Parental Control in a Converged Communications Environment
Self Regulation, Technical Devices and Meta-Information

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Parental Control in a Converged Communications Environment
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Introduction

1. Background and Objectives

The protection of minors from harmful content is a matter of strong public concern. The concern lies in the fact that children are more vulnerable to influence than adults because they lack critical faculties. Traditionally, societies relied on the public responsibility of licensed broadcasters, or, in some contexts, a public service monopoly, especially in television, to limit children's access to harmful content. Broadcasting regulation facilitated parental supervision through the establishment of guidelines governing the portrayal of harmful content, the development of a specific programme schedule or watershed policy, and the classification and consequent announcement (acoustic or visual) of programmes. At the European level, these principles are enshrined in Article 22 of the Television without Frontiers Directive, as amended in 1997.[2] These approaches, originally established for terrestrially based mass audience channels, became much more difficult to maintain as the sources of television programming multiplied and new technologies made regulation far more unmanageable. Appropriate new mechanisms and paradigms for a changing multi-channel and digital environment need to be considered.

Worldwide, in the late 1990s, there was a search for such alternatives, often for technical devices that would empower parents to make decisions more easily about television within their households. Control and responsibility for content began to be shifted from the state to the home. In Canada, the United States, and elsewhere, the device known as the v-chip was adopted as a technique of choice. The question of whether European law should adopt a similar approach was posed. To determine policy in the EU, in 1997, the European Parliament enacted Article 22b.2. of the amended Television without Frontiers Directive. They determined to carry out an investigation of the advantages and drawbacks of new measures for facilitating the control exercised by parents or guardians over the programmes that minors might watch. According to the Directive, this survey was to consider, *inter alia*, the desirability of requiring new televisions to be equipped with a technical device enabling parents or guardians to filter out certain programmes, of establishing appropriate rating systems, and of encouraging family viewing policies and other educational and awareness measures. At the same time, the study would take into account experience gained in this field in Europe and elsewhere and the views of interested parties such as broadcasters, producers, educationalists, media specialists and relevant associations.

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[1] This report reflects the views of the authors only. These views do not necessarily reflect those of the DVB or any of its Members.

[2] Directive 97/36/EC of the European Parliament and of the Council amending Council Directive 89/552/EEC on the co-ordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the pursuit of television broadcasting activities; OJ EC L202/60 of 30.7.1997.

Last year the European Commission ("EC") asked the Programme in Comparative Media Law and Policy (PCMLP) at Oxford University to conduct this study on Parental Control in Television Broadcasting. In implementing the terms of reference, PCMLP sought to differentiate between technical devices that were designed for analogue broadcasting and those that were more suitable in a digital age. It looked at approaches that required government or universal rating and labelling systems and those that appeared to allow greater diversity in ratings approaches. It examined modes that might lead to greater or less harmonisation across national boundaries. The results were adopted by the European Commission on 19 July 1999 and presented in its consequent *Communication on the Study on Parental Control of Television Broadcasting to the Council, European Parliament and Economic and Social Committee*.[3] Since then, the EC has consulted with the Digital Video Broadcasting (DVB) regulatory group on the technical and commercial feasibility of implementing concepts contained in the study, notably the operational requirements of technical devices to facilitate the control exercised by parents or guardians over the programmes that minors watch.

While considering the PCMLP report, the DVB regulatory group observed several new technological and market developments which are creating additional regulatory challenges for parental control. Take-up of the Internet and digital television services across Europe is booming and both types of services are becoming integrated within one platform and interface. Bandwidth has increased and the introduction of Asymmetric Digital Subscriber Lines (ADSL) offers real opportunities for the delivery of streaming, enhanced and interactive services. Access to the Internet via mobile phone and other devices like handheld and Palm-size PCs offers further challenges to parental control. All this has lead to increased market consolidation and the creation of a new interactive media consumption environment.

These challenges led to a demand for a follow-up Report from PCMLP that would take into account inter alia the compatibility of parental control devices across on-line and digital television platforms and the suitability of filters for interactive content.

The main objective of this Report is to assist and enable the DVB regulatory group in facing the challenges of parental control in a converging communications environment. The aim is to find a coherent approach to parental control that has comparable effect across the broadcasting and Internet domains in order to avoid contrasting regulatory approaches in technologically different methods of delivery i.e. to avoid technological distortion in a converged market.

2. Structure and Scope

This Report has five Parts. Part I. of the Report provides a conceptual background for analysis of prevalent filtering technologies. The responsibility and power to filter inappropriate content may lie with a centralised or government agency, with intermediary organisations, or with the consumer. It starts from the assumptions that as volume and international character of content increases, central and national control becomes more difficult and that as technological capacity to provide consumers with information about content increases, individual control over filtering becomes easier. This section defines the four elements that a filtering system typically requires. They are an expressive rating terminology or rating categories, a responsible rating entity, a means to transmit rating information, and implementation of a filter that recognises rating terminology. This section also demonstrates that it is possible to install filters at several points along the stream of information.

Part II. of the Report takes stock of the current models of parental control and relevant developments both in a broadcasting and an on-line environment. The first section analyses current models of parental control and relevant developments of broadcast filtering and blocking techniques. It focuses on the analogue to digital transition and the changing possibilities for child protection. It updates the issues and conclusions of the previous PCMLP study and pays specific

[3] COM/99/371 FINAL.

attention to the possibilities, practices, and limitations of Electronic Programme Guides as parental control devices.

The second section gives an overview of the options in Internet filtering. This includes an in-depth look at the following five filtering models: i. Text or Graphics Screening Models, ii. Commercially Compiled 'Greenlist' or 'Redlist' Models, iii. Top Level Domain Name Filtering, iv. User Identification and Zoning Models, and v. Multi-Party Labeling and Rating Models.

Part III. summarizes conclusions from a variety of consumer reports about consumer expectations and experiences with regard to parental control mechanism. It contains information gleaned from broad surveys, consumer forums, online questionnaires, and other research methods.

Part IV of the Report examines filtering options for a converged environment. This will be introduced by a discussion of the functional elements, rating terminology, rating entities, rating transmission methods, and implementation of filters, for metainformation. Following that, there will be a description of four proposed models for filtering in a converged environment. These models are: Multi-Party Rating System, Multi-Party Rating System using National Regulatory Rating Categories; Upstream Greenlist Internet Filtering; and Third Party Greenlists or Redlists for Converged Content. Their functional elements are defined, as well as the role of the key players, cost of implementation (capital and running), paid vs. free consumption characteristics, capability to map with existing systems, simplicity for users, flexibility and internationalisation, time scale of implementation, and any practical concerns associated with the model.

Finally, Part V summarizes the main conclusions of the previous parts.

3. Key Principles in a Converged Environment

During the report the following key principles underpinning convergence are used:

- Within a converged world, a technological or platform-neutral solution for horizontally unified regulatory treatment of content can provide greater consistency, both for content packagers and consumers.
- In a media environment which includes Internet content, both the principle of scarcity and the practicality of traditional government broadcast regulation may be diminished.
- Traditional regulatory systems in a converged environment may be maintainable only through inconsistent treatment of content. Grounds for isolating particular content as an object of regulation could include (a) technological means of delivery, (b) domestic origin of content, and (c) size of audience. All of these would raise practical, policy, and administrative difficulties.
- As volume of content increases, viewers may increasingly rely on metainformation about content, and filtering or navigating methods for sorting metainformation, both for positive selection of desired material and blocking of offensive material. Markets in metainformation may play a central role in a converged environment. Parents, governments, or content packagers, however, may prefer that access to metainformation for parental control not be market-dependant.
- Availability of rating and filtering systems may make self-regulation for parental control purposes an increasingly viable option in the converged media environment.

4. Executive Outline

Within a converged communications world, it is no longer possible to regulate content solely or principally on the basis of technological means of delivery; nor is it efficient to do so on the basis of domestic origin of content. New approaches are both necessary and available. A well-designed technological or platform-neutral solution for horizontally unified regulatory treatment of content facilitates self-regulation and provides a useful political solution for government officials concerned about maintenance of standards. Such a platform-neutral solution also provides the needed consistency for content packagers and consumers

Technology provides the opportunity to deploy meta-information (information that helps to describe content) including the filtering or navigating methods for sorting such information for positive selection of desired material and negative blocking of offensive material. Undoubtedly, markets in meta-information will play a central role in a converged environment. Still, total market-dependence may not be sufficient. Especially in a converged environment, a variety of factors--governments, content packagers, society itself, will wish to ensure that mechanisms for parental access to meta-information be built into the system. The result will be a greater and more insistent call for self-regulation for parental control purposes especially in the converged media environment.

A hallmark characteristic of the converged environment is this: that the responsibility and power to filter inappropriate content will be ever more widely distributed. It will flow away from a centralized or government agency, towards intermediary organisations, and, most important, to the consumer. The push downward will accentuate. The volume and international character of content will diminish the very possibility of central control, and make more imperative the turn to intermediary organisations and consumers. Simultaneously, as the technological capacity to provide consumers with information about content increases, individual control over filtering will become easier.

Given these societal requirements, the goal of this Report is to describe, within a converged environment,

- a system to transmit meta-information,
- means for users to sort content based on that meta-information
- a neutral platform neutral to serve general users

The text offers four models. Two are Multi-Party Rating System. The first is almost wholly independent of state regulation while the second relies on national regulatory categories. The third and the fourth involve systems that do not discriminate by category, but rather by the program as a whole. One system is an Upstream Greenlist Internet Filtering system and the final one is Third Party Greenlists or Redlists for Converged Content. As the Report indicates, the authors have a general preference for the first model, the self-regulatory Multi-Party Rating System, looking to the other models as of assistance during a transition.

To accomplish these goals for a converged environment a filtering system typically requires four elements:

- Expressive rating terminology
- A responsible rating entity
- A means to transmit rating information
- Implementation of a filter that recognises rating terminology

It is possible to install these filters at several points along the stream of information, but the general tendency is to so locate the filter as to empower parents.

We look at this in a broadcasting and Internet environment, and from a non-converged and converged perspective.

Broadcasting

Analogue filtering technologies for broadcasting currently available in Europe are cumbersome. They are unlikely to become fully operational in all regions within a reasonable period. They are subject to circumvention and likely to be rendered obsolete by emerging technologies. In contrast, digital technology allows for the operation of technical devices that offer a much higher level of protection, and this especially through Electronic Programme Guides (EPG).

The study concludes that EPG operators currently severely under-use the technical capacity inherent within the digital setting for parental control.

- Rating systems within an EPG environment are derived from or closely related to rating systems established for earlier forms of media (especially cinema specific ratings) and are thus not developed for empowering technical devices.
- As a consequence, there are, currently available, only limited options for customised parental control.
- Too much competition and divergence among technological and rating systems now exists, requiring leadership for a convergent era.
- Several developments, as described in this report, such as the development of Multimedia Home Platform (MHP - a common API) and the creation of NICAM (common descriptors across media) may lead to common middleware and metadata descriptors. Furthermore, these techniques may be more adaptable and usable in a converged media environment.
- During the transition from analogue to digital and even from enhanced to interactive television, traditional broadcasting content control mechanisms will remain important.

Internet

These conclusions about broadcasting are compatible with an integrated approach to the Internet. Current filtering systems which either block webpages containing particular words or rely on lists of particular forbidden and permitted URLs are typically unreliable and over- or under-inclusive in their filtering. Proposals for "kids mode browsing", systems which would allow content providers to identify child visitors and make them responsible for blocking access if the site contains child-inappropriate content are impractical under current circumstances.

As in the other modes in a convergent environment, a multi-party rating system is the most promising.

The multi-party rating system adopted by the Internet Content Rating Association (ICRA) draws on the following elements:

- A detailed and descriptive labelling language;
- Self-labelling by content providers, supplemented by third party list-based ratings;
- Embedded labels in HTML documents and separate transmission of third party ratings;
- Highly flexible implementation of filters in the user's browser.
- Some details of the multi-party rating system described in this Report are still under development. The viability of the currently available ICRA model (which uses older RSACi descriptive self-labelling) is limited by the relatively small number of labelled sites; this problem will be a challenge to the new system as well.

Conclusion

The Report, after extensive analysis of the existing software and hardware alternatives, turns to a highly self-regulatory, multi-party rating structure that will permit filtering and enhanced parental empowerment in a converged environment.

5. List of Terms

The literature of parental control lacks a standardised vocabulary. Many terms are used inconsistently in different publications and reports, and multiple terms may be employed in reference to the same idea. In this report, the following terminology will be used:

Metainformation: information about information; for example, descriptions of the contents of a file or programme. In a broadcasting environment (BE), printed television guides or EPGs might offer metainformation. In an Internet environment (IE), information between meta tags in HTML

source code might include the author's name or descriptive labels. (Sometimes called *metadata* or *descriptors.*)

Label: descriptive metainformation describing content in standardised terms readable by humans or machines, usually directly attached to the content it describes. (Compare definition of *rating.*)

Rating: any metainformation (evaluative or descriptive) describing content in standardised terms readable by humans or machines.

Direct Transmission: Delivery of metainformation attached to the content it describes.

Indirect Transmission: Delivery of metainformation done separately from the content it describes.

Content producer: The creator of content, with whom the content originates. In a Broadcasting Environment (BE), this might be a programme producer; in an Internet environment (IE), an HTML author or artist who posts an image.

Content packager: A intermediary provider of content, who selects and bundles content to offer to consumers. In a broadcasting environment (BE), this might be a network, in an Internet environment (IE), a portal provider.

End-User or User: An individual television viewer or Internet surfer.

Filter: Any device which blocks content based on characteristics of that content.

Template: A pre-configured list of filtering criteria to be used in place of individually configured filtering preferences OR a pre-configured list of filtering criteria which correlates to a rating category in another rating system. (Sometimes called a *profile.*)

Parent: Throughout this report, PCMLP uses the word "parent" as a conventionalised term to refer to any caregiver or adult responsible for the wellbeing of a child.

PICS: Platform for Internet Content Selection, the standardised machine-readable format for describing content in an HTML file. Discussions of PICS in this report are also applicable to the newer, but less widely implemented RDF (Resource Description Framework) standard.

Rating Terminology: The set of categories used in creating ratings or labels for content.

Rating Entity: The persons or organization responsible for rating content.

6. Illegal and Harmful Content

This report is limited to harmful content. A discussion of illegal, harmful or offensive content is always a complex matter[4] that is not unique to the Internet, especially, in terms of definition. Several EU documents have outlined that it is necessary to differentiate between these categories of content[5] , but a fully satisfactory definition has yet to emerge. The "Green Paper on

[4] See OECD (1997): Approaches to Content on the Internet. DSTI/ICCP (97), S. 10.
[5] See European Commission (1996): Green Paper on the protection of minors and human dignity. COM (96) 483, final.

the Protection of Minors and Human Dignity in Audio-Visual and Information Services"[6] produced broad agreement on objectives and the action to be taken within Europe. Generally, the concept of "illegal" seems a relatively simple reference to content that is contrary to law. However, legality becomes a particularly difficult issue in the international context,where what is illegal in some countries is not necessarily illegal in others. It was only recently that Japan's lower house of Parliament banned the production and sale of child pornography. Furthermore this question can be exacerbated in a discussion of civil and criminal law, where "illegal" may only refer to that which is a criminal offence, and "harmful" might indicate that content which raises civil law issues because of questions of "harm" to another party. What one considers to be harmful or appropriate depends on cultural differences and can be distinct according to different age groups. All this has to be taken into account in defining appropriate approaches to protect children against undesired material whilst ensuring freedom of expression.

[6] See also European Commission (1997): Follow-up to the Green Paper on the protection of minors and human dignity in audiovisual and information services. COM (97) 570, final. HTTP: http://europa.eu.int/comm/dg10/avpolicy/new_srv/comlv-en.html (14 July 1999).

Part I.
Parental Control Devices and New Technologies: Conceptual and Value Chain Approach

Outline:

- *The responsibility and power to filter inappropriate content is widely distributed; it lie with a centralized or government agency, with intermediary organisations, or with the consumer.*
- *As volume and international character of content increases, the very possibility of central control becomes more difficult and the turn to intermediary organisations and consumers accentuates.*
- *As technological capacity to provide consumers with information about content increases, individual control over filtering becomes easier.*
- *A filtering system typically requires four elements:*
  1. Expressive rating terminology
  2. A responsible rating entity
  3. A means to transmit rating information
  4. Implementation of a filter that recognises rating terminology
- *It is possible to install filters at several points along the stream of information, but the empowerment of the parent to filter is preferred.*

1.1. Filtering Typologies: A Continuum

There remain large differences in both technologies and regulatory expectations of content control between the broadcasting and Internet context. Nevertheless, in extremely broad terms, three basic typologies of control can be distinguished. These typologies represent a continuum. At one extreme, regulation is centralised and consumers have minimal access to metainformation about content. At the other extreme, central regulation becomes unnecessary because consumers can carry out their own filtering and content control. The shift toward the latter paradigm is dependent on new technologies: the more that content packagers can (a) provide detailed metainformation about content and (b) give consumers technical options for blocking based on this information, the more control and responsibility can shift to the consumers. A second trend reinforces the same trajectory; as volume of content increases, content packagers' ability to monitor and control distribution may decline and as the number and geographic distribution of content producers increases, the power of any central authority to control content declines.

1.1.1. Central Regulation

Central Regulation is most understandable within the historical broadcasting context, and remains the norm for broadcasting in most countries today. Under a central regulation model, a single standard determines what content may be broadcast at any given time. This mode of regulation is only possible where relatively few entities have the power to transmit material, and all of those entities are susceptible to enforcement measures by a regulating body. This mode of control is not feasible for the Internet.

1.1.2. Intermediary Rating

Intermediary Rating broadly characterises much of the digital television and Internet filtering mechanisms available today. Under intermediary rating systems, a broadcaster, commercial filtering software provider, film ratings board, or other rating entity assigns an evaluative rating to each item of content. An example of such a rating is, "suitable for persons over 16 years of age." This rating is then communicated to parents through a device such as an EPG or on-screen icon. In most technological contexts, these ratings are merely warnings and a parent who wishes to protect a child from seeing certain material must rely on traditional parenting means to forbid access. With most Internet filtering software and some digital television systems, however, a parent may technologically block material based on its rating.

1.1.3. Consumer Filtering

Consumer Filtering is a relatively new model for child protection. Consumer filtering depends on two elements: descriptive labels for broadcast or Internet content and consumer-controlled technologies for label-based filtering. Like the Intermediary Rating typology, Consumer Filtering forces a parent to rely on another party's assessment of content. Unlike Intermediary Rating, however, the non-evaluative, descriptive labels for content leave value judgements to parents. In comparison to the first two models, consumer filtering systems are relatively adaptable to use by culturally diverse families in both a European and international context.

1.1.4. Summary

	Central Regulation	**Intermediary Rating**	**Consumer Filtering**
	Centralized <——————————> Decentralized		
Who Rates	National Government and Content Packagers.	Government, Content Packagers, or Third Parties.	Content Providers or Third Parties.
Type of Rating	Evaluative, expressing approval / disapproval.	Evaluative, often expressing appropriateness to audience by age group.	Descriptive, summarising violent, sexual, or other objectionable content.
Who Blocks	Government.	Parents or intermediary parties such as web portal providers.	Parents.
Type of Blocking	Central denial of broadcasting license.	Human (parent switches off television) or Technological (content blocked from consumer's screen).	Technological (content blocked from consumer's screen).

1.2. Functional Elements of Filtering Systems

For a converged Internet / digital television environment, feasible models for parental control will be found at the decentralized end of the continuum. While both Intermediary Rating and Consumer Filtering typologies are possible, this Report will largely focus on Consumer Filtering as the preferable approach.

Although possible rating and filtering systems are diverse, all systems share certain necessary underpinnings. Throughout this Report, we will focus on four necessary elements of filtering systems in assessing the strengths and weaknesses of the available alternatives. These will also form the basis to develop possible models of parental control in a converged environment.

1.2.1. The Rating Terminology

All rating systems depend on a standardised set of named categories for expressing information about content. In its simplest form, such a rating language might sort content into very few broad categories such as "suitable for children" and "unsuitable for children." A more sophisticated rating terminology would have more gradations in order to allow more precise descriptions of content. An important distinction should be made between *evaluative* rating languages, with categories such as "unsuitable for children under 12 years old," and *descriptive* ratings languages, with categories such as "contains nudity." Like a technological standard, the most important feature of a rating language may be its consistent use; rating terminology can be used for automated filtering only if the sender and receiver of content use the same terminology.

1.2.2. The Rating Entity

Within a rating system, one or more parties must assume responsibility for reviewing content and assigning ratings. Considerations in allocating this responsibility include (a) who has the best information about content, (b) who has the strongest incentives to rate, and (c) who will apply rating terminology most consistently.

