In this article, we examine content supply as a public service strategy in Finland, one of the forerunner countries of digital terrestrial television in Europe. Regarding digitalization, European broadcasters face several options from full service to a specialized mission. The case at hand is the first full digital year of 2002 in Finland. The focus is on one of the traditional principles of public service broadcasting, the diversity of programming, as it is realized in the new, digital, multichannel environment. We examine content diversity by comparing channel profiles as well by analyzing indexes of the horizontal and vertical breadth and dissimilarity of programming. In a market of two public service and two commercial analogue generalist TV channels, the five new thematic digital channels have radically altered the amount of system-wide supply, but the diversity of programming has not suffered. This is due to the specializing strategy of the public service broadcaster. Its approach to focus on factual programming is clear in its digital output but can be detected in moderation also in its analogue supply. However, with the expected increase on commercial digital supply also in terrestrial networks, there is the possibility of the generalist public service broadcaster to turn into a fragmented one.
television, at least 10 other European countries are planning to launch it full scale in 2004 to 2005.

In this article, we examine content supply as a public service strategy in Finland as one of the forerunner countries of digital terrestrial television. As universality of contents has conventionally been one of the main ideologies of public service, the focus here is on one of its aspects: on the diversity of programming as realized in the new, digital, multichannel environment.

**Context: European Dilemmas**

Digitalization of television broadcasting in any single European country is a European-wide issue that interests international device manufacturers as well as the EU. The EU stand on digitalization of broadcasting is that the process must be market driven, and the development must abide by EU-level telecom directives regarding technology neutrality, minimum regulation, and transparency (European Commission, 2003). However, one could say paradoxically, as the EU relies on market forces and consumer demand to foster the development, the pan-European strategies and policies for redefining the remit of public service television are nonexistent. Thus, stages and directions of developments vary greatly by country. The future estimate for Europe is that DTV will reach 80 million European households by the end of 2007. Satellite will remain the prominent digital platform, accounting for some 40% of European DTV, but there are high hopes for both cable and terrestrial DTV. The rapid growth of DTV will be experienced especially in the small, multiplatform markets such as Portugal and the Nordic countries. Conversely, the market development will be slower in advanced pay-TV markets such as France, Italy, Spain, and the UK (MINTC, 2003).

Despite the technical and funding dilemmas, the most crucial question for public service television is that of its new mission. Traditionally, for European public broadcasters, diversity is the main defining notion of their remit. It is a principled concept, a normative criterion of quality, and a deliberately sought policy goal aiming at pluralism at various levels: in reflecting the various sectors of society, serving the multiplicity of audiences, and supplying a wide range of choice in program content (Blumler, 1991; Hellman, 2001; McQuail, 1992). In this article, we make a distinction between the broad ideal that is often referred to as the universality principle, with all its dimensions (equal access, minority services, etc.), and one of the more specific performance goals, the diversity of program content or supply. Prior to the multichannel environment, diversity has been viewed as the task of generalist, full-service channels.

Now, in debates of the new era remit, the various aspects of universality are revisited, but the question of the new role of public service goes even beyond them: Digital Strategy Group of the European Broadcasting Union (EBU; 2002) identified as the two main challenges not only defining the kinds of activities that would be identified as the public service remit but also deciding on the kind of institutional framework that should be used for performing the public service role. Both of these questions challenge the ideal of universality in access (broadcasting free of charge and available to all) as well as in content (from a variety of program types to a diversity of “voices” seen and heard in public service channels).

One of the new stances in the matter, much advocated by the commercial competitors, is the call for diversity without public service. Indeed, as Harrison and Woods (2001) pointed out, European public service seems to be in the cross fire of competing concerns: Competition and state aid policies have much higher value than other social and cultural policy concerns, as the former provide legal basis for action. As long as the public service remit is uncertain at the EU level, national public service broadcasters face uncertainty, and the commercial competitors will take advantage of the EU competition policies against them. The liberalist argument claims that the shift to multichannel, on-demand broadcasting offered by digitalization will enable the market to fulfill its public service task with no special broadcasters needed. Two variants of this line of discourse are, in Jakubowicz’s (2003) terms, the “attrition model,” according to which digital development should be left entirely to the commercial sector, and the “distributed public service model” that refers to a situation in which public service programming would be commissioned by regulators from any broadcaster.

Another idea is to provide diversity with a division of labor, something that Hujanen (2004) called “fragmented public service” and Jakubowicz (2003) called the “monastery model.” Here, the logic is that public service broadcasters would fill gaps or concentrate on kinds of programs and services that are not offered by their commercial counterparts. Surely, public service television has already done so to a minor extent in situations in which both public and commercial analogue channels have in principle provided full service with a broad range of genres: The former channels have perhaps chosen more information-oriented profiles and supported some cultural or experimental programming. Today, with the expanding channel capacity, the issue pertains very much to thematic channels.

