal level of content information that may be provided in an electronic programme guide and the formation of a generative environment for multiple, independent labelling and information providers.

Common descriptive criteria

To allow for seamlessness both in the long *co-existence between* analogue and digital as well as in the encroaching *transition from* analogue to digital, shared labelling and information vocabularies at European level should be encouraged in order to provide a common descriptive criteria. As in the digital environment where a standard API will enable a technical platform for a syntax for receivers to receive labels and information, the analogue signals will also require standardisation (most likely the NexTView standard) to ensure interoperability. To the extent possible within these two platforms, a shared "labelling and information vocabulary" should be facilitated at European level. Such a vocabulary existing within the parallel digital and analogue environments will obviate potential rating and description discontinuities created by differences in the delivery mode (i.e. analogue or digital) of the programming. As these delivery differences should not have implications for the content, they should, as much as technically possible, also not implicate the nature of their associated labelling and information. Thus, a shared vocabulary is necessary. To advocate for this harmonisation is not, however, to assert that the vocabulary of this singular digital language should not include multiple *dialects*. In other words, the over-arching vocabulary for content labels and information should affect the difficult equipoise between accommodating the range of cultural and linguistic diversity within Europe and sustaining a shared language, as it were, at European level.

6. Technical devices, ratings and watersheds

One oft-expressed goal for improved rating and labelling systems is to effect the obsolescence of watersheds and other forms of broadcaster responsibility, as described in Chapter 2. There could be a time when parental choice technical devices have high penetration in television receivers and the social context is such that these devices are

responsibly used by parents and adequately observed by minors. However, it is unlikely, given current imperfections in the capacity of analogue-specific technical devices, that this level of use will take place during the foreseeable future of the digital transition.

Broadcasters across Europe, as a rule, take their responsibility toward programming content very seriously. Awareness among broadcasters of the expectations of their viewership is keen. Dire consequences are anticipated for betraying this confidence.[49] Use of watersheds are embraced by broadcasters as the most efficient, effective means to providing content that may be inappropriate for children in a manner that permits parents to share responsibility with broadcasters and broadcast such content at a time when children are least likely to be viewing television.[50] These arguments that support watershed requirements today are very likely to be just as convincing tomorrow. Governments may wish to measure the actuality of parental exercise of responsibility as a barometer for the suspension of watersheds. They may wish to discontinue watershed requirements at a time when parental choice can be more easily facilitated (through greater notice of programme content and the existence of technical devices) than is true now. But neither condition is likely to occur.

In a somewhat distant future, digital television may gravitate toward a more demand-driven delivery architecture. Rather than broadcasters (or, for that matter, narrowcasters), providing set programming timetables, programming menus may allow viewers to simply select from a menu and then receive the chosen programme. While this kind of delivery is available, in some instances, within pay-per-view services, this orientation may ascend from the margins to become the mainstream due, in large part,

---

[49] Both public service providers (e.g. RAI in Italy, TV2 in Denmark, Bayerischer Rundfunk in Germany) and private broadcasters (e.g. Canal+ and TF1 in France) strongly expressed these sentiments in surveys conducted during this Study. Broadcasters have an interest in overstating their commitment to this public confidence as well as the close relationship between broadcasters and audiences; they rightly fear burdensome regulation and being saddled with new technical and rating requirements. While these sentiments are likely overstated, it is hard to argue that they are fundamentally inaccurate. These responsibilities and relationships are long-held and enforced by negative audience responses as well as State governmental intervention.

[50] The above-stated sense of broadcaster responsibility is indicated most strongly by the critical role of watersheds among nearly all Member States. At bottom, national regulatory muscle undergirds watershed functions. On the surface, the long-standing social reliance on watersheds evinces the sense of shared responsibility between parents and broadcasters so frequently mentioned in the survey responses of broadcasters. Generally, broadcasters viewed watersheds as the most effective means to effecting the desired protection of children.

to the technical capacity inherent in digital. Such a shift in the way in which programming is made available would require a corresponding total evaluation of how the protections normally achieved through watersheds can be attained in a radically different context. Beyond identifying this possibility, it is past the scope of the present Study to address the implications of this prospective shift.