1.2.3. The Rating Transmission Method

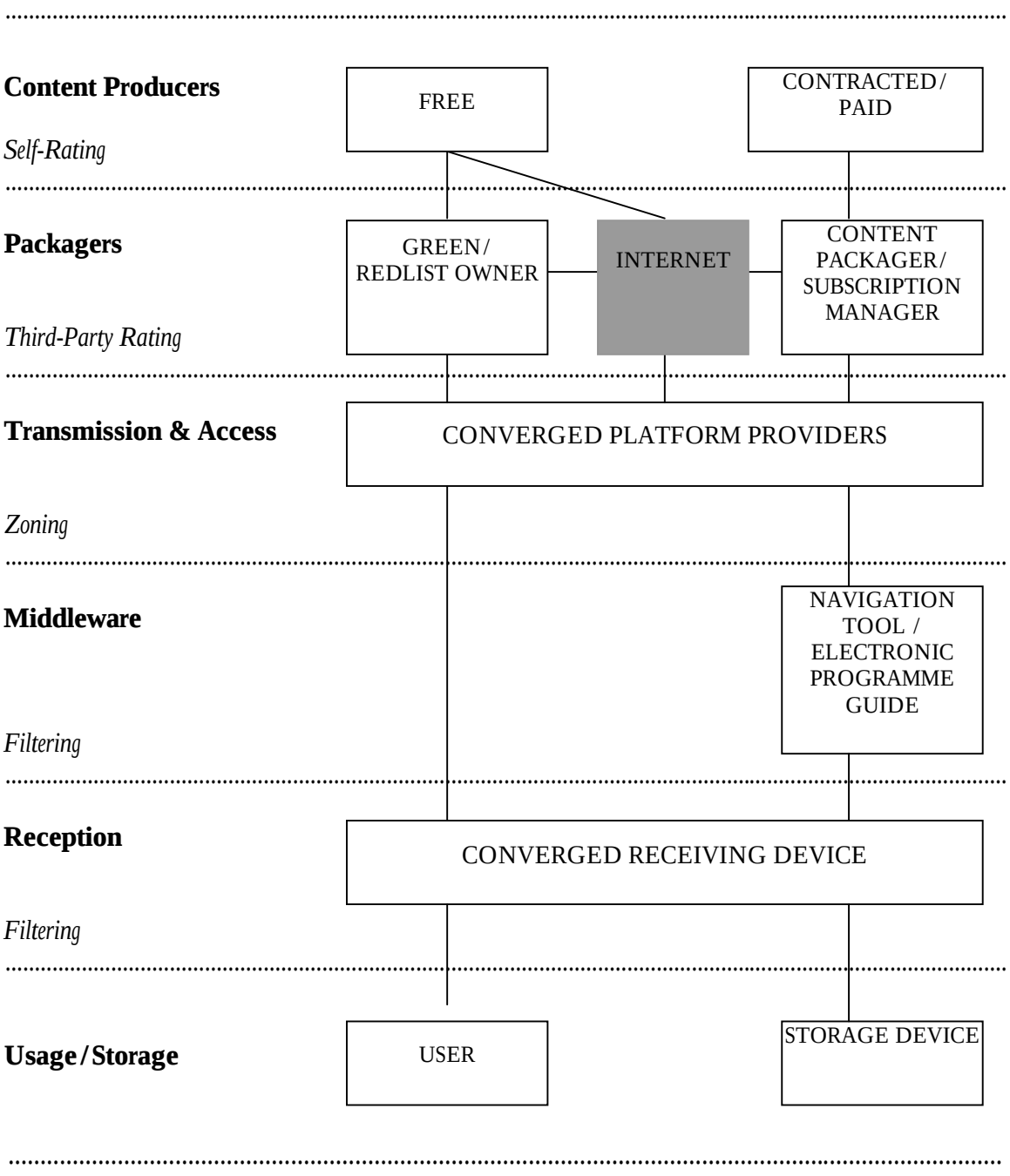
Once a rating has been assigned, it must be somehow communicated to parents. For purposes of parental control in a converged media environment, it is important that rating information be delivered in a format that facilitates automated blocking. For example, machine-readable metainformation attached to content is more useful than reviews printed in a newspaper.

1.2.4. Implementation of Filtering

Finally, filtering must be implemented somewhere along the stream of content transmission. Various entities along the content stream could apply filters; from a parental control perspective, however, user control of filters is almost always preferable. Users' filtering choices must be expressed in the same "language" as was used to rate the content if the filtering is to be automated.

1.3. Overview of Possible Filter Locations Along the Content Transmission Stream

All elements except those represented by shaded boxes may be the site of automated filtering. Content producers may contribute to the filtering system by self-rating or by compliance with contractual terms of packagers, which may require production only of content suitable for children.



Part II.
Taking Stock: Current Models of Parental Control and Relevant Developments

o Broadcast Filtering and Blocking Techniques: The Analogue to Digital Transition and Changing Possibilities for Child Protection

Outline:

- *Analogue filtering technologies available in Europe are cumbersome, unlikely to become fully operational in all regions within a reasonable period, subject to circumvention, and likely to be rendered obsolete by emerging technologies.*
- *Digital technology allows for the operation of technical devices that offer a much higher level of protection, and this especially through the Electronic Programme Guides (EPG).*
- *However, EPG operators currently severely under-use the technical capacity inherent within the digital setting for parental control*
- *Furthermore, rating systems within an EPG environment are derived from or closely related to rating systems established for earlier forms of media (especially cinema specific ratings) and are thus not developed for empowering technical devices. Hence the limited capacity for customised parental control or filtering.*
- *There is a wide divergence and competition among technological and rating systems used across Europe, yet several developments such as the development of MHP and the creation of NICAM may lead to common middleware and metadata descriptors that is more adaptable in a converged environment.*
- *During the transition however from analogue to digital and even from enhanced to interactive television, traditional broadcasting content control mechanisms will remain important.*

2.1.1. The Analogue Environment, Regulation, and Blocking Technologies

Until quite recently, all regulation of broadcast content depended on broadcaster compliance with government regulation or social norms, and did not incorporate technological controls. In many states, government regulators and broadcasters worked together to develop rules for depiction of violence, sexuality, and other themes potentially inappropriate for children. Through the device of "watershed" hours (times of day after which children were deemed less likely to see television), regulators created hierarchies of content more and less suitable for young viewers.

Broadcasters across Europe, as a rule, have taken their responsibility toward programming content very seriously, and have been keenly aware of the expectations of their audiences. They have embraced watersheds (see Appendix 1) as the most efficient, effective means of segregating content that may be inappropriate for children, while sharing responsibility with parents who can decide whether children should view television after watershed hours.

In recent years, watershed systems have in part been supplemented by crude analogue filtering technologies. Legal requirements that content providers rate programmes and that television manufacturers enable filtering have accordingly become a regulatory option for governments.

The technological device adopted in the United States and Canada, the "V-chip," enables parents to block certain programming according to ratings embedded in the broadcast. This approach has had limited success. V-chip filtering is not fully reliable, sometimes blocking innocuous material while allowing inappropriate content to reach the screen. The device itself is

also not altogether immune from tampering by clever children. Perhaps more critically from a consumer perspective, the ratings information broadcast for V-Chip filtering is minimal, consisting only of age recommendations and five very broad descriptive labels (for violence, sexual situations, coarse or crude indecent language, suggestive dialogue, and fantasy violence). The system cannot provide enough information for diverse filtering criteria and parental choice. Instead, it relies on central monolithic determinations for content that may be suitable for children.

Europe cannot adopt V-chip technology, because the VBI field which carries rating information in North American broadcasts is not available here. Some commentators have proposed development of a similar model, using the Teletext band or the Wide Screen Signal to carry ratings signals, and set-top boxes or software installed in television sets to interpret signals and carry out blocking. This model would raise various practical difficulties, such as with signal corruption, evasion of filters through tampering, or use of VCR time-shifting. Moreover, as with the VBI field used in North American filtering, Teletext can carry relatively little information, and would thus effectively negate informed parental choice. Like the V-Chip, this system would implement a simple and restricted mode of filtration.

Perhaps the most vital of the possibilities involves analogue electronic programme guide (EPG) technologies (see below) and the adaptation, NexTView, an open standard developed by nineteen multi-national television manufacturers within Europe. NexTView is a system designed to give information about specific programmes and schedules, offer means of ordering the recording of programmes in advance, and provides a means of facilitating or pre-ordering shifts from one channel to another.[7] This would provide for the organization of television use in an increasingly complex multi-channel world.

This system is adaptable to parental choice because information about the programmes is constantly provided to aid programme choice. Already, in the minimum service, information such as age suitability ratings is often embedded. Through the use of a decoder, information like this could trigger a parentally programmed block. NexTView presents promising technical features and manufacturers have reached a virtual consensus on its usefulness as a standard for analogue electronic programme guides. However, its analogue transmission mode shares the corruptibility and reliability concerns that burden other analogue modes, other Teletext-based models, and video-band based technologies as discussed above.

For all these reasons broadcasting regulation based upon time (watershed), place (broadcaster's responsibility) and manner (portrayal of content regulation) will remain important for an analogue environment. However, regulatory approaches in Europe should also focus on the opportunities and challenges of the digital environment. As described below, digital technology allows for the operation of technical devices that offer a much higher level of protection.

2.1.2. Digital Television

2.1.2.1 Digital TV and Parental Control

Digital television is significantly reshaping the ways in which families watch television and the ways they control what programming reaches their screen. The changes wrought by digital television may render some traditional modes of regulation obsolete and ineffective. At the same time, however, digital technologies make possible far greater parental control through diverse and flexible filtering systems.

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

Recent statistics on uptake of digital television service suggest ongoing shifts in the demographics of use.[8] Significantly, the makeup of the digital subscriber population is changing as the number of viewers increases. While the earliest adopters were typically men under the age of 34, uptake has recently increased among families – the consumers most interested in blocking and filtering technology.

One feature being introduced by some digital television services is time-shifting (including on-demand) programmes. If this service becomes widespread, the regulatory device of watershed hours will no longer be applicable. Similarly, the sheer volume of material available to digital subscribers may defeat careful monitoring by broadcasters. In a multi-channel environment, traditional listings such as print publications and teletext services are all under pressure to include the schedule details of an ever-increasing number of services, with the result that individual programme information is squeezed out. The main exception to this is feature films. Owing to the popularity of viewing films on television, many information providers offer discrete sections covering the day or week's films. Scope exists to indicate potentially unacceptable material. The same opportunity does not exist for other fictional or factual programming, some of which may also pose problems of acceptability for the general audience.[9]

However, digital television has two structural advantages over analogue that may more than compensate for these changes. First, digital broadcasts can carry much more information than their analogue equivalents. Ratings information for parents in a digital context can thus carry sufficient detail to be of use to culturally and ideologically diverse families. Filtering decisions can be decentralized and diversified; the shortcomings of V-Chip or Teletext blocking can be overcome. Second, digital connections may allow two-way information "pipes," allowing viewers to feed information back into the system. Viewers can input their own preferences for programme information, and select the rating or other information most relevant for their own parental decision-making.

2.1.2.2. Evolving Concepts of Digital TV

In what follows a further analysis of parental control within a digital setting will be made. It is important to underline that the concept and possibilities of digital TV are changing which may have important implications for the suggested parental control mechanism. In general, digital TV interactivity is evolving into two main forms or models: Enhanced TV and Interactive TV.[10]

Enhanced TV: The applications are fairly closely linked to the broadcast output and to the traditional perception of TV as an entertainment medium. They 'enhance' programming content rather than replace it. There is some access to new media such as the Internet and new services like home shopping and banking but usually this is provided in a way that is associated with an existing broadcast. The viewer is not encouraged to depart from the broadcast content for too long.

Interactive TV: The applications depart more radically from the established TV model and have the potential to turn the TV into a more comprehensive communications device with more extensive commercial applications. The TV becomes more like the PC, with PC-like functions, such as unrestricted web browsing, that are not closely linked to existing broadcasts.

Both models draw upon the technology of local interactivity (selection of content already embedded in the broadcast data stream) which has been in use for applications such as teletext for many years.

The 'enhanced TV' camp tends to see digital TV as more of a natural progression from the established analogue TV experience. The usage model that is anticipated is more likely to involve the following characteristics:

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[8] DART survey, January 2000.

[9] *Violence and the Viewer: Report of the Joint Working Party on Violence on Television.* London: BBC, BSC and ITC, 1998: 24.

[10] Interactive Applications for Digital TV. Implementation, delivery methods and emerging opportunities. The Phillips Group, 1999.

- an emphasis on broadcast content,
- a more passive audience,
- a strong emphasis on high quality video content and production values,
- an emphasis on TV as 'entertainment,'
- lower levels of informational/data content,
- less audience interaction,
- a one-to-many or social experience, and
- linear usage for extended periods.

In such an environment, it is likely that the more traditional notions of content control (as described above) will remain important, in addition to the newer possibilities that technical devices may offer.

The 'interactive' camp on the other hand anticipates a somewhat different usage model involving some of the following characteristics:

- greater emphasis on selection from a wide range of sources,
- a more active audience,
- traditional production values may be less central to the TV experience,
- TV includes features which may be related to work or business as well as entertainment,
- high levels of data/informational content,
- more audience interaction,
- possibility for a one-to-one experience, and
- possibility for a short-term, non-linear experience.

Here, the suggested methods of content filtering as developed within a PC/Internet environment might be more suitable.

However, there are signs that the two views of interactive TV are increasingly overlapping as a result of real-world commercial issues and many of the first digital TV applications draw upon both outlooks. If anything, the fully interactive camp has probably been the one to lose a little ground as a result of the needs of broadcasters and advertisers. The distinction remains relevant in consideration of the possible models of parental control in a converged environment to be discussed at a later stage in this Report.

Web Access and Browsing

Finally, general Internet access or web-browsing is at the centre of many people's conception of digital (and interactive) TV. In general four approaches with specific implications for parental control mechanism are possible (as will be outlined in the Internet section):

- *The carousel or webcasting model*: where pre-selected Internet pages are downloaded in the spare part of the broadcast signal for selection by the user using a simple infra-red TV controller. Thus far, trials of this approach have not been entirely successful because of the difficulties in converting Internet pages to broadcast-quality output.
- *The "walled garden"*: this is a closed loop online model, with restricted Internet access and content sectioned into categories, similar to AOL. On-Digital in the UK has said it is taking a 'walled garden' approach, with no open Internet access planned as yet. Delivery will be made via digital satellite, terrestrial, cable or ADSL, using a modem plus phone line for the return path. This approach also means broadcasters should not lose their audience via leakage onto other sites. Télévision Par Satellite (TPS) in France already provides this environment for home banking, where the graphics are broadcast, but the account data is inserted via telephone.
- *The "portal TV"*: Viewers have full Web access through a portal, which would direct them to their favourite areas, via an easy to use navigational system like an Electronic Programme Guide (see below). This is the approach adopted by Web TV, and planned by UK cable.

- *High bandwidth interactive TV*: High bandwidth interactivity is sent via cable modems and ADSL, and eventually via new technologies such as fibre optic cables and Ka-band satellites. This will enable two-way services such as video telephony.

2.1.2.3. Electronic Programme Guides

Concept

With the introduction of digital broadcasting a new class of interactive applications has become possible. Besides video and audio streams, the network can now deliver arbitrary meta-data or even executable programs to be run on the Integrated Receiver/Decoder (IRD, also known as Set-Top Box or STB). One common application is the Electronic Programme Guide (EPG). An EPG tool is uniquely suited to child-protective filtering. In the UK, more than 60% of digital subscribers reported using the EPG to inform and structure their television viewing. Usage is even higher among viewers whose subscription offers larger numbers of channels and – more importantly for this Report -- among homes with children.[11] In typical use, the EPG acts as a positive navigational guide for seeking out and organising information about desired programming. The same technological capacities make the EPG well suited for finding and blocking undesired content.

EPGs are designed to search for content derived from metainformation, and then subject that content to particular treatment, as elected by the viewer. This might mean finding and recording all nature programming on a given day – or it might mean finding and blocking all pornography. The logical and technological prerequisites for both are the same. However, as we will indicate further, current EPG implementation and currently available ratings information might cause existing EPGs to fall short of both tasks.

In this respect, parental filtering technology may evolve freely alongside more profit-driven technological advances. The additional cost of child protection in EPGs would largely lie in enabling the option of ratings-based blocking and ensuring that programme ratings reflect the concerns of parents, such as violence or sexual content. Both measures have already been at least partially implemented in some countries, as the next section will clarify.

Another value of EPGs for parents may lie in the potential for positive selection. Using EPGs to learn about available children's and educational programming, parents may be able to admit only that particular content for their children's consumption. This approach would cultivate an affirmative, selective television environment for children, in strong contrast to the "channel-hopping" which characterizes much of children's television-watching at present. Moreover, different EPG settings can be created for each member of a family and each member, once identified to the system (through a PIN code), can receive personalised information. Thus, children's programming can be provided to younger members, golf or tennis provided to golf or tennis lovers, the notification of a ppv blockbuster movie event for those interested, indications of when e-mail is waiting for the recipient, a note confirming delivery of goods purchased over the system for the buyer, and a lot more, can all be delivered through the EPG gateway.

If many parents used these positive selection methods, content producers would have greater incentives to accurately label material intended for children. In addition, if third party ratings organizations became active in assessing child-appropriate content (as some have speculated they may), programmers would have additional incentives to make shows available to these groups for advance viewing.

Current Practices

[11] For survey on subscriptions with larger numbers of channels: DART survey, January 2000. For survey among homes with children: Consumers' use of Digital TV. Summary of Oftel Residential Survey, London: Oftel, 1 July 2000.

Some countries and industry players have implemented blocking models using EPGs, although some markets are ahead of others due to complex local and political factors. Furthermore, different types of EPGs may offer different levels of parental control. An analysis of the EPG market worldwide made a distinction between three types of EPGs available (with the consequent impact on parental control possibilities).[12] The types are: (i) Listings only - no interactivity in the EPG; (ii) Listings and Navigation - interactivity possible in the EPG and (iii) User Scheduling - future development in 'self-learning' EPGs. User Scheduling is the most promising application for filtering and blocking. In each of the analysed region, between 30% and 60% of EPGs deployed were Listings only. It was forecast that by the end of 2000 this will have fallen to well below 30%; by 2002, over 90% of EPGs will be at the Listings and Navigation level. Between 2002 and 2005 User Scheduling EPGs are likely to emerge at the high price end of the market but will not exceed a 10% share till after 2005. Moreover, the report emphasised that each cultural zone requires its own EPG -- a global or continental corporate EPG will not work -- an important observation for developing ratings and programme information within a multi-cultural Europe.

In general, it must be noted that the initial steps by EPG operators severely under-use the technical capacity inherent within the digital setting for parental control. This under-use, to a significant extent, is a function of the lack of rating for a digital environment (see below). In addition, the interface which parents must employ to act (or filter) upon programme information has also been seen as problematic.

In Germany, for example, the digital satellite channel DF1 (now Premiere World) used initially its set-top box ("d-box") for parental control purposes. This gateway enabled blocking of specific programmes as well as entire channels through its EPG menu. Within Germany, this "Kindersperre" has received heavy criticism as complex and difficult for parents to use.[13] While this technology was accessed through an electronic programme guide, the absence of a specific menu for the "protection of minors" mode led parents to describe the use of the device as "uncomfortable" and "impracticable." Since then, Premiere World has further developed their parental control policy and has changed it substantially. At the moment, Premiere World adds a respective reference in the event information table (EIT) of the DVB-SI (see below) to each event (which is rated by the film classification board FSK or the broadcaster itself) for children aged under 16 or children under 18. The parental control descriptor (PCD) is entered in the EIT according to DVB-Guidelines. Due to this reference within the EIT, the d-box blocks the output of video and audio signals. After analysing the EIT and with a given PCD, the subscriber is asked to enter the youth protection PIN-code. By entering this PIN, the subscriber declares that they are informed about the relevance of the content to minors and accepts to view it. The video and audio output will then be unscrambled.[14]

In addition, the main menu of the EPG of most platforms such at Via Digital and Canal Satellite Digital (CSD) in Spain or the Mosaique EPG of Canal Satellite and the Guide des

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[12] Electronic Programme Guides. The gateway to on-demand television. The Phillips Group, 1997.

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

[14] The d-box technical network also contains a feature which allows a parental control system for broadcasting according to different age classifications. This system is currently deactivated due to a political "agreement" between regulatory authorities and content providers. The main reason for deactivation, from the regulators standpoint, was that the system should be activated by subscribers/parents themselves. Regulators felt this is not enough to have an effective youth protection. If all the parties agree to introduce the system, the overair download of a special application would be feasible. Information submitted by Dr. Anja Bundschuh, Kirchgruppe, 23 August 2000.

Programmes of TPS in France allows parents to lock entire channels based upon the available metadata or programme information.

Sky Digital's EPG demonstrates the way in which EPGs can function as parental choice devices. The EPG provides a title and synopsis of each movie/episode, British Board of Film Classification (BBFC) movie certificates, and "Reason Code" fields with high levels of Sex, Violence, Language or Mature Themes. An S,V, L and/or M can be indicated in the Reason Code field on a voluntary basis. The SkyGuide also has its own parental choice device, allowing parents to require that a PIN be entered for particular programmes or channels to be viewed. In addition, it allows parents to set a threshold price for pay-per-view events so that if an event exceeds that threshold, a PIN number is required to purchase the event.[15]

The further deployment of the EPG as a parental control mechanism will largely depend upon the evolving technology underpinning EPGs and the availability of converged ratings and programme information. These two variables are discussed further below.

Technology Underlying EPGs and the Ongoing Standards Struggle

In general, two approaches are currently used. First, a purely data driven EPG is based on the transmission of standardized data and allows the set-top box manufacturer to implement his own specific look and feel. This approach is supported by the DVB Service Information (SI) standard.[16] DVB-SI standard intimates the programming information possibilities available within the digital setting.[17] DVB-SI standard acts as a "header" for Moving Pictures Expert Group-2 (MPEG-2) information, establishing the point of contact with any type of digital receiver and indicating the technical nature of the attached MPEG-2 container.[18] This "header" function, by its purpose of identifying programmes, is a primary step towards mobilising any blocking or selecting technology.

DVB-SI standard is embedded in the transport stream as additional transport packets with unique metadata such as Programme IDs and technical information for IRDs. DVB-SI also contains Electronic Program Guide (EPG) information, such as the nature of a program, the timing, the channel on which it can be located, and the countries in which it is available. Programmes can also be rated so that parental judgement can be exercised. Hence, the DVB Service Information protocol provides the beginnings of a platform for programming related information linked with parental control in the European digital TV environment.[19]

DVB-SI can include the following options:

- *Service Description Table (SDT).* Each service in a DVB transport stream can have a service descriptor and these descriptors are assembled into the Service Description Table. A service

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

[16] Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB Systems; European Telecommunications Standard Institute (ETSI) 1998.

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

[18] The Moving Picture Experts Group (MPEG) is a working group of ISO/IEC in charge of the development of standards for coded representation of digital audio and video. Established in 1988, the group that produced MPEG-1, the standard on which such products as Video CD and MP3 are based, MPEG-2 the standard on which such products as Digital Television set top boxes and DVD are based and MPEG-4, the standard for multimedia on the web. The current thrust is MPEG-7 "Multimedia Content Description Interface". Work on the new standard MPEG-21 "Multimedia Framework" has started in June 2000.

[19] 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.

may be television, radio, or teletext. The service descriptor includes the name of the service provider.

- *Event Information Table (EIT).* EIT is an optional table for DVB which contains program names, start times, durations, other programme information as well as parental control information.
- *Bouquet Association Table (BAT).* The BAT is an optional table for DVB that provides details of bouquets, which are collections of services marketed as a single product. In principle, these could also be used from a zoning (e.g. adult only or kids friendly) purpose.
- *Time and Date Table (TDT).* The TDT is an option that embeds a time and date stamp in the transport stream and could in principle be used for watershed related blocking purposes.

The DVB-SI standard platform is necessary for ensuring universal access of programme related information, regardless of the source of the information or the transmission location of the corresponding programming. The SI architecture may provide the capacity for the desired level of programme information for the multi-cultural European context.

A second –more advanced- strategy relies on a common application programme interface (API) (in addition to the DBV-SI) provided inside the set-top box which allows the broadcaster to provide the EPG as an executable program downloaded into the box. API is a more contested area of interoperability. In digital television, the API is essentially an application execution engine. 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. At present, European competitors remain divided between use of the incompatible OpenTV, BetaNova-API and MediaHighway APIs.[20]

In addition to the API struggle, there is a vigorous debate between the 'enhanced TV' and 'interactive TV' camps over the type of set-top technology that should be adopted for digital TV. The 'enhanced TV' camp generally considers that the set-top platform, combining hardware and software, should be a relatively 'slim' and inexpensive device with simple but robust functionality that supports the enhanced model of viewing. In IT terms this idea can be linked to the concept of 'network-centric' computing or the 'thin client' paradigm. The high levels of reliability and rapid access times previously provided by analogue systems are critical to this group.

The 'interactive' group sees the set-top box evolving into something more like a PC with greater power, memory, and software complexity so that it can support a range of PC-like functions, combined with digital TV. A central application for this model is Internet access (see above). If consumers come to expect full Internet browsing capability from their digital TV system rather than restricted access linked to TV shows (the so-called 'walled garden' approach), a more powerful PC-like device will probably be necessary. In such an environment, the use of Internet filters as described further also becomes feasible within a 'TV environment.'

This issue is linked to that of content format standards because extensive use of Internet content for broadcasting purposes in the Internet's HTML language will require more power processing power at the set-top. Moreover, with the creation of a common API at European level (see DVB MHP) or in accordance 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 (see below) in the Internet context, provide a technical platform for the provision of information about content that far exceeds the explanatory power of simple labels or icons.[21] While such icons are important and useful, they are ultimately limited, particularly in a multi-cultural European context. Thus, the standardisation of an API in conjunction with the creation of a programming information syntax (or meta-information) would enable both the

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[20] IDATE report, Development of Digital Television in the European Union, June 2000. Applicable homepages: http://www.opentv.com/ and http://www.canalplus-technologies.com/media/mediahighway.html.

[21] Paul Resnick, *PICS:* "Internet Access Controls Without Censorship," *Communications of the ACM*, 39 (10), (1996): 87-93.

optimal level of content information to be provided in an electronic programme guide and the formation of a generative environment for multiple, independent labelling and information providers.

Within the context of the above the following technological developments are worthy of mention:

DVB Multimedia Home Platform (MHP)[22]

Multimedia Home Platform (MHP) is a series of measures designed to promote the harmonised transition from analogue TV to a digital interactive multimedia future. Based around a series of Java Application Programming Interfaces (APIs) for DVB set-top-boxes, MHP promises to provide a domestic platform which will facilitate convergence among the existing standards as described above.

The DVB-MHP group was created in 1996 to raise awareness of the benefits in developing a common platform for accessing a wide range of digital multimedia services. Its main responsibility today is to define user and market requirements for enhanced TV, interactive TV and the Internet (cfr. Distinctions made above with regard to these profiles). The MHP set-top boxes enable the reception and presentation of applications in a vendor, author, and broadcaster neutral framework. Applications from various service providers will be interoperable with different MHP implementations in a horizontal market. The MHP consists of a user terminal (PC, integrated TV, digital set-top box, associated peripherals, and a range of digital appliances that connect to an in-house network), a standard middleware, and a suite of APIs that are capable of supporting a range of services. The MHP-API consists of a software specification which will be implemented in set-top-boxes, integrated digital TV receivers, and multimedia PCs. In November of last year, it was agreed that the core MHP specification will incorporate Java TV technology. This agreement on defining the first profile of the common European API does not however mean that there has been any short-term shift to interoperability between Europe's principal digital TV platforms. During the next two years as MHP completes its work on finalising the other two profiles and as their owners chart a migration-path towards Java-compliance, the present dominance of the two major competing APIs - MediaHighway and OpenTV - (see above) will continue.

Multimedia Content Description Interface (MPEG) 7 and 21[23]

Multimedia Content Description Interface-7 (MPEG-7) aims to create a standard for describing the multimedia content data and supporting interpretation (and consequent filtering) of the information's meaning that can be passed onto or accessed by a device or a computer code. MPEG-7 is not aimed at any one application in particular; rather, the elements that MPEG-7 standardises shall support as broad a range of applications as possible. The main focus of the Multimedia Description Schemes (MMDS) is to standardize a set of description tools (Descriptors and Description Schemes) for generic as well as multimedia entities. This set of descriptors primarily addresses information related to the management of the content. They handle information related to the creation of the multimedia document, the ownership, the description of the media (e.g. type of compression, format) and, in general, information that cannot be automatically extracted (e.g. the composer of a piece of music) but could also be used for a description of the type of content that is transmitted and used for filtering purposes. MPEG-7 is also used within the TV-Anytime Forum (see below). Moreover, new work announced at the end of July 2000 on the

[22] http://www.dvb.org/

[23] For MPEG 7 see: ISO/IEC JTC1/SC29/WG11 Coding Of Moving Pictures And Audio, Geneva, May/June 2000, available at http://www.cselt.it/mpeg/standards/mpeg-7/mpeg-7.htm
For MPEG 20 see: ISO/IEC JTC1/SC29/WG11/N3500, Coding Of Moving Pictures And Audio, Beijing, July 2000, available at http://www.cselt.it/mpeg/

carriage of MPEG-7 metadata and descriptions in MPEG-2 Transport Streams (e.g., digital broadcasts) and Program Streams (DVD) will enable the association of metadata with audiovisual programming.[24] The specification will allow a tight link between audiovisual data and metadata. For example metadata can be associated to items in a news program by describing these items or to a sports match by indicating important events. The association could be very precise; metadata can be associated with an entire program, but also with a three seconds shot or even a single video frame.

Furthermore, in June 2000, work on a new standard, called MPEG-21 "Multimedia Framework" has started. The vision statement for the new standard is "to enable transparent and augmented use of multimedia resources across a wide range of networks and devices." Among the problems identified in the technical report outlining the multimedia framework is the following:

> One of the most important explanations to account for the progressive expansion of the Web is its ubiquity and the choice available to consumers for acquiring all content types from this domain. However, the lack of consistent content identification and description makes the search and retrieval process much harder, and consequently less satisfying, than it need be. Consumers require content identification and description to give structure to the organization of content […] Content must be categorized in different ways to enable consumers to make choices based on genre, duration, censorship, etc […] Search and filter techniques should be sufficiently sophisticated to ensure that content is both relevant and credible.[25]

The multimedia framework will be grouped into seven architectural elements. In summary the elements comprise:

1. *Digital Item Declaration:* a uniform and flexible abstraction and interoperable schema for declaring digital items.
2. *Content Representation*: how the data is represented as different media.
3. *Digital Item Identification and Description*: a framework for identification and description of any entity regardless of its nature, type or granularity.
4. *Content Management and Usage:* the provision of interfaces and protocols that enable creation, manipulation, storage, delivery and (re)use of content across the content distribution and consumption value chain.
5. *Intellectual Property Management and Protection*: the means to enable content to be persistently and reliably managed and protected across a wide range of networks and devices.
6. *Terminals and Networks*: the ability to provide interoperable and transparent access to content across networks and terminal installations.
7. *Event Reporting*: the metrics and interfaces that enable Users to understand precisely the performance of all reportable events within the framework.

The new standard will especially be significant for Intellectual Property Rights but might also prove important for parental control purposes. Further work on the Framework is expected during 2000-2001.

Uniform Resource Identifiers for Television Broadcasts[26]

As indicated, the merging of television programmes with the Internet offers many new applications and opportunities (not in the least for parental control objectives). One of these opportunities is the ability for broadcasts to carry additional information as a background stream. This represents a logical progression to a richer content from the simple teletext that has been used in some countries for many years. Another possibility involves the synchronized broadcast of Web content and television. Finally, some applications might involve clicking on hypertext links using a

[24] http://www.cselt.it/mpeg/beijing/beijing_press.htm
[25] Id, p 5
[26] http://www.w3.org/TV

remote television controller to provide for two-way interaction with Web and television content. Within the W3C, the Massachusetts Institute of Technology's World Wide Web Consortium, the interest group "Television and the Web" exists to explore new Web technology arising from this TV/Web integration. Currently, the activity focuses on coordinating the W3C work on generic Web specifications with standards groups specifically working on TV/Web integration. One suggested scheme is the creation of uniform resource identifiers for television broadcasts that may also contain meta-information about the type of broadcasts for parental control purposes.

TV- Anytime[27]

It is expected that personal video recorders (PVRs) and other 'time-shifting' devices will give consumers greater control over television content, yet the lack of standardized content referencing/APIs/metadata might limit that control. The objective of the TV-Anytime Forum is to develop open specifications for interoperable and integrated systems that will allow consumer electronics manufacturers, content creators, telcos, broadcasters and service providers to exploit high volume digital storage in consumer platforms. In particular, the TV-Anytime Forum is developing normative specifications for the following tools: Content Referencing, Metadata and Rights Management. Interestingly, in Geneva last July, TV-Anytime presented a parental control and media format description based upon MPEG-7.[28] It includes the following categories of metadata that could be transmitted under a Parental Guidance Description Scheme:

Label	*Definition*
ParentalGuidance	The parental guidance classification, using a classification scheme (e.g., MPA, ICRA, PICS) and a rating value, of the AV content.
Country	The country code using ISO 3166-1 to indicate the country for which the parental guidance description is specified.
ParentalRatingScheme	The classification scheme used in determining the rating. value (e.g., MPA, ICRA, PICS)
ParentalRatingValue	The rating value according to the rating scheme (e.g., PG-13 according to MPA).
MinimumAge	The minimum recommended age in years of the end user.

2.1.2.4 Rating and Labeling for Digital Television

General Observations

At the core of every parental control mechanism lies its rating or labelling system. That system both identifies the appropriateness of media content for children and determines the means by which children's access to that content may be controlled. Yet, despite the technological advances outlined above, little effort has been invested in developing an efficient and operative rating system appropriate for a digital era. The following observations can be made about programme information and rating for EPGs.

- Despite the increased capacity to provide descriptive information, EPG Operators are under pressure to include the schedule details of an ever-increasing number of services. The result is that individual programme information is squeezed out with the main exception of feature films.

[27] http://www.tv-anytime.org/

[28] AN130 - Media Format and Parental Guidance Descriptions and Related User Preference Elements. By P. van Beek, I. Sezan, Sharp Laboratories of America, Y. Tomioka, Sharp, K. Yoon, LG-Elite, H. H. Son. LGE, July 2000.

- Rating systems within the EPG environment are derived from or closely related to rating systems established for earlier forms of media (especially cinema specific ratings (see Appendix 2), using specific age classification (see Appendix 3) and often extended with broadcasting rating systems (see Appendix 4) and are thus not developed for empowering technical devices. This is evident in the still limited capacity for customised parental control or filtering.
- Member States have highly differentiated approaches to the process of rating and labelling, especially regarding the information released and its design.
- In general, since the EPG Operator is bound to make editorial changes to the original content, the Operator, despite not being the Rating Entity, assumes end responsibility for the final product.

Converged Approaches

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, *from* domestic to transnational and *from* television to multimedia, shared labelling and information vocabularies or meta-data across countries and across media are necessary. Within that context, two interesting initiatives should be examined further.

Netherlands Institute for the Classification of Audio-visual Media (NICAM)[29]

In 1999, an interdepartmental study group in the Netherlands suggested a substantial change in the parental control and rating regime (as enshrined in the Mediawet, Wetboek van Strafrecht and de Wet op Filmvertoningen). The most important element was the proposal to create *'...an independent institution where the age classification, and product information of all broadcasting companies, movies, videos, interactive and all other audiovisual products based on self-regulation will be coordinated and centralized.'* This has lead to the termination of the Dutch Board of Film Classification and the creation of NICAM to monitor the self-regulation of the public broadcasting system, film, video, computer games industry, and the Internet. In the meantime, the institute has developed a new classification system required for the industry. The institute intends to qualify programmes in a negative way, for example with a label like "unsuitable for young viewers" as well as award recommendations like "promotes reading skills, specially recommended for six to eight year olds." It has, however, not yet solidified plans for Internet rating, but is in negotiation with ICRA (see below) and other rating bodies to examine a common approach.[30]

Infomedia - Universal Genre Classification System (UGCS)[31]

Infomedia is a provider of TV listings for EPGs, Internet and print publications based in Luxembourg. It has developed a Universal Genre Classification System (UGCS) which allows for the consistent application of program "genres" to all types of TV broadcasts. It ensures the delivery of accurate search results necessary for users of interactive on-screen EPGs. It was created by synthesising genres used by both European TV stations and printed TV magazines from a wide range of countries. The main categories used are:

Advertising	Culture/The Arts	Factual	News and Current Affairs
Animation	Discussion	Fiction	Sports

[29] http://www.nicam.cc/
[30] Interview with Katinka Moonen, NICAM, July 2000.
[31] http://www.infomedia.lu/

Children's Entertainment Religion Textual Presentations

The system handles country-specific and language-specific program classifications by consistently applying three levels of description to the program. The main categories break down in 12 general headings, followed by sub-categories defining the type of broadcast (news, magazine, film, series). Thereafter, numerous identifiers indicate the content of the program. For instance, a Dutch publisher may want a category he describes as "Action Film," but wants that word to be translated into Dutch. The conversion table for this genre is created from his own definition of the "content" an action film covers. The resulting "conversion" table is arrived at through the following process. The overall genre is defined by the specific publisher. He wants it to consist of adventure movies, crime movies, disaster movies, thrillers and war films: If Category = "Fiction" and Type = "Film" and Content = "Adventure" or "Crime" or "Disaster" or "Thriller" or War Then Output = "actiefilm."

A similar conversion system at a pan-European level might be developed for rating and labelling of programmes transmitted through the EPG.

2.2. Internet Filtering Models

Outline:

- *Current filtering systems which either block webpages containing particular words or rely on lists of particular forbidden and permitted URLs are typically unreliable and over- or under-inclusive in their filtering.*
- *Proposals for "kids mode browsing" systems which would allow content providers to identify child visitors and make them responsible for blocking access if the site contains child-inappropriate content are impractical under current circumstances.*
- *The multi-party rating system adopted by the Internet Content Rating Association (ICRA) is the most promising option. It draws on the following elements:*
    1. *A detailed and descriptive labelling language;*
    2. *Self-labelling by content providers, supplemented by third party list-based ratings;*
    3. *Embedded labels in HTML documents and separate transmission of third party ratings;*
    4. *Highly flexible implementation of filters in the user's browser.*
- *Some details of the multi-party rating system described here are still under development. The viability of the currently available ICRA model (which uses older RSACi descriptive self-labelling) is limited by the relatively small number of labelled sites; this problem will be a challenge to the new system as well.*

This section of the Report reviews Internet filtering systems currently available for parental control. For each of the five models identified, we will include a description of the filtering mechanism, a discussion of its strengths and weaknesses, and a breakdown according to the four elements of filtering systems. Particularly detailed attention will be given to the strongest Internet filtering model, multi-party rating and filtering, as this will form the basis of some recommendations for the converged media environment.

All but one of the options depend on filtering devices located downstream of the content provider. These devices block content when they recognise something objectionable about it. Model one blocks based on particular words or images within the content itself, models two and three block based on the address from which the content originates, and model five blocks based on metainformation carried by the content as a sort of passport for filtering systems. One model, number four, operates on the reverse principle. Instead of the content "identifying" itself to the user, the user must prove *his* identity in order to gain access to certain content.

2.2.1. Text or Graphics Screening Models

Some Internet content filtering techniques rely on software, typically installed at the level of the user's computer, which screens for objectionable words or phrases in the content itself. These methods are relatively crude and unreliable, often excluding wholly unobjectionable material, such as recipes featuring chicken breasts, and accepting objectionable material which happens to use unusual language (non-English language or no language at all). NetProtect's current effort to develop text screening systems for use in multiple European languages may redress some of these weaknesses, however, the limitations of the approach remain significant.[32] Efforts to make these filters context-sensitive have been at best moderately successful; parents cannot rely on these filters to accept sites such as the ones that discuss safe sex practices while still excluding pornography.

[32] http://www.ispo.cec.be/iap/netprotect.html

These filters have also so far been ineffective in blocking visual images. At least two companies claim to have filtering software which recognizes pornographic graphics files. [33] However, these products appear to be in their technological infancy and to be extremely unreliable because they over-block innocuous images and under-block offensive ones.

Barring significant technical development, the screening method seems unlikely to be prominent in future Internet or converged media filtering. At the most, text-screening or graphics-screening could appear as one element within sophisticated, multi-layered filtering systems.

Functional Elements: Text or Graphics Screening Model

Rating Terminology:	This model relies on words within the content itself as "categories," using them as proxies for metainformation about the content. This method is highly flexible, because any word can be a rating category, but inaccurate, because the presence of particular words tells the filter little about the nature of the content.
Rating Entity:	This model has no rating entity.
Rating Transmission Method:	Since the content itself is the ratings information, ratings are delivered to the filter "directly" with content.
Implementation of Filters:	Filtering is typically implemented at the user level.

2.2.2. Commercially Compiled "Greenlist" or "Redlist" Models

- Greenlists or Redlists and Free Content

Most commercial filtering software uses greenlists that only admit specified sites or redlists that block only specified sites. These lists are the product of third party rating – the companies employ trained reviewers to assess websites and determine whether or not they should be blocked. This production of ratings by a single entity underlies both the advantages and disadvantages of the approach. To its credit, a third party rating organization can bring a relatively uniform perspective to bear on content, ensuring that its evaluations are more consistent than those of diverse content-providers. Moreover, as a single entity with contractual obligations to customers, it has both legal and financial incentives to evaluate with care and not to let inappropriate material slip through the net.

The negative side of this, however, is that a single company cannot hope to provide a comprehensive overview of the entire Internet; only a fraction of available content is likely to be viewed and rated by third parties. Thus, a significant amount of inoffensive web material is likely to be blocked to users of third party redlists, while some offensive material reaches greenlist users. Third party raters also cannot know whether the content of a particular URL will change after they visit it, and hence cannot guarantee the continued validity of their rating over time. This problem is partially addressed by regular list updates.

Another drawback to relying on a single third party to rate the entire web is that whatever unannounced or even unconscious ideological bias that entity brings to the rating process will affect the green and redlists it produces. Critics point out that existing third party raters have filtered pro-gay rights sites but not anti-gay rights sites, blocked out free speech advocacy, and otherwise subtly shaped the range of political expression available to users.[34] Users of these products typically have no way of knowing when and why sites have been blocked, since filtering criteria are typically not transparent and green or redlists are often encrypted, proprietary information.

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[33] Heartsoft Corporation recently filed for a U.S. patent for their image recognition software. www.heartsoft.com. Exotrope's BAIR system also allegedly recognises and blocks pornographic images; tests by critics of the product, however, found it highly ineffective. http://peacefire.org/censorware/BAIR/

[34] http://www.wired.com/news/politics/0,1283,36621,00.html

Although several companies currently compete to provide filtering services for parents, it is worth noting that market dynamics may eventually change this picture. Information gathering and creation of lists are costly processes; at present, many companies duplicate each others' efforts. A possible future of list-based third party rating and filtering would see those companies with the most comprehensive overview of the Internet move into market dominance – a position of great power, as they would determine what portions of the Internet are visible to many young users. Other companies might serve niche markets, providing supplemental lists more tailored to diverse parental preferences. For example, if dominant filters blocked sites with information on sex education or contraception, one supplemental list might clear the way to access these sites. Or, if dominant filters retained access to information about many religions, another set of supplemental filters might block all but sites endorsing the religion practised by parents.

- Enhanced Greenlists and Proprietary Content

A variation on the greenlist approach is the proprietary "walled garden," in which carefully screened free content is supplemented with paid access content. The proprietor of such a walled garden could commission child-safe content for the exclusive use of customers.[35] He might further ensure the safety of material within the garden by means of contracts with non-commissioned content providers, binding them not to introduce any objectionable material once their sites had been included on the greenlist. Despite lack of payment, content providers might enter such contracts out of desire to be included in popular walled gardens. Through these devices, walled gardens could offer stronger assurances of safety than normal filtering systems.