Returning to the foreseeable future, it is more likely that self-regulation will become a more varied, more inclusive process and will include third party interventions. Already, institutions like Internet Watch Foundation[51] have sprung up in the multi-jurisdiction environment of the Internet to provide labelling or rating structures that can facilitate the use of EPG or digital filtering and screening mechanisms. Even industry-led self regulation of the future is likely to involve establishing or supporting third-party entities or allowing access to programme information by preferred and approved third party entities.

6.1 Convergence and the new digital environment

It is important to invoke "convergence" when addressing the potential for parental choice signalling systems in this new digital information environment. This convergence is a meshing of television rating and labelling systems with mechanisms being developed for the Internet. Already, there is stand-alone filtering software commercially available that provides parents options of choosing what kinds of material to block.[52] These are often imperfect, at least at the present stage of

[51] Internet Watch Foundation. WWW page: < http://www.internetwatch.co.uk/> (version current at 16 Sep 1998.)
[52] For a representation of the array of software options, see Stenhammer Net. WWW page: http://www.stenhammar.net/kidsafe/filter.html (version current at 12 Aug 1998).

development, and are both under-inclusive and over-inclusive in terms of their various filtering capabilities. Some computer retailers bundle stand-alone filtering software loaded onto the computer's hard drive. Much criticism has been directed at these stand-alone filters, but the point is that the methodology there can be adjusted for television in a new parental choice environment.

Finally, there will be a convergence between television rating and labelling systems and the Web-based PICS filtering for third-party rating mechanisms. Ideally, any organisation can create third-party labels, self-label their own content and use other labels to filter or organise Web access. To date, the use of filtering devices by third party groups has not been rapid and the concept is still in the process, itself, of permeating civil society. It is likely, however, that the involvement by these organisations will increase. The issue is whether a world in which such third parties play the dominant role in rating, labelling and filtering should be encouraged as compared to centralised rating and labelling by the State or reliance on self-rating and labelling by producers and broadcasters.

As illuminated in this study's discussion of rating systems (Chapter 2), the carry-over of the limitations in existing approaches to rating and information provision would be the retention of an unnecessary and undesirable vestige of prior administrative and technological limitations. The two greatest values of digital technology writ large are that interoperability readily may be established and that digital has tremendous storage and transmission capacity. These two features must not be merely acknowledged in policy making for the digital era, rather they must *inform* policy. Thus, not only are the present issues concerning exposure or protection of children from harmful content fundamentally different from those in previous periods and in other media, they are not constrained in the ways which limited policy in the past. The macro-level orientation to parental choice must be crafted to ensure that the regulatory milieu facilitates the optimal uses of technologies, recognises the qualities of television media particular to the digital area, and addresses the salient points of policy forged by this technological area. Thus, for reasons amplified in the section immediately below, a positive approach to media technology is imperative. A positive approach is grounded in the pragmatics of the digital content onslaught. It is designed to foster a market for

programming related information rather than to obtain this information through coercion and dis-incentives.

7. The costs of a negative approach and the benefits of a positive approach to child protection

As indicated above, the technical limitations within the analogue setting pre-empt a cost/benefit analysis of the available devices and their corresponding system. While the study recommends broader availability of EPGs and a corresponding expansion in the arena of rating and information provision, it is clear that compulsory technical systems within the analogue setting is not a sensible policy option. Within digital, the study has identified the powerful standardisation movement afoot under the auspices of DVB and DAVIC. The resulting protocols should be anticipated to provide the sufficient technical platform for the best-case rating and programming related information environment at European level. In essence, the parental choice delivery system is a "free-rider". The technical standardisation creates the enabling environment for the necessary systems at European level. This standardisation is moving forward without any aid from parental choice efforts in any form. Thus, the technical costs of a digital technical regime, on this level, is non-existent.

Although the cost of the *technical* system in and of itself may be properly seen as a collective consumption good**,** cost *does* become an issue for consumers and manufacturers. While the signalling standardisation is the important technical determination, manufacturers will design signal receiver elements to this standard at varying costs. While it is correctly anticipated that the cost passed to the consumer should range from nominal to negligible, it may nonetheless be a small consideration. The cost of developing devices is partially offset by the establishment of standards.