Even more so than the typical greenlist-based models, a walled garden fortified with contracts and careful monitoring might attain security only by sacrificing volume and diversity of content. This trade-off may appeal only to certain consumers: those parents most anxious about children's exposure to online material and schools or other institutional caretakers. Indeed, an ambitious early walled garden project, BT's Campusworld, was specifically developed for the educational market.

Functional Elements: Commercially Compiled "Greenlist" or "Redlist" Model

Rating Terminology:	Simple red- and greenlists have two rating terminology: blocked and not blocked. Others rate sites according to multiple categories, and let users configure their own lists based on this terminology.
Rating Entity:	The list compiler (usually a commercial entity).
Rating Transmission Method:	Ratings are indirectly transmitted as encrypted lists. Filtering software then compares the lists against URLs which users attempt to visit.
Implementation of Filters:	Filter is typically installed at the user's level.

2.2.3. Top Level Domain Names as a Basis for Filtering

With ICANN's decision to introduce new top level domains (TLDs), designation of a separate TLD (such as .sex, .xxx, or .red) for adult material became a realistic possibility.[36] It is also

[35] This might be most appealing to parents if the garden offered, for example, chat rooms monitored by accredited schoolteachers.

[36] .red as proposed during the interview with Stephen Temple, NTL, July 2000. For the TLD discussion see http://www.icann.org/

possible that a new TLD for children's material may be created. This shift may be quite helpful to parental control efforts if it causes some or all adults-only (or children-only) content to migrate into designated TLDs. Parents may be able to eliminate substantial amounts of pornography by blocking .red URLs or restrict a child to extremely safe content by admitting only .kid URLs.

This transition would not obviate the need for a more sophisticated parental control system. Considerable content of concern to parents would remain in TLDs other than .red. Violent, intolerant, or other objectionable content is unlikely to shift to a content-segregated TLD. Similarly, any provider of sexual content who did not wish to be considered a pornographer would be wise to avoid a "red light district" web address – a vast array of artistic, medical, and other sexual material would reasonably remain outside of .red. Finally, pornographers currently in possession of valuable .com domain names are unlikely to give them up so long as customers remember the current URL.[37] At the same time, it is possible that a .red site, or certain pages within one, could contain content acceptable to some parents, making across the board filtering of .red URLS inappropriate. Given these complications, additional filtering tools are still be needed.

Functional Elements: Top Level Domain Name Filtering

Rating Terminology:	Imprecise – all sites would be sorted into one of only two or three parental control categories (.red, .kid, and everything else).
Rating Entity:	First party rates itself by choosing a TLD.
Rating Transmission Method:	Direct and indirect – ratings are expressed in the URL and therefore transmit directly with the content, but the filter can also block an outbound URL request without waiting for the content, on the basis of a "redlist" barring <anything>.red sites.
Implementation of Filters:	Users' browsers could be configured to block all URLs with certain TLDs; some users might want upstream filtering.

2.2.4. User Identification and Zoning Models

Most of the options identified by this Report rely on user-end filtering of content. "Zoning" represents the opposite approach; instead of the user's machine recognizing and blocking certain content, the provider's machine recognizes and blocks certain users. This paradigm for Internet content regulation is receiving attention in the United States, in part because of legal considerations arising from the U.S. Constitution. The Congressionally established Child Online Protection Act (COPA) Commission has heard testimony and accepted written submissions supporting a zoning approach for protection of children online.[38] While these considerations may not directly affect Europe, the network effects for the rest of the world would be significant if the United States were to pursue a zoning model.

- Lessig's Zoning Model

As articulated (outside of the parental control context) by Stanford Law School professor Lawrence Lessig, the zoning model is in part driven by a desire to make upstream censorship (i.e. filtering by anyone but parents) as difficult as possible by avoiding any necessity for websites to describe their content. It draws on a logical division of the tasks involved in content filtering. In order to block content appropriately, one must know (1) what the content is (i.e. whether it is inappropriate for certain viewers) and (2) who the viewer is (i.e. how old he is, and what rules he is

[37] Forced relocation would raise freedom of expression questions unprecedented in the history of international law; customer boycotts via redlists might be effective, but would risk becoming a tool of censorship against ambiguous "sexual but not pornographic" content.

[38] http://www.copacommission.org/

subject to).[39] The first piece of information is best known to the content-provider, while the second is best known to the user himself. A censorship-disabling regulatory structure can be built on the following division of labour: parents are responsible for making children identify themselves as such online; content providers are responsible for assessing their own content and blocking access to children if necessary. The responsibility would be analogous to that of real-world sellers of pornography, who recognise children on sight, and physically prevent them from entering the store – hence the term "zoning."

In practice, Lessig suggests, this system would rely on "kid's mode browsing." In kid's mode browsing, each time the browser contacts a new site, it would also transmit a digital certificate announcing the user as a child. (For privacy reasons, the certificate would presumably not identify the user as a *particular* child.) Kid's mode browsing would be the default on a family computer and adults would use a password to turn the feature off.

Implementation of such a system would require changes in technology and behaviour by both users and content providers. At the user's end, the challenges of implementation seem surmountable. Currently available browsers are not equipped for a user identification system of this sort. However, as Lessig persuasively argues – and recent U.S. legislation allowing digital signatures for online contracts illustrates – it is in the interest of both e-commerce businesses and government regulators to encourage the development of reliable online user identification systems. The technological underpinnings for such a regime are likely to emerge whether or not they are used for child protection. While a browsing mode which always uniquely identifies an individual user might raise serious concerns about privacy, general kids' mode browsing would be far less controversial. Similarly, while a system dependent on positively identifying adults might fuel a black-market in adult identification, these problems would not arise if only young users had to self-identify.

At the content-provider's end, implementation of such a system presents more challenges. Technologically, little difficulty exists. Indeed, many adult content sites currently rely on similar systems, admitting users only if their age is verified by a credit card number or an identifying code from a service such as AdultCheck.[40] Greater difficulties arise, however, both in ensuring content-provider compliance and in implementing the system across national jurisdictions. Websites featuring material clearly and legally inappropriate for minors – such as commercial pornography – might reasonably be required to implement ID-checking systems, and held legally liable if they do not. Sites with uncertain legal status, those containing artistic or medical materials, for instance, would face greater difficulty in determining whether the system was necessary. These content providers might raise valid legal objectives to a mandatory zoning system on the basis that it violates their free expression rights. Practically speaking, as with most systems, inappropriate content might still reach children while acceptable content might be unnecessarily blocked.

The problem becomes more intractable in light of the international character of the Internet. One problem is that every nation has different standards for child-appropriate material. A responsible and co-operative content provider would face enormous research and technological hurdles in determining which national rules governed which child online and how those rules applied to his own content. Even if this complexity could be resolved, the system would still be defeated if certain jurisdictions did not enforce content-provider compliance. Unless blocked by some supplementary measure, URLs from those jurisdictions would still be accessible to children in

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[39] Lessig's early discussions of the model assumed a simple rule: all content is either permissible for children or impermissible for children. See Code and Other Laws of Cyberspace Boulder, Colorado: Basic Books (1999) 175-182. Of course, the model becomes more complicated if content is permissible for certain children but not for others, whether because the children live in different legal jurisdictions or because their parents wish to enforce different restrictions concerning legal material.

[40] AdultCheck is a free service. Users provide a credit card number as proof of age at AdultCheck's secure site, and in return get a unique adult identification code accepted by many adult content sites. This saves users from the dangers of transmitting credit card numbers to every site they visit.
Homepage: http://www.adultcheck.com/

the rest of the world. Content-providers wishing to avoid the regulation of their home jurisdiction could simply place content on unregulated foreign servers.

A final reservation about a zoning approach to child protection is that it disables parental choice. Consumer research has consistently indicated that parents prefer to make their own rules regarding children's access to Internet content. Some parents may be particularly concerned about violence, others about intolerance or strong language. As proposed, the zoning solution would not allow parents to specify which content they found objectionable, it would instead define a single category of content as inappropriate for all children. From the perspective of consumers and marketing, this consideration alone may doom the acceptability of a zoning solution.

The remainder of this report will not emphasise zoning proposals, but instead focus on a multi-layered filtering approach as described below. However, it is important to be aware of the strengths and weaknesses of a zoning approach. Given the size of the United States market, if U.S. users or government were to support a zoning model, the network effects would be significant. European regulators and technology leaders should be aware of this possibility, and of the effects it would have on the global regulatory landscape.

- A Zoning and Filtering Hybrid Model

A more speculative model might draw on the strengths of labelling systems to correct weaknesses of zoning. If multiple jurisdictions did adopt zoning requirements while retaining existing domestic child protection regulations, then the digital certificate transmitted in "kids' mode browsing" would have to assert not only that the user was a child, but that he was a child subject to a particular national set of rules. A server determining whether to block a particular user would need to know, for example, if it would be illegal to show nudity or extreme violence to that user, but legal to show kissing or use of mild profanity. In order for the content provider's server to understand distinctions between the rules governing French children and those governing Saudi children and in order for it to compare a given restriction against the content on the site, it would have to be instructed in standardised, machine readable terms describing both the provider's content and the user's restrictions.

As a practical matter, this poses the same challenges faced by filtering systems that must describe content in terms useful for diverse filter settings. Like the hybrid zoning model, these systems need an internationally standardised vocabulary for describing and classifying child-inappropriate content. The technological format for carrying this information, PICS (and its successor, RDF) is already developed. Several efforts have been made to develop standardised rating terminologies, most promisingly by the Internet Content Rating Association (ICRA).

An internationally applicable hybrid zoning model might require a kids' mode user to transmit a digital certificate expressing, in standardised terminology, the legal and parental restrictions governing his content access. The content provider's server would then compare the certificate against its own content label – which would use the same standardised terminology – and block access if the site contained content not allowed for that user. The mechanism would function like a digital lock and key, with the content provider's "lock" admitting only users with particular digital certificate "keys."

Functional Elements: User Identification and Zoning Models

Rating Terminology:	In Lessig's original model, a category might be "American under age 18." The hybrid model would require a standardised descriptive terminology.
Rating Entity:	Both the user and the content provider would have to self-rate (though the content provider's rating would be known only to himself).
Rating Transmission	The user would carry his "rating" with him as a digital certificate;

Method:	content ratings would not be publicly available.
Implementation of Filters:	Filtering would take place at the content provider's server.

2.2.5. Multi-Party Labelling and Rating Model (MPLRM)

This section will detail a multi-party rating system similar to that described by Professor Jack Balkin as a "layer cake model" (see Appendix 5). By far the most advanced current multi-layer project is the one scheduled for release by the Internet Content Rating Association (ICRA) in Fall of 2000. However, at least one other project, the World Wide Web Safe Surfing Service, is developing a system which will use several filtering technologies in layered combination.[41]

Discussion of ICRA will focus on the new system. This system incorporates substantial changes from the RSACi self-labelling and filtering system that ICRA currently administers, but will be compatible with older labels from that system. Although some elements of the new ICRA rating terminology were not finalised at the time that this report went to press, most of the details below are finalised characteristics of the system.

- Overview: MPLRM

In rough overview, the system works as follows. Content providers fill out a questionnaire with simple descriptive information about nudity, sexual activity, violence, strong language, and other potentially objectionable elements of their sites' content. ICRA converts this information into a label expressing the descriptive information in machine readable PICS format and the content provider puts the label into the source code for his webpage. Parents use the same descriptive categories to configure a filter that comes installed in their browser. They may opt to accept or reject those sites without labels. For both content providers and parents, various shortcuts including use of pre-configured templates can expedite this process. Parents may then supplement their label-based filters with greenlists or redlists provided by third parties.

As the discussion below will detail, the multi-layer model is a robust one by comparison to the other options outlined above. The system promises to deliver a carefully balanced division of rating power with an accessible and user-friendly front-end. With some 150,000 sites currently rated using RSACi and user-end filters already included in both Netscape and Internet Explorer, the system has momentum as a standard, although not enough sites are currently labelled to make label-based filtering a strong option without supplemental lists. ICRA has several significant institutional advantages, as well. It has received project funding from the European Union under the Internet Action Plan for promoting safer use of the Internet and is backed by an impressive array of both non-profit organizations and Internet and communications companies.[42] Co-ordination with these important industry participants should be quite helpful in the development and promotion of the system.

- Filtering System Elements: MPLRM

o Rating Terminology: MPLRM

[41] http://www.ispo.cec.be/

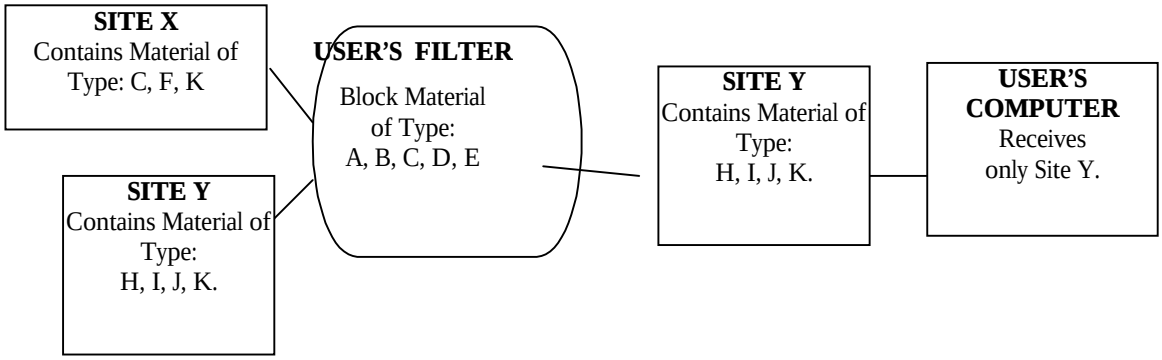
[42] ICRA's members include AOL Europe, British Telecommunications, Bertelsmann Foundation, Cable & Wireless, THUS, Deutsche Telekom Online Service, Electric Network Consortium of Japan, EuroISPA, IBM, Internet Watch Foundation, Microsoft, Software and Information Industries Association, and UUNet. http://www.icra.org/membship.htm

A multi-layer rating system can employ separate rating terminologies at each level. Supplemental third party red- and greenlists may sort URLs by whatever categories the list maker chooses, so long as in the end the user has a list of sites rated red or green. The categories used for content provider self-rating, however, are critical to the functioning of the system.

The "first" layer of the filtering system depends on two components: (1) the content-provider's description of material on his site, and (2) the user's description of material he'd prefer not to see. (Although filtering can be implemented elsewhere, this Section will assume that the end user is doing the filtering.) Filtering software compares the description of content against the user's filtering criteria, and accepts or blocks material accordingly.

For example, the user has configured a filter to block lethal violence. If user tries to view a site labelled as containing lethal violence, it will be blocked. If she tries to view a site labelled as containing non-lethal violence, it will not be blocked.

Figure 2: Use of Filter to Block Whole Site



As discussed above, in order for this system to work, a single common terminology must be available to the content-provider for labelling his site and to the user for expressing his filtering choices. Without this common language or set of categories, the system cannot automate filtering. (A filter which blocks "nudity" will not block a site with labels for "nakedness," "desnudez," or "nacktheit.") Ideally, this terminology should be precise enough to satisfy diverse filtering needs, but not so precise that rating becomes burdensome for content providers. It should convey objective, descriptive information about content as far as possible (though subjective interpretations of terms cannot be entirely avoided). Its terminology must be translatable into the languages of Member States and beyond, with parallel terms in each linguistic version of the standard. As with any standard – technical or otherwise – success of the rating terminology will depend as much on widespread adoption and network effects as on the strength of the standard itself.[43]

This discussion will focus on ICRA's rating terminology, since it was developed in the context of a multi-layer rating system. It is worth noting, however, other efforts to develop open terminological standards for use in Internet self-labelling and filtering systems. SafeSurf and RSACi produced two early, widely used terminologies. Although both aimed to develop value-neutral, descriptive terminologies for creation of labels, both have drawn some complaints of American cultural bias. More ambitious recent efforts, designed for European and international markets, include the new ICRA categories and Euforbia's proposed "annotation" system.[44]

The new ICRA rating terminology are not firmly settled as this report goes to press. It is certain, however, that there will be about fifty descriptive categories. There will be detailed categories for such subjects as violence, nudity, sex, and strong language. Simpler labels will address

[43] The *technological* standard for conveying this information is discussed in the section on Rating Transmission Methods, below.

[44] http://www.ispo.cec.be/iap/euforbia.html

intolerance, monitored and unmonitored chat rooms, and use or endorsement of tobacco, drugs, and alcohol. Other categories will address contextual factors, such as art or education, which might "redeem" otherwise objectionable material. ICRA has determined not to include categories for privacy (collection of personal information) or financial transactions, despite strong consumer interest in filtering content of this sort.[45] On initial release, only English language labelling questionnaires and filtering interfaces will be available. However, these will shortly be followed by German, Spanish, French, Japanese, and other foreign language versions.

o Rating Entity: MPLRM

The multi-layer system employs both first and third party rating, using each approach to balance and cancel out the weaknesses of the other. The advantage of first party labelling (i.e. labelling by content producers themselves) is its potential coverage: the gargantuan task of labelling the web may best be carried out by distributing the work to as many parties as possible. First party rating also efficiently draws on existing capabilities by assigning the work of labelling each site to the person who already knows it best. The disadvantage of first party labelling is the risk of false or inconsistent application of labels, or of content providers choosing not to rate.

Third party rating systems have nearly opposite characteristics: they are good at applying ratings consistently, but bad at reviewing vast amounts of content. Once the foundation of first party rating is in place, however, these attributes can be used to the advantage of the overall rating system. In the ICRA model, the work of third party raters shifts from the sisyphean task of rating the whole web to the more manageable one of correcting perceived failures or inconsistencies in first party labelling. Third parties can help parents to fine tune their filters by providing greenlists of sites which they deem acceptable despite their labels or redlists of sites which should be blocked.

Another weakness of third party rating is also converted to a strength following this model. Inevitable cultural or political biases are a drawback when third parties try to rate the entire web for a general market of ideologically diverse customers. With the more narrowly defined task of reviewing only certain content, or serving only certain parents, however, such biases can be a selling point. Parents may seek out third party lists which reflect their own ideological and cultural preferences. Topically focused third party interest groups are also particularly well-suited to address narrow issues for which "objective" self-labelling falls short. For example, an arts group might review and greenlist sites in which nudity is shown in "artistic context," or a Christian organisation might greenlist online Biblical violence. Through multi-layered rating, ICRA gives parents the power to selectively reintroduce subjectivity, cultural specificity, and ideological preferences within a system which otherwise strives for objectivity and neutrality. (Note that the same third parties have a second role, as creators of filtering templates. This will be discussed below.)

Third Party Lists: Supplements to Content Provider Self-Labelling

Subjective Interpretation:	Content providers who self-label and users who set filters may have culturally different understandings of labels, no matter how "objective" the terminology. This may be a particular problem for categories such as "intolerance," which are likely to be understood differently by the relevant content providers and concerned parents.
Mistakes:	Content providers may simply make mistakes in rating, or update the content of their sites without reconfiguring the labels.
Context:	Contextual factors, such as art or news reporting, may make otherwise inappropriate material acceptable to some parents. Although the ICRA labelling categories will include context, these issues are highly susceptible to subjective differences of opinion, making third party lists particularly useful.
Other Parental	Some parents may have concerns which are simply not addressed by the labels.

[45] http://www.incore.org/final_report.htm

Concerns:	ICRA labels will not cover privacy and data collection, for example, and may not cover tobacco use. These gaps could be made up by third party lists.
Deliberate Mislabelling:	Predatory content providers might intentionally mislabel their sites. (This issue is of particular concern to parents, however, ICRA has experienced almost no incidents of intentional mislabelling so far.)[46]
Unlabelled Local Websites:	If unsophisticated regional content providers fail to self-label, a regional greenlist put out by a church, town council, or other organization could make local interest sites accessible even to users who generally block unrated sites.

In the section on Ensuring Key Player Participation (2.2.5.3.2.), the Report will discuss some practical steps toward implementing first and third party rating.

o Rating Transmission Method: MPLRM

First-party labels are embedded in the content they describe and are thus directly transmitted to filters. This transmission is made possible by the Platform for Internet Content Selection (PICS) and Resource Description Framework (RDF) specifications, both open standards promulgated by the World Wide Web Consortium.[47] PICS establishes a standardised, machine-readable language for metainformation describing content in an HTML file. This enables machine communication of labels, but does not necessitate particular labelling categories – any description can be expressed as a PICS label. At the user end, instructions in the PICSRules language tell the filter how to react to particular PICS labels.

PICS labels are placed in HTML files, the source code for standard web pages. At present, graphics and other file formats cannot carry PICS labels. Hence, the PICS labels describing a picture reside not in the image itself but in the web page on which the picture is displayed. This is typically adequate, as the webpage may be the only way to access the graphic. However, in some situations metainformation on a single HTML page may not work well to describe other content to which the page provides access. For example, a single page may provide links to multiple downloadable or streaming media files.

Third party rating relies on a different transmission device. Greenlists or redlists can reach users via e-mail, in downloadable form from a website, or through other transmission methods. In all cases, however, the transmission is indirect – metainformation arrives separately from the content it describes. The user's computer must cross-reference the URLs on a greenlist or redlist against each address the user attempts to visit, in order to determine whether or not to block the site. Third party redlists are also likely to be encrypted, so that they cannot be abused as guided tours to the seedy side of the Internet.

o Implementation of Filters: MPLRM

Individual users implement filtering in their own machine using software installed in the browser. Both Internet Explorer and Netscape currently ship with ICRA's RSACi filtering software

[46] In addition, ICRA is developing new processes for label assignment which will make it impossible to copy and re-use another site's label.

[47] RDF is gradually supplanting the currently dominant PICS standard, but the two standards are compatible. W3C explains, PICS-1.1 is a W3C Recommendation that predates RDF. One of the requirements for the RDF design was that it be able to express everything that a PICS-1.1 label can express, and that it be possible to automatically translate PICS-1.1 labels into RDF format without loss of information. Any future technical work on PICS will evolve it to using RDF. The W3C PICS Interest Group is chartered to decide when this transition is appropriate. Software and Web content using PICS-1.1 will remain a supported W3C recommendation for as long as the market demands. Our current expectation is that PICS-1.1 and an equivalent expression of PICS ratings in RDF will both be useful for quite some time. http://www.w3.org/RDF/FAQ.html Discussion of PICS in this report is also applicable to RDF.

installed and accessible to users from menus at the top of the browser window. Parents can use checkboxes to select which descriptive labels should trigger blocking.

ICRA will provide an even simpler set-up options in the new system through the use of third party templates that automatically configure the user's filter settings. Some popular templates may be bundled with the ICRA filtering software, while others would be available for download off the Internet. Trusted organizations such as museums or youth groups might supply such templates, tailored to the preferences of a particular community. Government or media organizations could also take advantage of network effects associated with already-familiar ratings systems, such as film classifications, by designing templates to fit those classifications. Thus, one available template might set filters to the equivalent of a "Motion Picture Association of America PG-13" rating, while another might automatically configure church-sanctioned "Greek Orthodox Church Young Teenager" filters.

As a second step, users would install the supplemental redlists and greenlists discussed above. Since this portion of the ICRA model has not yet been implemented, the precise mechanism for third party list installation is uncertain. It should, however, be a relatively simple process, akin to antivirus software updates.

The filtering process is relatively transparent to users. When a site is blocked, a screen on the browser explains that it has been blocked, and offers an option for password-holders to override the filter. It may also offer a link to an explanation of the site's labels.

- Key Players: MPLRM

o Roles and Responsibilities: MPLRM

▪ Content Providers

Content Providers will fill out questionnaires concerning their content, either at the ICRA site or through their web authoring software. For content that is entirely child-safe or entirely inappropriate for children, there may be a one-click option to automatically fill in the questionnaire. Managers of sites containing many similar pages can create a single label for the index page and it will apply to all pages on the server. The completed form will be automatically processed by ICRA and a unique identifier and PICS label will be generated. The content provider then pastes this label between meta tags at the top of the page's HTML source code and the rating process is complete.

▪ Third Parties

Third Parties may perform one or two tasks. First, they may define templates for filtering settings which they find appropriate. These templates would be downloadable by parents from third party websites, and would automatically configure filtering settings in the user's browser. Second, third parties will compile greenlists or redlists of websites, to be used by parents to supplement filter settings. Both lists and periodic updates can be made available to users by download from the compiler's website, by e-mail distribution, or other means.

▪ Users

Users will find filtering software already installed in newer browsers. Parents activate the filtering system, and establish a password to bypass or reset filters. They may then design their own filters by selecting among the labelling categories or download a template with the filtering categories already selected. ICRA may also offer shortcut checkboxes to enable "maximum protection" with one click. Users can then supplement the filter by visiting third party sites and downloading green- or redlists. Since the lists will consist of relatively simple data (lists of URLs,

perhaps some supplemental information) neither download time nor memory requirements should be significant. Users may periodically update lists via small additional downloads.

- Ensuring Key Player Participation: MPLRM

At present, the greatest weakness of the ICRA system is that too few sites have labels. In consumer tests, users who tried filters expressed broad support for the labelling and filtering model, but said that they would not use the system until more Internet content bore labels.[48] Since the ICRA model relies largely on uncompensated effort by both first party content providers and third party list makers, it is important to find means to both encourage participation and make participation as easy as possible.

- First Parties

Content providers are most likely to rate their websites – and to rate them accurately – if they may otherwise be blocked from reaching users. Obviously, this raises a cyclical problem: content providers may be slow to label until users adopt filters, but filters are not useful to users until numerous sites are labelled.

Third party lists of objectionable unrated sites could play a strong transitional role, giving content providers incentives to apply labels. In addition, the sites of greatest concern to parents may be among those most likely to voluntarily adopt self-labelling. Representatives of the adult online industry have shown a strong interest in the ICRA system, and have expressed willingness to implement self-rating on a large scale if this can be done without substantial cost. Many providers of pornographic content are strongly interested in appearing respectable, co-operative, and non-threatening to children – both in order to increase their perceived legitimacy as business people and to ward off government regulation. In addition, online pornography providers have a simple financial interest in keeping children away from their sites. Child visitors typically consume system resources by browsing free material, but never become paying customers.

As ICRA has recognized in its Advisory Board Report, adoption of labelling by commercial pornographers can be hastened if technical devices make the process simple. One relevant aspect of the ICRA system is the option to provide a single label for an entire site, as opposed to separate labels for each page within a site. For sites with consistently child-inappropriate content, a single label can suffice to cover many pages. A second device, which may be developed by ICRA in co-operation with adult industry representatives, would be a shortcut button for labelling pornography. Much like the templates which allow parents to configure detailed filter settings with a single click, this would allow content providers to fill out the full questionnaire in seconds.

A final device to facilitate self-rating would be the inclusion of the ICRA labelling questionnaire in popular web authoring tools. By making the creation of labels a normal part of the content production process, this tactic can make self-labelling much easier and more attractive. Other potential means to promote self-rating might include co-operating with Internet Service Providers or Domain Name Registration organizations to inform content-providers about self-labelling and direct them to the ICRA site.

In its report to the European Commission, Internet Content Rating for Europe (INCORE) suggested that marketing techniques be adopted to promote awareness and use of self-labelling schemes. If sufficient resources are directed to this effort, it may be quite helpful in encouraging content providers to label their material.

- Third Parties

[48] INCORE Report p. 26.

The work of third party rating organizations within the ICRA scheme would consist first in monitoring web sites to discover sites for green- or redlisting, and second in the actual production and distribution of lists.

The first task, that of monitoring the net, may best be accomplished with the help of parents and other concerned persons. Individual websurfers will wander farther and wider in the Internet than organizational list-makers can hope to and may prove the best scouts for mislabelled or otherwise problematic content. The European Commission has already recognized the value of individual monitoring and reporting in its statement on "Illegal and Harmful Content on the Internet," which called for Internet Service Providers to establish user hotlines.[49] The Commission has further supported this model through funding for the INHOPE European hotline network for reporting harmful or illegal content. This move signals not only confidence in the hotline mechanism, but a promise that the technological and infrastructural preconditions for a successful user monitoring regime will be in place as filtering evolves. Information gathered through this mechanism could reasonably be passed to relevant third party list makers, who might rely on reports from subscribers to their lists in order to update their content and reflect new discoveries or changes in the web.

A significant kernel from which third party lists may grow can also be found in existing lists of approved or disapproved links maintained by various web-savvy organizations. The Simon Wiesenthal Centre, for example, maintains a thorough list of sites which promote racial hostility. This could easily become a standard redlist for parents concerned about intolerance. Similarly, many libraries or children's sites already have lists of approved educational URLs which could grow into extensive greenlists.

Finally, development of red- and greenlists has been seen by many entities as a profitable business opportunity and would likely continue to be so within a multi-party rating system. For third party list compilers who see potential profit in the work, few other incentives are needed.

- Conclusions: MPLRM

o General Advantages and Disadvantages

As suggested above, a great strength of the multi party rating system lies in its flexibility for use across national boundaries and culturally diverse consumer groups. The system allows parents a great deal of responsibility and control over the type of content which reaches their screen. This division of rating labour is also well-suited to the sheer size of the Internet.

On the other hand, a multiparty rating system may be "leaky" in comparison to some of the other systems described above. Some content will inevitably be rated inaccurately by content providers. Although the third party list system provides a safety net for this eventuality, the system cannot be foolproof and some objectionable material may inevitably reach users' screens. For those parents willing to exclude most Internet resources in exchange for absolute guarantees of child-safe content, other solutions, such as walled gardens or third-party greenlists may be appropriate. (As noted above, however, *any* system except a strictly controlled walled garden will be vulnerable to content change over time.) A multi-party rating system is also critically dependent on the labelling efforts of content providers and third parties. Without a critical mass of these participants, the system cannot succeed. The following list summarises strengths and weaknesses of the multi-party rating model.

Strengths of the MPLRM

- Makes possible comparatively thorough coverage of the net.
- Enables individual parental control of content filtering.

[49] (see http://www.ispo.cec.be/legal/)

- Allows flexible adaptation across diverse cultural groups.
- Draws on existing, globally applicable technological standards.
- Operates with no direct cost to parents or content providers.
- Has the backing of major industry participants, such as Microsoft and NSI.

Weaknesses of the MPLRM

- Allows inconsistency in application of labels by relying on content provider perspective.
- Relies on voluntary first-party rating, without clear means to persuade parties to rate.
- Relies on voluntary third party list-making, without concrete assurances that proposed list makers will take on the task.
- Slow implementation by content providers makes the system less valuable to parents, while slow implementation by parents limits content-provider incentive to self-rate.
- Without an income source from content-providers or users, a programme such as ICRA may be financially precarious or dependent on corporate sponsorship.
- The system cannot block access to non-HTML resources.
- ICRA's rating system does not include privacy and financial transactions as categories for first-party rating.

o Challenges and Conclusions: MPLRM

Many serious commentators familiar with the Internet believe that the technological structure of the web will defeat all regulation and filtering efforts. This belief is bolstered by the phenomenal size, decentralized structure, and flexibility of the medium. If these critics are correct, then true parental control and child Internet use may be fundamentally incompatible. Parents may be forced to choose between granting children access to the web despite inadequate filtration and effectively denying children Internet use by restricting surfing to the comparatively tiny reaches of walled gardens.

Monitoring, labelling, and rating the Internet is a task far beyond the capacity of any one organization. A filtering system which seeks to allow true Internet access while facilitating parental control must necessarily distribute these burdens as broadly as possible. The multi-party rating system represents the most balanced current model for such distribution. In order to satisfy culturally diverse groups of parents, a viable rating system must facilitate individual selection of filtering criteria as well as allow parents to control content by bypassing these criteria to establish absolute blocking rules for particular sites. Again, the multi-party rating system meets these criteria.

This filtering system can only be truly valuable to parents, however, if both content providers and third parties participate by labelling sites and creating lists. This consideration represents the most serious challenge for successful Internet filtering. The long-term success of a multi-party filtering model depends on the momentum gained by NGO, government, and industry filtering advocates in encouraging adoption of labelling. If they are unsuccessful, parents may be left to choose either Internet access or parental content control, but not both.

Part III.
Customer Experiences and Preferences

Both television and Internet content are commonly seen as potentially dangerous or inappropriate for children and many parents express interest in controlling their children's viewing or using habits. Parental concerns regarding the Internet are generally stronger, reflecting the far higher availability of content unsuitable for children via that medium. In the U.K., one in three parents reportedly sees the Internet as more dangerous to children's moral well-being than either television or film.[50] While research shows national differences as to which *type* of content is deemed inappropriate, parents consistently report an overall concern about children's exposure to inappropriate content in general and the Internet in particular.

This section will summarize conclusions from a variety of consumer reports. It contains information gleaned from broad surveys, consumer forums, online questionnaires, and other research methods. Sources represented include:

- ITC Independent Television Commission / BSC Consumer Forum (cross-section of 200 UK participants)[51]
- INCORE Report to the European Commission (product test groups, web questionnaire with 681 European respondents, review of previous research)[52]
- IDATE, Insitut de l'Audiovisuel et des Télécommunications en Europe, Report to the European Commission on Rating Mechanism[53]
- Bertelsmann Foundation Internet User Survey (survey of 1000 people in the US, Germany, and Australia)[54]
- Which? Online Internet Survey 1999 (UK)[55]
- Internet Watch Foundation (UK online survey)[56]
- Freedom Forum First Amendment Survey (United States)[57]
- PCMLP Report on Parental Control of Television Broadcasting[58]
- Kaiser Family Foundation National V-Chip Survey (United States)[59]
- Annenberg Public Policy Center's Report on Family Rules and Children's Media Use in the Home (United States)[60]

3.1. Categories of Content

Several recent research efforts have queried consumers about their content concerns, asking which categories of content they want to be able to block. While many of the same categories are mentioned by all consumers, there are striking differences in the significance assigned to various categories by different national groups. In particular, American respondents expressed worry about sexual content, while some European respondents (particularly in Germany) focused on racism and intolerance.

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[50] National Opinion Poll result, cited at http://www.zdnet.co.uk/news/2000/22/ns-15806.html
[51] http://www.itc.org.uk/news/news_releases/worddocs/upl_298.doc
[52] http://www.incore.org/final_report.htm
[53] IDATE report, Development of Digital Television in the European Union, June 2000.
[54] http://www.stiftung.bertelsmann.de/internetcontent/english/content/c2360.htm
[55] http://www.which.net/whatsnew/pr/may00/which/netnannies.html
[56] http://www.iwf.org.uk/rating/rating.html
[57] http://www.freedomforum.org/
[58] http://europa.eu.int/comm/dg10/avpolicy/key_doc/parental_control/index.html
[59] http://www.kff.org/content/archive/1477/
[60] http://www.appcpenn.org/ppfr.pdf

INCORE's report, which focuses on Internet filtering, represents the broadest cross-section of European consumers.[61] Numerical results from this research will be included below. Because different consumer research projects asked slightly different questions (i.e. "what content do you want to block" as opposed to "what content do you want to *be able* to block,") comparisons of survey results are not helpful; where other figures are included they should not be compared to the INCORE findings.

Sexual content, particularly pornography, was mentioned by consumers in nearly all research. Concerns about this content were generally greater in the United States than in much of Europe or Australia. Those studies which asked respondents about specific contextual factors for sexual content, such as artistic use or medical information found strong consumer support for incorporating this distinction into any blocking or filtering system.[62] 61% of INCORE respondents wanted a "sex" blocking category.

Violence was also an object of significant parental concern, with less variation across national boundaries. The Internet Watch Foundation report includes a more detailed breakdown of types and contexts of violence, with varying support for different subcategories. 70% of INCORE respondents wanted a "violence" blocking category.

Privacy was among the greatest concerns for many people, and was listed by INCORE as one of the top four filtering worries of respondents, with 67% support.

Sites allowing *financial transactions* also raised concerns. A majority of Bertelsmann respondents (in the US, Australia, and Germany) wanted to be able to block access to shopping, and over 80% of Internet Watch Foundation shared this preference. INCORE did not ask about precisely this category, but did find 67% support for filtering sites requiring financial information.

Intolerance (including e.g. racism) was of concern to a majority of respondents in all countries, but was particularly emphasized by German respondents. 54% of INCORE respondents wanted an "intolerance" blocking category.

Nudity is an important category for some American consumers (43% of American Bertelsmann respondents), but of lesser concern to most Europeans. 32% of INCORE respondents wanted a "nudity" blocking category.

Potentially Harmful subjects, such as drug use, suicide, or bomb-making, was a preferred filtering category for 41% of INCORE respondents.

Indecent Language was subject to differing levels of concern in different countries, but was not listed as one of the most important issues by any group. INCORE did not include this as a category, but Bertelsmann found support for it among 45% of Germans, 41% of Americans, and 38% of Australians.

Context Categories to "redeem" otherwise objectionable content appearing in news reporting, art, educational, or other similar use were supported by most people.

3.2. Methods of Parental Control

Consumer research consistently reveals preferences for user control over content filtering, rather than reliance on external or upstream blocking systems. As the Independent Television Commission (ITC) summarized in its findings, "users want to take responsibility for what they access."[63] One of the few reports to directly consider parental control in a converged media environment, the ITC forum also found that consumer opinions were the same whether material was accessed via PC or television. In addition, as consumers learned more about the Internet, preferences for user control increased.

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[61] This section of INCORE's report included responses to an online questionnaire about filtering categories, with responses largely from German, French, Dutch, and English users. As INCORE notes, this was a self-selecting group of relatively Internet-savvy users, and hence is not a statistically pure survey.

[62] IWF and INCORE

[63] Internet Regulation: The Way Forward. London: ITC report, 1999

Parental control models include all of the television and Internet filtering models described above. As indicated in that discussion, however, some systems facilitate a greater degree of individual control than others. Relatively little research has probed differing consumer preferences among these *models*, although some (discussed below) have compared consumer experience with particular, currently available options. The product testing section of INCORE's research provides some of the only available insight into consumer response to different parental control models. INCORE found that most participants in the tests supported content provider self-rating and end user filtering (like the ICRA system described above), although this preference was not expressed relative to other options. As discussed below, however, most testers also concluded that they would not use the system until more labelled sites became available.

Proposals for government or access provider responsibility for blocking content on the Internet received at best tepid support in most research addressing this issue. The Bertelsmann survey found 31% of German and American respondents would prefer that government agencies make such decisions, although more favoured some role for government in monitoring and enforcement. Similarly, ITC found only 33% of Britons supported government or ISP responsibility.

3.3. Existing Parental Control Methods

Existing parental control systems are generally weak. Research suggests that many parents do not employ even freely available parental control devices for television filtering. When they do use them, they are often dissatisfied.

Recent research on implementation of V-Chip filtering of television content in the United States shows relatively little use of the device. According to the Kaiser Family Foundation, among parents with V-Chip-enabled televisions, only a third have implemented filtering. Almost 40% of all parents remain unaware of the technology's existence.[64] Other studies suggest that only half of parents are aware of television rating systems and 90% do not know the ratings of shows watched by their children.[65] Consumer response to digital television blocking devices in Europe has been mixed, with some users (particularly in Germany) complaining that the devices are too complex.

For Internet filtering devices, user dissatisfaction is widespread. After field-testing five commercial software filters in six European countries, the Insitut de l'Audiovisuel et des Télécommunications en Europe (IDATE) reported to the European Commission that, "On the basis of their initial expectations, most of the reviewers were profoundly disappointed by the tested filtering software."[66] This study, which used 95 testers from Finland, France, Germany, Italy, Spain, and the UK, tested the Cyber Patrol, Cyber Sitter, Cyber Snoop, Net Nanny, and Surf Watch systems. Many testers complained about difficulty in installation, although most agreed that the software was easy to use once installed. Concerning the actual filtering performance of the systems, 55% of the testers said they were unsatisfied. 88% of this group said the filter failed to block harmful content still reached them, while 64% complained of inconsistent treatment of similar or identical material. Particular problems arose in failure to block non-English language sites, violence, hate speech, and drug-related material. At the same time, 25% of all testers complained that filters "over-blocked," concealing inoffensive content from the users. The IDATE report notes that some filters barred access to non-erotic homosexual special interest sites such as www.gay.com, as well as sites concerning sexually transmitted diseases.

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[64] Dale Kunkel, Wendy Jo Maynard Farinola, Kirstie M. Cope, Edward Donnerstein, Erica Biely, and Laura Zwarun. *Rating the TV Ratings: One Year Out: A Report to the Kaiser Family Foundation*. University of Calitfornia, Santa Barbara (September 1998).

[65] Annenberg Public Policy Center, http://appcpenn.org

[66] IDATE report, Development of Digital Television in the European Union, June 2000: 6. Applicable homepages: http://www.opentv.com/ and http://www.canalplus.

User experience with self-rating based systems has been equally troubled. INCORE conducted field tests of parents and teachers in France, Germany, Spain, and the UK, asking them to use both the SafeSurf and RSACi (ICRA's predecessor) systems. Most users found the systems easy to set up and use and expressed support for the model. However, all but a few English-speaking testers concluded that the systems as currently implemented were not useful. Too few sites – and in particular, too few non-English language sites – had self-labelled. Testers were frustrated by the options of accepting unrated sites, including a great deal of offensive content, or rejecting unrated sites and losing access to much of the web.

Part IV.
Models for a Converged World

At present, various commercial and non-commercial entities have plans to develop converged digital television and media delivery systems. Forecasting the technological characteristics of the systems which may ultimately emerge is beyond the scope of this report. Certain functional attributes of the converged environment, however, can be expected regardless of the precise means of technical implementation. In particular, this report will assume that means to transmit metainformation and means for users to sort content based on that metainformation will develop to serve general user needs in the converged environment, and will therefore be available for use in parental control systems.

4.1. The Elements of a Parental Control System

A blocking system in a converged media environment can be broken down into the following (four) elements:

- Rating Terminology
- Rating Entity
- Rating Transmission Method
- Implementation of Filters

▪ Rating Terminology: Defining a Common Language for Metainformation.[67]

The rating terminology adopted by a filtering system is perhaps the most complex and important of the four elements; it may determine the system's success or failure. By selecting a set of ratings categories, the filter designer creates a "language" by which all content will be described. The power of this language will largely depend on two factors. The first factor, internal to the terminology, is *what information it can express*. The second, external to the terminology, is *how many people use it*.

• The Information Expressed by a Rating Terminology

The more categories a terminology uses, the more accurate its metainformation – and more accurate metainformation allows more control over content filtering. Simple, binary ratings, designating each item of content as merely "to be blocked" or "not to be blocked," convey hardly any information at all. More detailed ratings convey better information, but refinement is always possible: for example, a "contains nudity" label is not as informative as precise labels detailing the gender of the nude person, the body parts shown, or the duration of the image. With increasingly detailed categories, however, the cost or labour requirement of creating labels (and, to a lesser extent, implementing filters) increases as well. Any rating terminology must balance these considerations in determining how many categories to use.

o Evaluative Terminologies

Evaluative ratings express a subjective conclusion about content, such as "suitable for children over twelve." In most countries, film and television rating systems use evaluative categories to rate content. This approach is useful where rating systems aim to express a unified

[67] This element is technically not present in text or graphics screening systems which filter for content itself, rather than relying on metainformation.

cultural norm or consensus about child-appropriate material. However, by comparison to descriptive systems, they are less amenable to informed, diverse parental choice. (Note that "deterministic" evaluative systems, which require raters to express in objective terms *why* a film is unsuited for certain viewers, effectively provide descriptive information.)

o Descriptive Terminologies

Descriptive ratings list an item's potentially objectionable elements in value-neutral terms. "Contains images of nudity" is an example of a descriptive label. Like ingredient labels on food, these labels are as informative and objective as possible.