Rather than individual manufacturers bearing their own research and development costs for each technical system and device element, these costs are essentially shared and distributed throughout the entire industry. Furthermore, the costs appertaining to parental choice systems are not separable from the general costs of manufacturing the related technical systems and devices. For instance, the standardisation of an

application programming interface (API) is a necessity not merely for a universally accessible EPG interface, but is imperative for the establishment of a multimedia home platform. DVB endeavours to create such a platform for the general goal of optimising interoperability of media content vis-à-vis receivers. In other words, the industry seeks such a platform aside from prospective concerns of providing parental choice mechanisms. As indicated in the above discussion, interoperability protocols provide a *minimum* technical requirement. Thus, different manufacturers and software designers will tailor or build upon these standards. The preceding establishment of standards may then be seen to have enabled the further investment of manufacturers and designers to build upon this industry-wide foundation.

At present and for the foreseeable future, parental choice delivery systems on this level are "free-riders" within the digital context. This is not to say, however, that cost does not play a tremendous role in shaping appropriate European policy.

7.1 The cost of providing programming related information in the digital era

The imposition of providing ratings, indeed, detailed ratings, from the standpoints of both producers and broadcasters would prove quite substantial in the approaching digital era. Further, requiring adequately sophisticated ratings and textual descriptions of content at a programme level, let alone at a scene-by-scene level as has been suggested by many,[53] will prove to be quite costly. The orientation to ratings that logically follows from the strategy of blocking harmful content would require a tremendous degree of oversight in order to achieve its aims. The ascription of ratings, in a monopoly ratings context, would prove to be a cumbersome and costly undertaking and would likely receive systemic resistance and evasion from producers and broadcasters alike.

It is well known that digital transmission provides the promise of 500 channels. Whether and from where producers provide the content for these channels is an open question. Residually, the prospect of mandating sufficiently sophisticated ratings, indeed rating and evaluation that would be of use to viewers and parents, for this

[53] The discussion of the implications of such policies for artist's rights is taken up in the following chapter.

volume of content is a near impossibility. Its social cost in terms of administrative machinery and escalation of cost to producers and broadcasters would be very dear.

In contradistinction to this negative approach to harmful content, the prospects of cultivating an affirmative, selective television environment for children presents strong structural inducements to the producers and broadcasters to both provide detailed and sophisticated information about ratings and, simultaneously, greater access to their content for third-party rating and information providers. In this positive environment, programming would be white-listed or selected by households as within the range of programming to be available to their children. This approach to children television viewing would signal a dramatic and desirable departure from the "channel-hopping" mode that currently predominates. Rather than moving from channel to channel as a form of television consumption in itself, the sensibility of intentional television watching may become the way in which children approach television. It is hard to advocate that "channel-hopping" provides any benefit to children's consumption of and exposure to television, especially in light of the sheer amount of time spent daily viewing television (see Figure 8). Instead, children's viewing habits, whether determined by their caretakers or parents, or self-directed by the child, should be specific in purpose and temporally delimited.

Figure 8: Children's viewing indicators - Average number of minutes per day spent by children with TV, Video and TV linked games machines, by age group**

Country	Television			Video			Games Console		
	9-10	12-13	15-16	9-10	12-13	15-16	9-10	12-13	15-16
Belgium*	95	105	115	14	21	20	11	19	14
Denmark	143	158	168	51	48	49	55	49	35
Finland	117	156	155	47	40	27	27	22	27
France	74	91	103	-	-	-	-	-	-
Germany	88	105	115	18	18	20	-	-	-
Italy	-	-	-	-	52	50	-	38	28
Netherlands	111	134	134	80	94	111	43	50	56
Spain	129	134	143	37	31	26	49	34	19
Sweden	114	140	145	40	45	46	38	26	26
UK	142	164	171	43	39	36	30	32	36
Average of above EU countries	102	120	126	35	41	41	27	28	25

Thus, as in the on-line environment, the information about and evaluation of television content would attain a high-value. Just as browsers are the gateway through which Internet users access on-line content, EPGs and related programming menus from a multiplicity of rating providers would provide the means by which parents would affirmatively attain programming for their children to view. Consequently, programming information and evaluation would be sought and selected based on the credibility of the information provider. For instance, a Catholic family in Ireland who is not so concerned about the programming broadcast from Ireland, but is concerned about some content coming from outside of Ireland, could refer to a programming menu put forward by the Archdiocese. Whether this menu is ultimately palatable or credible in the eyes of the individual family is a function of whether what appears on the television comports with that family's conception of what is desirable and appropriate. To continue the browser analogy, those who use the Internet select their browsers based on the quality, breadth and reliability of the array of web pages that are retrieved. Similarly, it should be expected that people would select programming menus based on similar criteria.