A descriptive rating terminology gives parents greater responsibility and control than an evaluative one, because it allows parents to judge content by the specific criteria important to them. Descriptive labelling systems are therefore more adaptable to use by culturally and ideologically diverse families. In order for the terminology to be useful to diverse consumers, though, it must include categories capable of describing content valued or opposed by each group.

If a descriptive rating terminology is sufficiently detailed and value-neutral, it can provide relevant and comprehensible metainformation to families with very diverse needs. The same characteristics which make it flexible and adaptable to multiple consumers could also make such a terminology useful across national boundaries and varying media platforms. This attribute is important for the consideration of the extension of rating systems beyond the national or media-specific context, discussed below.

• How Many People Use a Rating Terminology

In an automated filtering system, labellers must describe content using exactly the same terms that filterers use to block it. These terms may be standardised across a medium, a nation, or any other cross-section of content providers and consumers. The more widely the terminology applies, the more useful it is to both groups. Like any standard, a rating terminology is subject to network effects: the more labels use it, the more valuable it is for filtering, and vice versa.

o Localised Rating Terminologies

The rating terminologies familiar from traditional media are largely limited or "local" in application – they describe only films, for example, or apply only in one country. These systems have the advantage of user familiarity and established political acceptability. However, they create difficulties in distribution, as content must be re-rated for new national jurisdictions or new media distribution channels.

o National Rating Terminologies

National rating terminologies can be maintained as elements of filtering systems in a converged environment if the delivery system ensures limitations on content access based on national boundaries. This limitation is likely to be possible for television content, but not for Internet content (unless draconian upstream filtering measures are implemented). Hence, if the television content of a converged environment retains national ratings, a parental control system will have to use different rating systems depending on mode of content delivery.

o Media-Specific Rating Terminologies

Media-Specific Rating Terminologies could be used in a converged environment parental control system, and may have to be used unless a satisfactory alternative is developed. However,

they are unlikely to appeal to content providers or to parents. Use of two (or more) parallel terminologies could lead to inconsistent treatment of content simply because of differences in the mode of delivery. Moreover, multiple rating terminologies would complicate the user interface, forcing parents to negotiate two inconsistent systems in a single device.

- Proprietary Rating Terminology

A proprietary rating terminology might have only "localised" application because an owner of intellectual property rights in the standard only allows licensees to use it. Content providers could conceivably be charged to label using proprietary categories, or parents might be charged to use them in filtering – either of which would retard development of a widely used filtering system. More plausibly, each content packager or content delivery provider might develop a standard exclusively for its own system. This could result in a Babel of conflicting standards, and lead to overall less effective filtering by comparison to an open standard. (It should be noted, however, that the administrator of an open standard may still need intellectual property rights in order to prosecute fraudulent use of the rating terminology.)

- Other Terminology

Other localised rating languages might emerge if particular cultural groups felt undeserved by existing standards and determined to develop a terminology of their own. For example, an Islamic NGO or business in Europe may develop a rating terminology of its own, perhaps drawing on existing film or television classifications from an Islamic nation.

- Universal or Universally Translatable Terminologies

As international and multimedia distribution of content becomes common, the inconsistencies of localised rating terminologies place increasing burdens on content producers. Inconsistent ratings standards also make development of filtering systems for a converged media environment more complicated. Ideally, a universal rating system, valid across national boundaries and across media, would resolve these complexities. More realistically, standardised and well-crafted descriptive rating terminology could make possible "translations" from localised ratings systems.

As discussed above, one advantage of a detailed descriptive rating terminology is its flexibility – each parent can approximate his own evaluative filtering criteria by selecting a particular combination of descriptive categories. In just the same manner, traditional ratings such as those issued by national film boards could be expressed in terms of underlying objective factors, using a standardised descriptive terminology.

For example, French television ratings sort content into four tiers, depending on suitability for children. If French rating authorities developed templates specifying exactly which categories (or combinations of categories) in the standardised descriptive rating terminology correlated to each of these tiers, then any descriptive label could be translated into French television rating terms. A "red square" (prohibited to minors under age 16) rating might automatically issue, for example, to any content with a label indicating "lethal violence toward humans" *or* to any content labelled both for "non-lethal violence to humans" and "obscene language," etc. Following this system, a single reliable descriptive label could be automatically converted to numerous national and media-specific ratings systems.

Conversely, traditional ratings categories could be defined in terms translatable into the common descriptive terminology. Translation from broad categories of national ratings systems into

precise ones of descriptive labelling would raise some complications, but these would not be insurmountable. [68]

Translation of ratings from outside systems into common descriptive terms and vice versa could be automated through the use of templates – pre-configured lists of descriptive labels which correlate to a particular rating. This translatability would vastly simplify filtering in the converged environment, by allowing both content creators and users to apply filtering systems consistently across media.

Obviously, such an approach would require significant effort in standards development. As discussed above, however, this effort is already well underway in the Internet context. ICRA's descriptive rating terminology, with fifty categories, could theoretically form 1,125,899,906,842,624 (two to the fiftieth power) different configurations. Even if we assume that many categories are mutually exclusive or duplicate information (like a "full nudity" and a "partial nudity" category), and base calculations on only twenty categories, 1,048,576 descriptions can still be expressed. This degree of flexibility would reasonably support conversion templates for most existing rating systems. Direct adaptation or expansion of this system for a converged environment offers one attractive shortcut for construction of a non-localised, translatable rating terminology.

It is worth noting the existence of several other impressive efforts toward harmonization of inconsistent ratings standards. Holland's NICAM (cfr Supra) has pioneered the development of national rating terminology for consistent application across media. The project has made significant strides toward standardisation of television, film, and other ratings, but has not yet solidified plans for Internet rating. A related development is occurring in entertainment software rating, which is to an impressive extent standardised throughout Europe by the Entertainment Leisure Software Publishers Association.

- **Rating Entity**

All models below should be read subject to a caveat: any media environment which includes the Internet will have unrated content; the same could potentially become true of television as volume of material expands. A reasonable parental filtering system would therefore include an option to block or accept unrated content.

It should also be borne in mind that the models below are not mutually exclusive – as demonstrated in the Internet discussion, strong filtering systems may be built by combining different labelling and rating responsibilities.

- Content Creators Rate Material

As discussed in the Internet section, above, the strength of a self-labelling approach lies in its coverage: far more material will be rated if content providers do the job themselves. A self-rating approach distributes the task of labelling widely, and makes persons already familiar with content responsible for describing it. This approach also avoids the necessity for large-scale ratings organizations. The downside, of course, is that labels may be inconsistently and unreliably applied. One means of correcting this is by supplementary third party rating. However, the problem may be far less significant for television content in a converged environment than it has been for Internet content. Content creators who produce television shows typically have legal or contractual ties to content packagers, as well as ongoing business relationships; their incentive for self-rating at the request of packagers is far greater than that of Internet content producers. Completion of a self-

[68] As Jack Balkin has suggested, one approach would be for the translation algorithm to assume that content rated "Age 17+" contained the maximum objectionable content allowable for that rating, and issue a "worst case scenario" descriptive label. Content distributors would then have incentives to re-rate the material using common descriptive categories in order to keep it from being blocked.

rating questionnaire could easily become a standard administrative task for television content producers. If this became an industry norm or standard contractual obligation, government regulators might also be more willing to shift some legal duties of content regulation off of content packagers.

- Content Packagers Rate Material

This approach places a far greater burden on content packagers, who would have to assign personnel to monitor and rate content. If rating or labelling were a legal obligation, government regulators might reasonably place the burden on packagers, much as they currently give broadcasters responsibility for complying with regulatory restrictions on content. In this case, two outcomes seem likely. Content packagers might insist upon a vastly simplified labelling system, to the detriment of the overall parental control system. Alternately, they might contractually shift responsibility for rating onto content producers (much as many networks currently rely on content producers to comply with existing regulations).

The application of this approach to Internet content is questionable. Much Internet content is placed online by creators, without the mediation of a recognisable "packager."[69] A packager rating model might therefore introduce distortions in the treatment of content depending on the means of delivery within a converged environment.

- Outside Organizations Rate Material

Finally, organizations not associated with the production or distribution of content might be responsible for rating or labelling. Third parties might provide descriptive or evaluative ratings for content. Alternately, an organization might focus on a single rating criterion (such as "suitable for age 12+" or "promotes ethnic intolerance") and simply rate sites "yes" or "no." This would effectively create greenlists and redlists of the sort currently used for much Internet filtering.

o Central Government or Government-Sanctioned Organizations

A centralized version of this model is familiar in many countries from existing systems for film and other classification. Under these systems, government or centralized, government-sanctioned organizations preview all material prior to release, and assign a rating. As Holland's NICAM project demonstrates, these regimes may be expanded to provide comprehensive content ratings regardless of medium. This approach obviously centralises the cost of monitoring and rating. Like content packager rating, concentrating the burden of rating may drive rating organisations to insist on simpler rating criteria, with a resulting shift toward more evaluative (rather than descriptive) and less flexible ratings. The costs of truly thorough rating through this approach would be tremendous.

o Non-Governmental Organizations

Another approach, recommended by some commentators in both the Internet and digital television context, is provision of diverse ratings by multiple NGOs. This approach poses several practical hurdles. First, few organizations are likely to have the resources for thorough rating outside of specialized areas of interest; coverage of all available content would therefore be unlikely. Second, this approach would not facilitate rating prior to release unless content creators co-operated closely with ratings organizations. Finally, a third party without government powers would have little power to "attach" its rating to the content of an uncooperative producer. Thus, third party

[69] Web-hosting and portals may be called "packagers."

ratings might only be available through indirect transmission. Although NGO third party rating is quite useful as a supplement to broad rating systems, it may be inadequate as a model for systematic provision of labels or ratings.

o Businesses

Current commercial Internet filtering products offer an example of third-party rating by for-profit organizations. Businesses could continue this task in a converged environment, either as specialists (rating only scientific information sites or art sites, for example) or as more ambitious overall raters. This approach shares most of the weaknesses of the NGO rating approach, discussed above: raters would have difficulty reviewing more than a fraction of available content, they would have difficulty gaining pre-transmission access to dynamic content, and they might only be able to supply rating information by indirect transmission. A profit-driven approach could have two advantages over a non-profit system, however. First, for-profit raters might have resources to provide more thorough coverage, and second, contractual guarantees to customers might drive greater care and reliability. However, as complaints about commercial Internet filters suggest, this system has so far produced only partially reliable filtering systems. (See above)

4.1. 3. Rating Transmission Method[70]

There are two significant means for delivering metainformation to customers: bundling or associating it with the content for direct transmission, and providing it separately, by "indirect transmission" with an indexed reference to the content.

- Direct Transmission of Bundled Metainformation

In this method, ratings information is enclosed with the content it describes. A user's filter can determine whether or not to block content simply by looking at the file or broadcast itself. PICS labels in the header of an HTML file are an example of bundled metainformation, as is the broadcast signal detected by V-Chips. Bundling metainformation is practical when, as on digital television and the Internet, there is enough free "space" in data transmission to carry detailed labelling information. In most cases, however, metainformation can only be added to content by a party with control of that content – meaning the creator or in some cases the distributor. Thus, this approach is most practical when that party is co-operative with the rating system. Finally, since not all forms of content support metadata bundling, rating delivery systems that use this approach have to rely on some supplemental measures.

For bundled or associated directly delivered metadata, automated filtering depends on a standardised machine-readable language shared by the label and the filter. In the Internet context, this language already exists: PICS is a shared, non-proprietary language for expressing any metainformation (not only ratings). A converged environment might use PICS, build on it, or develop a new standard for conveying labelling information. Some proposals for television metadata delivery already draw on the XML language, into which PICS labels could be incorporated.[71]

- Direct Transmission of Associated Metainformation

In some cases, formats which cannot support bundled metadata can be delivered alongside or "wrapped" in a format which does contain the relevant information. For example, although

[70] This element drops out of most upstream filtering models, since rating and blocking execution are carried out by the same entity.
[71] TV-Anytime Document AN-130

graphics files on the web do not have meta tags, PICS labels in HTML files effectively block images. Users access graphics files through particular webpages – HTML files – and those files contain labels describing associated graphics. A similar approach might be used in a converged Internet environment, using a simple format like HTML to add labelling information to more complex content transmission. The "wrapped" transmission approach will be technologically feasible only for some types of content; for others, it may be necessary to design new means to include metainformation (as has been proposed for streaming audio files) or to rely on the indirect transmission systems described in the next subsection.

The associated metainformation solution could also be useful for intermediaries who wish to add ratings to content produced by someone else. Alteration of the content itself (for example, adding new meta tags to an HTML file) may be impossible or inappropriate. However, if new information can be attached as a "wrapper," filter users will be able to treat it as directly transmitted information. So, for example, if an access provider held a list of all websites deemed unsuitable for children by a teachers' association, it could attach this rating as metainformation to relevant transmissions en route to a family computer. The final decision about filtering would then remain in the hands of the parents.

- Indirect Transmission and Indexing by Unique Identifiers

Another way to correlate metainformation to the content it describes is through indexing – providing metadata separately from content, but with a clear indication of its reference point. This indirect transmission is familiar as the device used by green- or redlist Internet filtering models and most EPGs.

An indirect transmission system requires a means of accurately correlating metainformation to content. For web content, this is simple, because all content can be uniquely identified according to its location, using a URL. Equivalent "location" descriptions for traditional television would include channel and time of transmission, much as paper programme guides do. This indexing device is poorly suited to filtering, however. First, variations between expected and actual transmission time can result in inexact identification and blocking of content. Second, a rating cannot be permanently indexed to a programme, but must instead be re-indexed each time the programme reappears at a new time or on a new channel. A more reliable system for correlating indirectly transmitted metainformation to content would rely on a unique identification code or number for each programme. This unique identifier would itself need to be transmitted directly, as bundled metainformation, either at the beginning and end of the programme or continuously. Current projects for time-shifting of televised content, such as TV-Anytime, may develop universally or locally unique content identifiers which would be adaptable to parental control purposes. The World Wide Web Consortium is also developing web-based uniform resource indicators for television content (see above).

Indirect transmission of ratings is useful when the information needed by a consumer cannot reasonably be bundled with the content. For example, if a parent wants to use ratings from a civil rights organization to filter racially intolerant content, an indexed redlist may be the only source for these ratings. However, systematic use of indirectly transmitted ratings for all content may pose serious practical difficulties. If the rating information for all content in a converged system were stored on the user's system, memory requirements would be astronomical. If rating information were stored in some third, networked location, such that a user's machine had to check a reference number against an index at that location each time it accessed content, the volume of traffic to the list location might substantially slow down service.

- **Implementation of Filtering**

- Upstream Blocking

Several entities “upstream” from the user have the potential to block content transmission, using any of the techniques described above. Consumer response to various studies has indicated strong preference for parental control over blocking and filtering; upstream solutions are probably unsuited to most families. However, some parents may find upstream blocking simpler or may prefer it because they fear that children could bypass locally implemented filters. For this group, it may be helpful to have upstream blocking available as an option, and perhaps as a paid service.

- Blocking by the Access Provider

The controller of the conduit through which content flows to the consumer is an obvious candidate to carry out blocking activities. ISPs, cable providers, and other entities in the access business are well-positioned to filter content. Large scale filtering at this level, however, might require significant data processing resources beyond those currently available. Moreover, since such filtering would presumably implement a single blocking standard, it could not flexibly accommodate the diverse preferences of various families and would be vulnerable to charges of censorship.

- Blocking by a Third Party

Another source of upstream blocking might be a third party, perhaps one which offered filtering as a paid service to users. This approach would raise many of the same technological questions about volume of traffic and information processing as access provider filtering. It would also introduce additional technological hurdles, as third parties do not already control bottlenecks in the information stream and would therefore have to divert the flow. Third party blocking systems might facilitate a somewhat greater degree of consumer choice, however, in that different third parties might offer different blocking criteria.

- Customer Blocking

Blocking at the level of the family's own machine offers the greatest potential for user autonomy and diversity of implementation. With filtering software at the browser level (or elsewhere within the user's immediate control), individual blocking options can be as flexible as the rating terminology will allow.

Depending on the available filtering system, customers may (a) select which metadescriptors to block, relying on a shared set of terms used by the metadescriptors and the filter; (b) select and use red- and greenlists from ideologically compatible third parties, or (c) combine the two approaches, using third-party green- or redlists to supplement a label-based filtering system. As discussed in the Internet filtering section, the combined option may offer the strongest balance of flexibility, fine-tuning, and reliability.

For the user as for the rater, *templates* may significantly simplify the process of label- or rating-based filtering. Organizations such as religious or educational institutions may offer pre-set filter configurations as templates for parents to use on their own systems. If a parent prefers not to set specific filtering levels for himself, he may opt to obtain a template file from such a third party and simply use its settings.

Since much content (particularly on the Internet) is likely to be unrated, an important choice in filter configuration would be the treatment of this material. Parents should be able to decide whether to admit or block content that has not been rated. Obviously, this choice would depend on the degree to which ratings were adopted – if most adult material were rated, a parent would feel much safer in assuming that unrated content would be mostly inoffensive. An effective customer filtering solution would involve the following elements.

- *Password Protection*: Parents should be able to override or reset filters using a secret code, unknown to the children.
- *Security:* The system should not be easy for technologically savvy children to circumvent.
- *Transparency:* If the parent chooses, the system should notify the user when a site has been blocked, and for what reason, and provide a password override option.
- *User-Friendly Interface*: The user interface must be very easy to find, install, and operate, even if the filtering system itself is quite complex.

It is important to note that the customer filtering option could also be adapted by schools or other local area networks. A network administrator with control over a group of machines could easily implement filters for the whole system.

4.2. Possible Models for a Parental Control System

The above discussion has outlined four necessary elements of a parental control regime, and described several options for the development of each element. By "mixing and matching" one or more options from each of the four categories, a number of models can be developed.

Rating Terminology	Rating Entity	Rating Transmission Method	Implementation of Filters
Information Expressed • Evaluative • Descriptive Of Users • Localised • Universal or Translatable • National • Media Specific • Proprietary • Other	Content Creators Content Packagers Third Parties • Government • NGOs • Businesses	Direct Transmission of Bundled Metainformation Direct Transmission of Associated Metainformation Indirect Transmission and Indexing by Unique Identifiers	Upstream of the Customer • Access Provider • Third Party Customer

Below, the Report will discuss several possible combinations, beginning with the one deemed strongest. Each possible model will be considered in light of the nine evaluation criteria outlined in the initial proposal for this Report as endorsed by the DVD Regulatory Group.

4.2.1. Multi-Party Rating System

This model builds on the Internet rating and filtering system developed by ICRA and theorized by Jack Balkin in his "layer cake model," extending that system to a converged media environment.[72]

Functional Elements: Multi-Party Rating System

Rating Terminology:	Descriptive for content producer self-labelling and Evaluative for third party lists.
Entity responsible for Rating:	Content Producers and Third Parties
Rating Transmission Method:	Direct for content producer self-labelling and Indirect for third party lists.
Implementation of Filters:	Customer

This Report has included lengthy consideration of multi-party rating in the Internet context; the reader is referred to section 2.2.5, above, for detailed treatment of the topic. The following section will provide an overview of the multi-party rating system (MPRS) in a converged environment, followed by analysis in light of the evaluation criteria.

[72] See Appendix 5 for "layer cake model."

An MPRS in a converged Internet-digital television medium would rely on content producers to incorporate labelling information in material that they provide. These labels would use a standardised, descriptive language readable by users' filters, possibly building on existing PICS standards and ICRA rating terminology. Labels would transmit directly with the content, so that user-end filters could immediately recognize and block inappropriate material. As a second tier in the system, third party organizations would provide redlists or greenlists of approved or disapproved content. These lists would correct and supplement content producer labelling. This third party input would allow parents to fine tune their filter settings to reflect cultural or ideological preferences, and help to sort ambiguous categories such as artistic use of nudity or violence. Parents themselves would control filter settings, or use third party-produced templates to automatically select filtering criteria.

Evaluative Criteria Analysis: Multi-Party Rating System

Role of Key Players:	The multi-party rating system gives content producers, third parties, and parents themselves primary responsibility for implementing rating and filtering. However, content packagers play a significantly larger role in the broadcasting environment than online, and can be expected to do so in the converged environment as well. Hence, in a converged world, an MPRS might draw more heavily on packagers. (Partly because, in the television content more than the Internet content, packagers stand to lose revenues if users block unrated content.) Packagers might use their market and contractual power over content providers to encourage them to label their products.[73] Because they control so much content – and such popular content – their actions could be critical in building recognition of the MPRS labelling language. Through network effects, this could promote both user adoption of the system and self-labelling by other content providers.
Cost of Implementation (capital and running):	Because the system relies almost entirely on voluntary participation, running costs are relatively low and widely distributed across system participants. Capital costs may come from three major sources. (1) Independent development of the necessary hardware and software for metadata transmission and user filtering could be quite costly. However, the MPRS draws on elements (metainformation, user filtering) already existing or under development for search and navigation systems. If this technology can easily be adapted for parental control purposes, costs could be significantly mitigated. (2) Development of a technical standard and rating terminology for self-labelling would impose some costs, unless the system drew on existing Internet standards. (3) As with any rating system, developing labels or ratings for older, existing content would impose costs, though conversion templates could be used to create descriptive labels for those already rated under other systems or broadcast under clear-cut content regulations.
Paid vs. Free Consumption Environment:	The MPRS would not necessarily be any different in a paid environment than in a free one. However, a paid environment would create certain business opportunities relating to accuracy of labels. A content provider or contract packager might offer customers stronger assurances or guarantees of label accuracy as part of the appeal of paid content.

[73] Alternately, they might translate their existing child protection standards into a labelling template, and apply this consistently to content which they make available. The latter approach would be slightly less burdensome to content producers and packagers. However, it would be less useful to parents, who might prefer more accurately labelled content. Moreover, in order to avoid exposing children to inappropriate content, such a template would have to reflect "worst case scenario" labels, which could cause more innocent content to be blocked unnecessarily.

Mapping with Existing Systems:	As the discussion above indicates, MPRS could map directly with existing Internet rating systems. Application of this system to television content would require some adaptation, however. (1) The rating language would be a substantial departure from most existing television rating systems, although the conversion templates described in section 4.1.1.1.2. above might ease transition. (2) Making content providers formally responsible for self-rating would not be a drastic change from current practice.
Simplicity for Users:	If MPRS filter configuration were carried out through a set-top browser, it could be made reasonably simple for users, particularly through the use of templates for automatic filter configuration.
Flexibility and Internationalisation:	MPRS would be exceptionally flexible. Because content producers would use descriptive rather than culturally specific evaluative rating terminology, both translation of label information into other languages and comprehensibility across cultures should be maximised. Moreover, as any group can develop third party lists, introduction of additional filtering criteria for particular language, culture, or interest groups is possible.
Time Scale of Implementation:	This depends largely on the ability of the MPRS to build on existing technologies, as discussed in the Cost of Implementation analysis.
Practical Concerns:	(1) The processing power required to handle MPRS is not tremendous, but could possibly surpass current set-top box capacity. (3) For Internet content in particular, a critical mass of self-labelled sites is critical and not yet available. (3) The new ICRA rating terminology and implementation of third party lists have not yet been thoroughly tested by users; any undetected flaws in their Internet system could indicate problems with the MPRS model for the converged environment.

- **Multi-Party Rating With Domestic Regulation of Some Content**

This model assumes that content packagers are made legally responsible for directly transmitting ratings with some content, using a localised rating terminology such as national television board ratings. The parental control model would then incorporate user filtering based on national rating terminology for some content and descriptive rating terminology for the rest, with third party lists covering both groups.

Functional Elements:
Multi-Party Rating With Domestic Regulation of Some Content

Rating Terminology:	Descriptive (for domestically unregulated content) and Evaluative (for domestically regulated content)
Entity responsible for Rating:	Content Packager (for domestically regulated content) and the Content Producer and Third Parties (for domestically unregulated content)
Rating Transmission Method:	Direct and Indirect (for third party lists only)
Implementation of Filters:	Customer

Given the international character of the converged environment, national ratings requirements would inevitably split content into two categories: *domestically regulated* content, carrying bundled rating information expressed in national categories; and *domestically unregulated* (international) content without national ratings. This split might simply reflect differences in transmission medium, with television content carrying domestic ratings and Internet content not. Alternately, some Internet content might fall on the "domestically regulated" side of the divide – a government might impose ratings requirements on all national Internet content producers, all national producers of

streaming media, or all national producers of streaming media with audiences over a certain size. Otherwise, some television might fall on the "domestically unregulated" side. Wherever the dividing line falls, the result will be that consumers receive content rated under two different systems: The MPRS for some content, national ratings for the rest.

As detailed above, development of a thorough descriptive rating language and translation templates for conversion from other rating systems could ease many of the complications of this system. For purposes of this discussion, however, we will assume that such a translation system is not used.

Following this model, parents would configure two sets of filters: one using the international, descriptive categories, the other using domestic ones. The second layer of filtering, using third party red and greenlists, would apply to both domestic and non-domestic content, so long as domestic content was uniquely identifiable by URL or otherwise.

With the increased number of rating systems, carried over various means of content delivery, the technological requirements for filtering would be complicated slightly. The burden of rating for content packagers would also be increased. Those who made foreign material available domestically would have to review content and create new, national ratings (much as many film and television distributors must do now). Those who wished to release domestic material on the Internet would have to create two ratings – one using national categories, the other international descriptive ones.

Evaluative Criteria Analysis:
Multi-Party Rating With Domestic Regulation of Some Content

Role of Key Players:	Content providers or packagers are burdened with redundant rating effort under this system, and users are faced with somewhat more complexity than under most other systems. Third parties continue to play a useful supplemental role. Significantly, the government would play an enforcement role in this model, and thus expedite widespread implementation.
Cost of Implementation (capital and running):	Creation of multiple ratings will introduce some extra costs into the system, as content packagers will have to pay for redundant review and rating of content. Moreover, since the technological underpinnings of this parental control system will have to support two systems, costs could be higher for initial development and production as well as ongoing technical support to customers.
Paid vs. Free Consumption Environment:	No significant differences.
Mapping with Existing Systems:	For domestically unregulated Internet content, this model could map directly with existing rating systems. For domestically regulated television, this system would closely resemble existing systems, although the requirement of bundling ratings information with broadcasts would be new to some countries.
Simplicity for Users:	This system would be somewhat more complex, as it would require use of two incompatible sets of filtering categories.
Flexibility and Internationalisation:	Unless translation were possible, using shared descriptive terminology and translation templates, this system would make the ratings of domestically regulated content inflexible for use in other areas.
Time Scale of Implementation:	Uncertain, depends on technological factors.
Practical Concerns:	The processing power required to handle two ratings systems simultaneously would be somewhat greater then that required for one.

- **Upstream Greenlist Internet Filtering**

If government regulators required adherence to broadcasting standards for all content delivered in a converged environment, content packagers could filter content upstream of customers, using a large greenlist. Viewers would then see only Internet content which met television regulatory standards. Such a greenlist would inevitably also block access to much Internet content, including child-safe material and material of political and social value to adults.

Functional Elements: Upstream Greenlist Internet Filtering

Rating Terminology:	Evaluative
Entity responsible for Rating:	Content Packager
Rating Transmission Method:	No transmission needed, since a single party rates and filters
Implementation of Filters:	Content Packager

Content packagers in a converged media environment could face irreconcilable pressures from Internet-using customers on the one hand, and television regulators on the other. Although most parents prefer individual control to upstream filtering, license-based broadcast regulation has traditionally placed responsibility for "filtering" firmly on the content packager. Simultaneous compliance with both of these pressures may be impossible. Upstream greenlist filtering would allow broadcasters to bring the regulatory standards of television to bear on the vastly different medium of the net.[74] By greenlisting Internet content and broadcasting only content which met regulatory standards, content packagers could bring the converged environment in line with content restrictions of current television.

By taking compliance with broadcast content regulations as a paramount consideration, this approach sacrifices much of what consumers and policy makers value about the Internet. For adult users, upstream filtering could block access not only to entertainment (such as some pornography) legal for adults, but also to political and other content more directly affecting civic participation and free expression. Such strictly curtailed Internet access is unlikely to satisfy customers accustomed to unrestricted Internet access, particularly if it is clear that their machine *could* access the net, if only it were allowed to. Children, too, would be unnecessarily deprived of access to educational and other content by upstream filtering. Such restrictions raise complex policy concerns about civil liberties and civic participation; these concerns might be brought home to broadcasters in the form of customer complaints.

If regulations permitted, a variation on the greenlist model might be to allow adults to bypass the list, using a password. This would largely recreate the conditions under which greenlists operate in the current Internet context, except that parental control would be even more restricted, because there would not be multiple, competing lists to choose from. Other weaknesses of a greenlist approach would map those existing in the Internet context:

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[74] A related approach might follow the lead of current interactive digital television, such as Britain's Open... (Interview with Alice Macandrew, Open, July 2000). This service offers consumers access to a network technologically similar the Internet, but isolated from it. An interactive TV connection leads not to the full Internet, but to a smaller intranet of networked computers (which, like the larger Internet, use TCP/IP protocols to exchange information and facilitate user interaction). These machines, all operated by the access provider or persons in contractual relation to the provider, pose little risk of offensive content. The edited online content available through this system is managed in much the same way as the traditional television programming: government regulations and social norms determine standards of decency, and parents cannot individually filter what content reaches their screen.
The high degree of content packager control which makes this model so safe is also one of its drawbacks. If content packagers hope to create or buy enough quality content (beyond sales and promotional material) to make an intranet appealing to customers, the project could become very costly. This is particularly the case if the packager is effectively competing with free content on the Internet.

- By not putting filtering decisions in the hands of parents, it violates widely expressed consumer preferences.
- The approach is highly inflexible, forcing culturally and ideologically diverse families to accept the same content filters.
- Acknowledged or unacknowledged ideological biases of the list compiler will determine what content is available to customers.
- Most Internet content, whether or not appropriate for children, will be blocked.
- As website content changes over time, only continuous monitoring can prevent greenlist obsolescence.
- Websites of small, non-commercial content providers are likely to be overlooked by greenlist compilers, causing greenlists to "silence" precisely those people for whom the Internet is the only available medium for public expression.

Despite these significant drawbacks, this model seems to be a possible compromise for the converged environment in the short term. It would allow content packagers to comply with television type regulations while offering customers some Internet access. The model may also be an appropriate transitional stage for technological reasons. If the Internet-ready set-top boxes provided to users under this system already had enough processing power to handle local implementation of filters, the switch from upstream filtering to one of the user-end filtering systems described above could be accomplished without any change of hardware.

Evaluative Criteria Analysis: Upstream Greenlist Internet Filtering

Role of Key Players:	The content packager (or subcontractor) who controls content provider inclusion on the greenlist is the critical party in this model.
Cost of Implementation (capital and running):	Licensing of an existing greenlist or development of a new one could both be expensive, with ongoing costs for monitoring and updating. Content packagers would also have to implement upstream filtering devices. As this would draw on existing technology, development costs would be avoided. This model also saves costs over most others by avoiding the development or adaptation of user-end filters and the expansion of metainformation transmission systems.
Paid vs. Free Consumption Environment:	Paid consumption is not a promising option, because the filtered content is not the property of the access provider. If an alternate (and presumably password protected) upstream greenlist gave access to more online *adult* material, users might reasonably object at being charged to bypass filters erected by the access provider in the first place. The owners of the content at issue would not only object but perhaps raise legal challenges to such a practice. If the alternate lists narrowed content to more *child-safe* material, parents and government regulators might object at charging parents to protect their children.
Mapping with Existing Systems:	Since this model treats Internet and television content separately, and draws on existing systems for each, it maps onto prior systems quite well.
Simplicity for Users:	Users would have no role in this system.
Flexibility and Internationalisation:	Although this system is internally inflexible, it is relatively easily adaptable to different markets. Content packagers in each country might wish to tailor details of their Internet greenlists to meet national standards; however, use of a single core list by a broadcaster with international presence seems feasible. Parental control systems for television content would remain unchanged in this model.
Time Scale of Implementation:	This model could be implemented relatively swiftly, since it does not involve development, distribution, and promotion of or education regarding user-end filtering.
Practical Concerns:	This model would require significant processing capacity on the part of

	the access provider, since it would have to check every requested URL against a list of allowed sites.

- **Third Party Greenlists or Redlists for Converged Content**

In this model, third party list makers would issue redlists or greenlists covering all converged content, irrespective of delivery means. This system would require all content to have unique identifiers, like the URL for a website, transmitted directly with the content as bundled metainformation.

Functional Elements: Third Party Greenlists or Redlists for Converged Content

Rating Terminology:	Evaluative or Descriptive
Entity responsible for Rating:	Third Parties
Rating Transmission Method:	Indirect (users download lists)
Implementation of Filters:	User

This approach places the burden and responsibility of filtering content on parents, who would buy lists from commercial or other listmakers. Given such a filtering system, television content in the converged environment would likely continue subject to current content restrictions. Alternately, packagers of television content might be required to freely distribute green- or redlists reflecting regulatory norms, national television ratings criteria, or watershed-based content distinctions for their own programmes.

Technologically, this approach might be relatively easy to develop. Its underlying requirements (unique identifiers directly transmitted with content and a user-end filtering device) may be the same as those for projects, already underway, for advanced EPG searching and sorting or local storage of content.

From the perspective of individual parental control and flexibility, this system shares the same drawbacks as other green- and red-list models previously discussed.

- By not allowing parents to select their own filtering criteria, it violates widely expressed consumer preferences. (Although, the wider the array of lists to choose from, the less significant this concern becomes.)
- Unless a large number of list choices are available, lists will not suit the needs of culturally and ideologically diverse families.
- Acknowledged or unacknowledged ideological biases of the list compiler will determine what content is available to customers.
- Greenlists will block most Internet content, whether or not appropriate for children, while redlists will inevitably fail to block some content inappropriate for children.
- As website content changes over time and in order to avoid obsolescence, greenlist compilers must continuously monitor and parents must continuously update their lists.
- Websites of small, non-commercial content providers are likely to be overlooked by greenlist compilers, causing greenlists to "silence" precisely those people for whom the Internet is the only available medium for public expression.

Evaluative Criteria Analysis:
Third Party Greenlists or Redlists for Converged Content

Role of Key Players:	Commercial third party list compilers are likely to be the most significant source of filtering, though NGOs or government agencies might offer primary or supplemental lists of their own. Content

	providers and packagers would play no role (unless regulation required content packagers to produce lists of their own).
Cost of Implementation (capital and running):	Development and implementation of (1) a system of unique identifiers for non-Internet content and (2) set-top box or set-top browser based user-end filtering systems would be initial hurdles. Technologies developed for other purposes (such as EPG sorting or local content storage), however, may be adaptable for a parental control system, so that independent development costs would be diminished. Since list compilation would be driven by market forces or NGO effort, this aspect of the system would not impose significant costs (unless regulations required television content packager lists).
Paid vs. Free Consumption Environment:	No difference.
Mapping with Existing Systems:	Except for the need to create unique identifiers for non-Internet content, this system builds on existing elements. List compiling businesses and list-based filtering software should be adaptable to the converged environment.
Simplicity for Users:	This is among the simpler systems for users, since they do not need to configure software to implement any independent choices.
Flexibility and Internationalisation:	This model is in theory equally applicable in any market sector or Member State. However, in a market-driven system, it is likely that some cultural and language groups would find plentiful lists to choose from, while others could have few or no choices.
Time Scale of Implementation:	The time scale depends largely on the adaptability of existing technology and technology under development to parental control purposes.
Practical Concerns:	Since these greenlists and redlists would be the sole source of filtering information (and not, as in the MPRS, supplemental to self-labelling), they would probably be huge files. The user's system would need capacity to store these lists and compare each URL request against them.

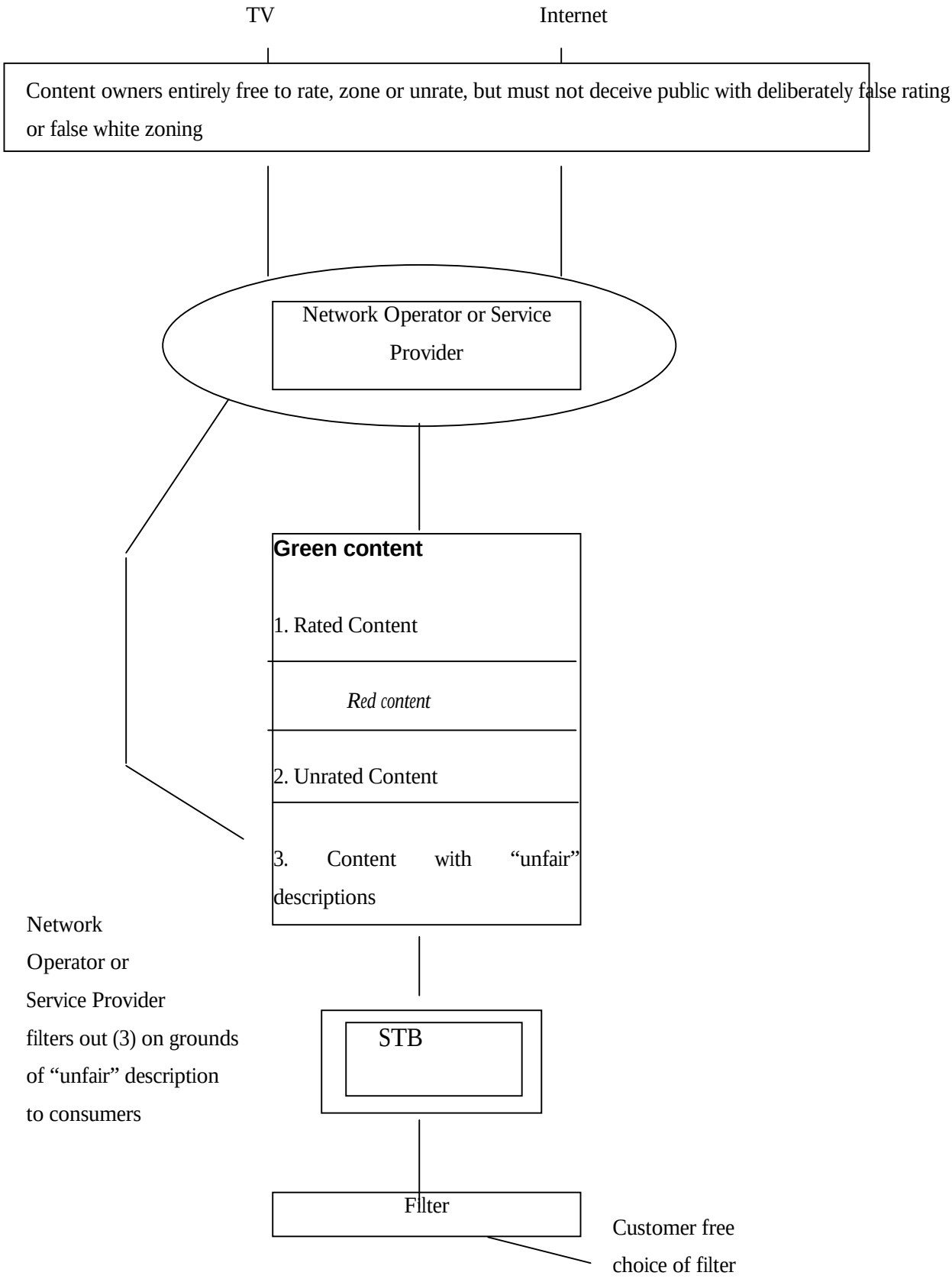
Part V:
Implementation

No recommendations or predictions are satisfactory without a brief note concerning modes of implementation. We see the following pathway to implementation and cooperation towards institutions of self-regulation.

- *Industry initiative* The DVB group is an example of a process of cooperation that will be increasingly characteristic. The Content and Service industry, for all of its uniqueness and differences, will be like other industries that move toward measures of social responsibility, ensuring quality of product to protect the very existence of the market, and some degree of consolidation and negotiation with government. Already, co-operative efforts leading to self-regulation and public assurance are the characteristic of many industry components.
- "*Soft" Government Encouragement on a National and Supra-National basis* It will increasingly be in the interest of government to see intelligent self-regulatory approaches by Content providers. These will be encouraged by what might be called "soft measures." These include: a) public support for self-regulatory measures by key government officials, and, at times, veiled threats of government action in the absence of effective self-regulation; b) financial support for efforts to encourage self-regulation and for institutions that reinforce self-regulatory tendencies; c) incentives for ISPs to display seals of approval or links to walled gardens or other modes of providing advantages for cooperating companies. Effective enforcement of "fair trading" rules or similar measures to assure integrity in labelling can also be considered a soft reinforcement measure. Government can also provide legal support for the infrastructure necessary to achieve self-regulation. This may include tolerance of cooperation among competitors for the purpose of achieving meaningful self-regulation and enforcing standards against those who do not cooperate.
- "*Hard" Pressure from Government* Hard pressure will be in the form, to be avoided to the extent possible, of criminal or civil penalties for failure to rate, coercive measures designed to impede unrated but problematic sites from being retransmitted, government establishment of rating and labelling codes and government enforcement of such codes.
- *Free-Rider and Unregulated and Uncooperative Content Provider Problem* One substantial problem is he "race to the bottom" or possible threats from uncooperative ICPs that do not become part of a self-regulatory program or resist enforcement. Here, too, there is no single answer. The approach lies with the following: providing sufficient "soft" governmental incentives so that the problem of non-inclusion is diminished; use of technological filtering devices that put free-riders or non-cooperators at a substantial disadvantage. Another element will be increased efforts-as in intellectual property or other cross border issues (securities fraud or drug-trafficking) to accelerate cooperation or multilateral governmental approaches. Etc.
- *Institutions of Self Regulation* The very development of institutions of self-regulation will provide an additional buffer. As such institutions grow and develop

credibility, the path toward self-regulation will become easier. That is the record in industries, such as advertising and motion pictures, where there is a long tradition of self-regulation. Some national, some transnational institutions of self-regulation will develop, including institutions that will monitor, assist in defining fair-trading, determine the utility of modes of enforcement, and comment on the standard of performance by national and regional converged self-regulatory entitities.

- *Model* The figure below describes a possible model for making a "fair description" content rating system work in the market place on the basis of an industry led solution.