All of this is not to say that blocking information and capacity should not be available if this negative approach to protecting children from harmful content is desired.

Technically, the platform for providing information to facilitate positive strategies to programme selection would just as readily support the blocking strategy. However, as a matter of public policy, the most effective way to provide base-line protection to children is through selecting the universe of images and sounds to which they may be exposed. The blocking strategy is most appealing in the regard that it is a single decision that can function indefinitely: a rating level is selected, all programmes at or above this level are subsequently blocked. Intentional television, television that employs an affirmative strategy to protecting children, is more labour intensive. However, the fact that time may be spent on selecting channels, programmes and time-frames has two strong positive consequences: first, this creates a demand for information and selection systems that are easy to use and expedite the process of assessing the volume of programmes; second, this approach requires parents themselves to be more deliberate about what their children may watch. The degree to which parents create white-lists will vary; parents may select a number of channels, they may select channels but only within certain windows of time, they may identify a menu of individual programmes from which their children may select, they may select a menu designated by a cultural, religious, linguistic or other group.

At a policy level, the important implications are several: the process of describing and evaluating content will be plural, diffused, competitive, and thus better suited to the culturally variegated European Union; a positive strategy is the more viable way to provide protection of children from harmful content in a manner that is not overly restrictive; children will be acculturated to viewing television as an intentional activity, rather than using channel-hopping as a diversion or recreation in itself; the pressure of information and the environment in which programming is affirmatively selected will put a positive, and needed, pressure upon producers and broadcasters to firstly, increase the access of third-parties to their content, and secondly, provide more and better positive media for children.

7.2 The access to content problem

Attaining an adequate level of sophisticated rating and description, moreover facilitating plural providers of these services, is contingent upon third parties outside of the conventional monopoly rating providers gaining access to the content? In a

negative, blocking strategy approach, compulsion is the ultimate mechanism for providing access to third parties. As stated above, the volume of the content as well as the number of content providers and channels is serious impediments to the effectuation of the necessary environment for providing adequate coverage. In contrast, a positive, selection-centred approach applies economic inducements to not only greater responsiveness and breadth of coverage from the monopoly institutions, but the incentive to make programming content accessible to third party providers. Facilitating a market for the information about content and the ascent of "brand" recognition (e.g. UNICEF, the hypothetical Basque Cultural Authority, etc.) of content information providers will create incentives to allowing the greatest number of groups access to content for evaluation purposes.

Ultimately, both the negative and positive approaches will use the same information currency. The technical platform recommended here enables the conceptual platform for the provision of descriptive information about content from a multiplicity of sources with a multiplicity of standards using a shared information vocabulary or descriptive criteria. This descriptive information may mobilise blocking techniques equally as well as it may mobilise selecting techniques. The standardisation of the transmission of this information may universalise the access to this information. The shared rating information syntax between the digital and analogue transmission modes may allow for a seamless transition to the era of digital transmission dominance. The market forces that have already shaped the EPG industry will continue to intensify in Europe, providing serious competition for providing comprehensible, easy to use interfaces with the relevant information. The technical and rating environment may enable the parent to elect whether to block or to white-list. Both options will be available. Public policy encouraging and educating parents and caretakers on the importance of creating a household culture of intentional television viewing for their children may overcome the "channel-hopping" orientation. A clear policy enabling the positive approach to the harmful content question is the best way to foster the necessary incentives to providing plural and expansive coverage of content. It is the most viable way to address the concerns predicated on the ever-increasing volume of programming and the concomitant and serious concern about the nature of this content. If the usurpation of the process by purely commercial interests can be

avoided, this approach may be the strongest engine for creating the optimal European television environment for facilitating the protection of children from harmful