TV
Internet
Content owners entirely free to rate, zone or unrate, but must not deceive public with deliberately false rating or false white zoning
Network Operator or Service Provider
Green content
1. Rated Content
Red content
2. Unrated Content
3. Content with "unfair" descriptions
Network Operator or Service Provider filters out (3) on grounds of "unfair" description to consumers
STB
Filter
Customer free choice of filter

Part VI:

Summary and Conclusions

Conceptual Template

- The responsibility and power to filter inappropriate content is widely distributed; it lies with a centralized or government agency, with intermediary organisations, or with the consumer.
- As volume and international character of content increases, the very possibility of central control becomes more difficult and the turn to intermediary organisations and consumers accentuates.
- As technological capacity to provide consumers with information about content increases, individual control over filtering becomes easier.
- A filtering system typically requires four elements:
  - Expressive rating terminology
  - A responsible rating entity
  - A means to transmit rating information
  - Implementation of a filter that recognises rating terminology
- It is possible to install filters at several points along the stream of information, but the empowerment of the parent to filter is preferred.

Broadcasting

- Analogue filtering technologies available in Europe are cumbersome, unlikely to become fully operational in all regions within a reasonable period, subject to circumvention, and likely to be rendered obsolete by emerging technologies.
- In contrast, digital technology allows for the operation of technical devices that offer a much higher level of protection, and this especially through Electronic Programme Guides (EPG).
- However, EPG operators currently severely under-use the technical capacity inherent within the digital setting for parental control.
- Rating systems within an EPG environment are derived from or closely related to rating systems established for earlier forms of media (especially cinema specific ratings) and are thus not developed for empowering technical devices. Hence the limited options for customised parental control currently available.
- There is a wide divergence and competition among technological and rating systems used across Europe, yet several developments, as described in this report, such as the development of Multimedia Home Platform (MHP - a common API) and the creation of NICAM (common descriptors across media) may lead to common middleware and metadata descriptors that is more adaptable in a converged media environment.
- During the transition from analogue to digital and even from enhanced to interactive television, traditional broadcasting content control mechanisms will remain important.

Internet

- Current filtering systems which either block webpages containing particular words or rely on lists of particular forbidden and permitted URLs are typically unreliable and over- or under-inclusive in their filtering.
- Proposals for “kids mode browsing” systems which would allow content providers to identify child visitors and make them responsible for blocking access if the site contains child-inappropriate content are impractical under current circumstances.
- The multi-party rating system adopted by the Internet Content Rating Association (ICRA) is the most promising option. It draws on the following elements:
  - A detailed and descriptive labelling language;
  - Self-labelling by content providers, supplemented by third party list-based ratings;

- Embedded labels in HTML documents and separate transmission of third party ratings;
- Highly flexible implementation of filters in the user's browser.

- Some details of the multi-party rating system described in this Report are still under development. The viability of the currently available ICRA model (which uses older RSACi descriptive self-labelling) is limited by the relatively small number of labelled sites; this problem will be a challenge to the new system as well.

Convergence

- This Report assumes that within a converged condition means to transmit metainformation and means for users to sort content based on that metainformation will develop in a platform neutral way to serve general user needs in that environment, and will therefore be available for use in parental control systems.
- Based upon this assumption four models for a converged era are suggested with the following characteristics (This report has a general preference for the first model, while the other models may serve as transitional systems):

	1. Multi-Party Rating System	**2. Multi-Party Rating with Domestic Regulation**	**3. Upstream Greenlist Internet Filtering**	**4. Third Party Green/Redlists for Converged Content**
Role of Key Players:	- Content Producers, Third Parties, and Parents. - Content Packagers expected to play large role.	- Content providers/ packagers burdened with redundant rating. - Government is expediter and enforcer. - Third parties supplementary. - Users faced with more complex system.	Content packager/Subcontractor who controls list critical.	- Commercial third party compilers most important. - NGOs or government agencies may also provide lists.
Cost of Implementation (capital and running):	- Running costs low due to voluntary participation. - Capital costs stem from development of software, technical standard, and rating terminology and conversion of older rating systems.	Multiple ratings will cause higher costs. Two systems will cause higher initial development and production costs.	- Licensing or development of list expensive. - Running costs in monitoring and updating. - Save money with use of available technology for upstream filtering & elimination of need for user-end filters.	- Independent development costs for system of unique indentifiers for non-Internet content and user-end filtering systems depend on ability to adapt available technology. - Running costs low as list compilation depends on market forces.
Paid vs. Free Consumption Environment:	- Little difference. - Exception:	No significant differences.	Paid Consumption not feasible.	No difference.

	paid environment able to encourage accuracy of labels.			
Mapping with Existing Systems:	- Direct for existing Internet systems. - Need adaptation of rating language for television.	- Direct mapping for domestically unregulated Internet. - Close resemblance to existing systems for domestically regulated TV.	Direct	- Builds on existing systems. - Unique identifiers for non-Internet content only exception.
Simplicity for Users:	Templates and set-top boxes make system simple.	Complex	No role for users.	Simple, as users don't need to configure software for independent choice implementation.
International Adaptability and Flexibility:	Flexible.	Ratings of domestically regulated content inflexible.	- Internally inflexible. - Adaptable for different markets.	- Adaptable to any market sector or Member State. - Market forces may cause disparity between groups.
Time Scale of Implementation:	Depends on ability to build on existing technology.	Uncertain.	Swift.	Depends on adaptability of existing technology and technology currently under development.
Practical Concerns:	- Set-top boxes may not be capable of large-scale processing. - Need large amount of self-labeling. -Lacks adequate testing.	Processing power required for two rating systems greater than for one.	Access provider must have significant processing power.	User system must be able to hold huge lists and compare each URL request against them.

APPENDIXES

Appendix 1: Watershed Systems[75]

Country	Watershed rules
Austria	- Before 20.15 programmes must be family-friendly. - Cinema works rated 16+ or more have to be broadcast after 22.00.
Belgium	- Fiction works which due to number of scenes or to their atmosphere are likely to harm sensitivity of minors under 12 must broadcast an icon throughout programme (including credits) for unencrypted channels and for one minute at the beginning of the broadcast for encrypted channels (including credits) when broadcast before 22.00. When broadcast after 22.00 icon to appear for 1 minute at the beginning of the broadcast (including credits) and for 15 seconds after each break. - Works with erotic character or intense violence must broadcast an icon throughout programme (including credits) whatever the broadcasting time (prior to or after 22.00).
Denmark	- An informal watershed of 21.00 is used by the Public Service Television Denmark Radio, and there is also a standard provision for all broadcasters that those programmes which are considered harmful to minors can only be shown after 24.00. - Watershed is not necessary when decoder is used to receive programme.
Finland	- Programmes unsuitable for children must be broadcast after 21.00.
France	- Cinema works rated 12 +, as well as TV works likely to disturb a young audience, notably when they contain systematic or repeated psychological or physical violence, have to be broadcast after 22.00. Broadcast of such work may be possible before 22.00, if icon is displayed throughout. Such exceptions are not permissible on Tuesdays, Fridays, and days preceding non-working days. For encrypted channels broadcasting time is left to the assessment of the broadcaster, however, the enterprise must assure that programmes dedicated to a young audience as well as programmes and trailers broadcast immediately after the said programmes do not contain scenes likely to harm young viewers - Cinema works rated 16 +, as well as TV works with erotic character or intense violence, likely to impair physical, mental or moral growth of minors under 16, have to be broadcast after 22.30. Trailers for these works must not contain scenes likely to harm a young audience's sensitivity and cannot be broadcast before 20.30. For encrypted channels these programmes cannot be broadcast on Wednesday before 20.30, Saturday or Sunday morning. The trailers for works containing violent scenes or scenes likely to harm sensitivity of young audience cannot be broadcast during the unencrypted part of the programming as well as Wednesday before 20.30, or Saturday and Sunday morning.

[75] Parental Control of Television Broadcasting: Oxford University, PCMLP (1999): 100-101.

Germany	- Broadcasts that may endanger the physical, mental, or emotional well-being of children or adolescents may only be transmitted between 23.00 and 06.00. - Films rated '16' can only be broadcast between 22.00 and 06.00 - Films rated '18' can only be broadcast between 23.00 and 06.00. - Exceptions to these time restrictions are also permissible if the broadcaster makes sure by specific means such as encryption that children or adolescents do not have access to the programme. However, this needs to be confirmed by the competent regional regulatory authority on the basis of a proposition for a decision of the Joint Office for the protection of Youth and Programming.
Greece	- Less harmful programmes have to be broadcast after 21.30 - More harmful programmes have to be broadcast after 24.00
Ireland	- Adult viewing may solely be broadcast after 21.00
Italy	- Motion pictures that have been certified by the censorship committees as unsuitable for minors under the age of 14 can be broadcast only within a strict time period: between 22.30 and 7.00.[76] This watershed rule also applies to advertisements of audiotext services such as hot lines, chat lines and one-to-one services.[77]
Luxembourg	- No watershed rules.
Netherlands	- Films which have been rated by the Dutch Board of Film Classification (NFK) in the past and since the 1st of January 2000 by NICAM for an audience over 12 years of age, may not be shown before 20.00 hours - Films which have been classifed '16 and over' may not be broadcast before 22.00 hours.
Portugal	- Violent/shocking content and films classified "16 and over" should be broadcast after 22.00, preceded with a verbal warning and accompanied by a visual symbol throughout the duration of the programme.
Spain	- Broadcasts that may endanger the physical, mental, or emotional development of children may only be broadcast after 22.00
Sweden	- Programmes unsuitable for children must be broadcast after 21.00.
UK	- The terrestrial channel watershed starts at 21.00 and lasts until 05.30. - Cable and licensed satellite services operate with the standard 21.00 watershed for all channels, except for specially encrypted services with restricted availability to children, which have two watersheds: one at 20.00 (equivalent to the 21.00 change on other channels) and the second at 22.00 when material of a more adult nature can be shown. Other cable and licensed satellite services are expected to follow similar standards to the terrestrial channels. - Watershed does not apply in the same way to Pay-Per-View services given their stricter security systems. "18" rated films are allowed at 20.00, "12" and "15" rated films may be shown at any time. Similar arrangements apply to variants, such as (Near) Video on Demand.

[76] Law 223/1990 of 6 August 1990 (the so-called "Mammì Law"), section 13. It has been pointed out by many studies, that the effectiveness of this provision may be frustrated given that children's television viewing time appears to include a good deal of night hours.

[77] Law Decree No. 545 of 23 October 1996 converted into Law No. 650 of 23 December 1996.

Appendix 2: Cinema Rating Bodies in Europe[78]

Country	Body	Nature	Mode
Austria	Jugendfilmkommission Province Advisory Board	State State	Voluntary [79] Voluntary
Belgium	Commission intercommunautaire de contrôle des films	State	mandatory
Denmark	Media Council for Children and Young People	State	mandatory
Finland	Valtion elokuvatarkastamo	State	mandatory
France	Centre National de la Cinématographie	State	mandatory
Germany	Freiwillige Selbstkontrolle der Filmwirtschaft	Industry	voluntary[80]
Greece	Cinematograph Commission	State	mandatory
Ireland	Censor	State	mandatory
Italy	Censorship committee	State	mandatory
Luxembourg	Commission de surveillance	State	mandatory
Netherlands	Nederlandse Filmkeuring/ NICAM	Third-party	voluntary[81]
Portugal	Secretariado do Cinema e do Audiovisual Comissão de Classificação de Espectáculos	State Third-party	mandatory voluntary
Spain	Instituto de Cinematografía y Artes Audiovisuales Communidades Autónomas (Catalonia)	State Regional Authority	mandatory (either one or the other)
Sweden	Statens biografbyrå	State	mandatory
United Kingdom	British Board of Film Classification	Industry	mandatory

[78] Parental Control of Television Broadcasting: Oxford University, PCMLP, 1999 (Updated)
[79] In the absence of a rating, the film may only be shown to children over 16 years.
[80] In the absence of a rating, the film may only be shown to adults.
[81] In the absence of a rating, the film may only be shown to children over 16 years.

Appendix 3: Age Classifications in Europe[82]

Country	1	2	3	4	5	6	7
Austria	All	6+	10+	12+	14+	16+	18+
Belgium	All	16+					
Denmark[83]	All	All, but NR 7-	11+	15+			
Finland	All	16+[84]	18+				
France	All	12+	16+	18+	Complete prohibition		
Germany	All	6+	12+	16+	18+		
Greece							
Ireland	General	Under 12 if PG	12+	15+	18+		
Italy	All	14+	18+	unsuitable for all			
Lux.	All	14+	17+				
Netherlands	All	12+	16+				
Portugal (CCE)	R4+	R6+	R12+	R16+	R18+		
Spain	Specially R for children	For all	NR 7-	NR 13-	NR18-	"X" rated films[85]	
Sweden	All	7+	11+	15+			
UK	'U' (Universal)	PG	12 +	15 +	18 +	Restricted 18[86]	

R = recommended / NR = non recommended

[82] Parental Control of Television Broadcasting: Oxford University, PCMLP, 1999

[83] In accordance with the *Film Act of 12 March 1997*, age classification may be circumvented as it is permitted for children of the age of 7 and above to watch any film in the cinema, as long as the child is accompanied by an adult.

[84] Age categories 6, 8, 10, 12 and 14 may be used. There is also a PG-option "3 years younger may attend if accompanied by a parent (or legal guardian)". The following PG categories are possible: PG-8, PG-10, PG-12. See Finnish Board of Film Classification. Internet WWW page, at URL: http://www.vet.fi (version current at 12 December 1998.)

[85] Pornographic films and films that positively depict violence.

[86] To be supplied only in licensed sex shops to persons of not less than 18 years.

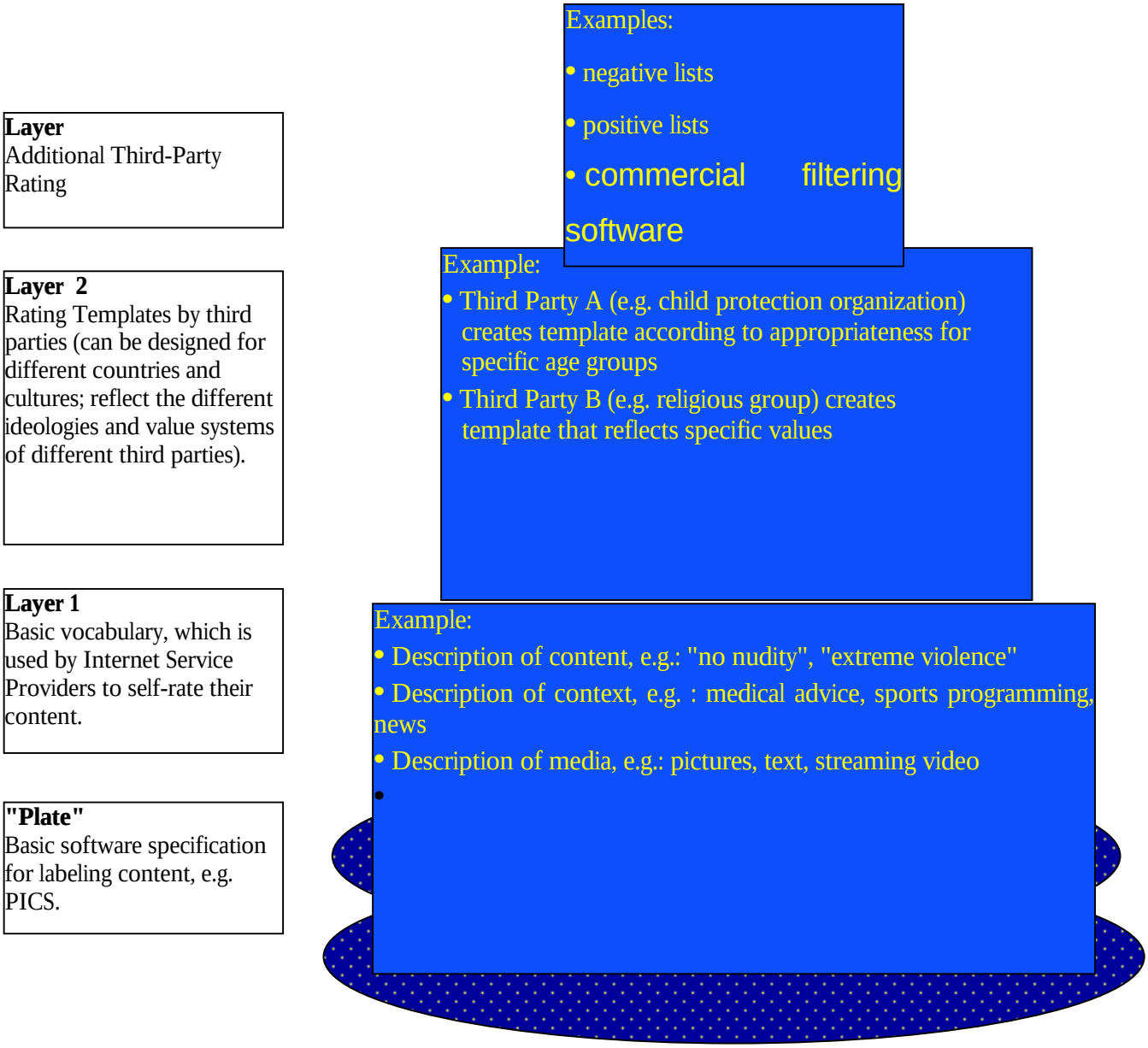
Appendix 4: National Broadcasting Rating Systems in Europe[87]

Country	Body	Process	Mode	Represent-ation	Control
Austria	Broadcasters	TV departments	Mandatory[88] (from 1.1.1999)	W / V	*Kommission zur Wahrung des Rundfunkgesetzes*
Belgium[89]	Broadcasters	Producers / programme dept / channel directors	Mandatory[90]	W / A[91] / V[92] (common)	*CSA, Commissariat voor de Media*
Denmark	Broadcasters	Programme dept	Mandatory[93]	W / A	
Finland	Broadcasters	Internal boards or programming responsible	Mandatory[94] (from 1.1.1999)	W / A / V[95] (common)	Telecommuni-cations Administrative Centre (TV programmes) Consumer Ombudsman (advertisements)
France	CNC (film) Broadcasters	Internal committee	Mandatory[96]	W / V (common)	*Conseil Supérieur de l'Audiovisuel*
Germany	FSF[97] / broadcasters	Compliance officer	Mandatory[98]	W	FSF / *Landesmedienanstalten*
Greece	Broadcasters	Programme dept	Mandatory[99]	W / V(v)[100]	
Ireland	Broadcasters		Voluntary	W / A	Broadcasting Complaints Commission Independent Radio and Television Commission

[87] Parental Control of Television Broadcasting: Oxford University, PCMLP, 1999
[88] Section 2a of the *Bundesgesetz über die Aufgaben und die Einrichtung des Österreichischen Rundfunks* (Broadcasting Act) as amended by *Bundesgesetz, mit dem das Rundfunkgesetz und die Rundfunkgesetz-Novelle 1993 geändert werden* (Federal Act to Amend the Broadcasting Act and the 1993 Amendment to the Broadcasting Act), Federal Law Gazette 1999 I 1.
[89] New system underway.
[90] Decree of 28 April 1998 (Flemish community). The Decree of the French community is still not yet adopted.
[91] Flemish community.
[92] French community.
[93] *Broadcasting Act of 19 February 1998.*
[94] *Act on Television and Radio Operations* , 22 September 1998.
[95] Visual icons are only published in TV magazines and Teletext. The symbol "K" refers to forbidden programs (K stands for *Kielletty*). For Swedish programs, the symbol "F" (*forbjuden*) is used. The symbol is printed after the titles of programmes that have been labelled as unsuitable for children.
[96] Inserted in broadcasters' licence (see, *supra,* note 44).
[97] Competent only for private broadcasters.
[98] *Agreement between the Federal States on Broadcasting in United Germany*, 31 August 1991, last amended on 25 November 1997 (*Rundfunkstaatsvertrag* - RStV).
[99] Law 2328/95 entered into force in August 1995.
[100] As already mentioned, ERT, the Greek public broadcaster, voluntarily implemented a visual system.

Italy	Broadcasters/ Cinema rating body[101]	Internal committee[102] /additional sections[103]	Mandatory[104] / Voluntary (FRT code of conduct)[105]	W/V(v)	*Autorità per le Garanzione nelle Comunicazioni*
Luxembourg	Underway				
Netherlands	NICAM/ Broadcasters		Mandatory[106]	W/A/V(v) (vary)	Commissariat voor de Media
Portugal	SCA (movies) Broadcasters	SCA/programming director	Mandatory[107]	W/A/V (common)	Instituto para a Comunicação Social
Spain	CPCC (movies) Broadcasters	CCPC/ program or channel providers[108]	Mandatory[109]	W/A/V (vary)	
Sweden	Broadcasters	Programme dept	Voluntary	W/A/V[110]	Granskningsn-ämnden for radio and television[111]
United Kingdom	Broadcasters	Compliance officer	Mandatory	W/A(M)/V (v) (vary)	Independent Television Commission

W – Watershed / A – Acoustic warning / V – Visual symbol / (v) – voluntary

[101] Law No. 203 of 30 May 1995 - This is designated for television films and fictional programmes which, given the violent or sexual content, may significantly impair minors. This has not yet entered into force due to the delay in appointing the competent sections to operate within the censorship committee.
[102] Not yet established.
[103] Not yet established.
[104] Law 223/1990 of 6 August 1990.
[105] Adopted on 19 May 1993. Signatories are *Canale Cinque*, *Italia Uno* and *Retequattro.*
[106] *Media Act*, enforced in 1987.
[107] Law 31-A/98, 14 July 1998.
[108] Concerns Satellite Digital Platforms: *Canal Satellite Digital* and *Vía Digital.*
[109] Article 17.2 of Law 25/1994 of 12 July 1994.
[110] TV 1000 has only developed visual symbols.
[111] Swedish Broadcasting Commission.

Appendix 5: Layer Cake Model