Despite the just described scenarios for the conventional public service ideal, the approach taken in the forerunner countries of digital terrestrial television is to follow the “full portfolio model” (Jakubowicz, 2003) that in terms of television contents means including both generalist as well as specialized channels in the public service channel palette. When going digital, the British Broad-
casting Corporation (BBC), the German ARD, the Swedish SVT, and the Finnish Broadcasting Company (YLE) have combined the broad mixed-genre channels with thematic or niche channels (Hujanen, 2004).

**Case Study: the Diversity of Finnish Television Supply 2002**

The year 2002 in Finnish television provides an interesting case study on one kind of programming strategy public service broadcasting can follow in the digitalization process. It also addresses the crucial question of whether a digital, multichannel environment supports or challenges content diversity.

**Public Service Broadcasting and the Finnish Television Landscape**

The decade leading Finland to the digital era has witnessed major changes in the television market. Whereas most European countries in the beginning of the 2000s employed by dual systems of public service and commercial broadcasting, in Finland, this has been the case almost from the beginning of television broadcasting. Since 1957, there existed a “comfortable duopoly” (Hellman & Sauri, 1994), as the Mainostelevisio (MTV) sent its own programs as well as advertisements in the two channels of the public service YLE, thus amongst YLE's programming. Finally, in 1993, MTV became MTV3, an independent channel operator, and in 1997, the second nationwide commercial channel Nelonen (“Channel Four”) entered the market. Two public channels competing with two commercial ones equals very moderate competition in an affluent country with 5.2 million inhabitants, especially when compared to the neighboring Sweden with two public and five commercial channels or the Netherlands with three public and no less than eight private channels (Brants & De Bens, 2000). Audience shares show that the public service YLE with its two analogue channels, TV1 and TV2, is still the market leader, reaching a share of 44% on its two channels in 2003. The commercial MTV3 accounts for 38% and the commercial Nelonen 11% (Finnpanel Oy, 2004b).

A new kind of competition, however, has begun digitally. After some postponements, Finland was the sixth country in the world to begin with terrestrial DTV broadcasting in August 2001. The Finnish policies on public service and digital broadcasting can be summarized as on one hand entailing an unambiguous stand on going for terrestrial platform led by the public service YLE. The government’s motives, in short, were to save money in the future with digital broadcasting technology and to compete against foreign digital satellite supply. On the other hand, although developing the platform was a clear-cut decision, the development of demand and content was in practice to be taken care of by market forces (Brown, 2002, 2003). Digitalization was framed as a business activity: For example, there was a definite decision not to subsidize the prices of new transmission devices for the viewers. Instead, it was believed that the increasing choice and “quality of content” would create consumer demand in spite of the extra cost from DTV set-top boxes and rising license fees (e.g., Aslama, 2003). In 2002, the MINTC released its new DTV strategy that reemphasizes the approach taken from the start: The state is to create good operating prerequisites for DTV, but the state is not to bear economic responsibility (Österlund-Karinkanta, 2003).1

As of 2002, the first full year of DTV, a total of nine digital TV channels operated in Finland.

As Table 1 depicts, the digital licenses are divided into two multiplexes, and one separate multiplex is entirely reserved for the public service YLE. Of the five new digital terrestrial TV channels introduced in August 2001, three are operated by YLE; one by Alma Media (Sub-TV), the owner of MTV Finland; and another (Urheilukanava) by Urheilutelevisio Oy. All of them are free of charge, but extra pay-TV services (MTV3+, Nelonen+) as well as entire channels will eventually be part of commercial digital broadcasting.

**Table 1.** Finnish Digital Channels, 2002

<table>
<thead>
<tr>
<th>Multiplex</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator Channels</td>
<td>YLE</td>
<td>MTV3</td>
<td>Nelonen (Channel Four)</td>
</tr>
<tr>
<td></td>
<td>TV1–D: Simulcast of analogue full service</td>
<td>MTV–D: Simulcast of analogue full service with extra programming</td>
<td>Nelonen: Simulcast of analogue full service with extra programming</td>
</tr>
<tr>
<td></td>
<td>TV2–D: Simulcast of analogue full service</td>
<td>Sub-TV: Entertainment-oriented channel for young adults—also on cable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>YLE24: News and current affairs channel</td>
<td>Urheilukanava: Sports channel—also on cable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>YLE Teema: Culture, science, and education-oriented channel</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FST–D: Swedish-language, full service channel</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* YLE = Finnish Broadcasting Company; MTV = Mainostelevisio; FST = Finlands Svenska Television.

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M. Aslama, H. Hellman, and T. Sauri
The digital take-up was marked with economic, financial, and technical difficulties, one of them the nonavailability of multimedia home platform (MHP)-standard digital receivers. As a result, four commercial subscription channels decided not to commence their services, and their licenses, granted in 1999, were eventually withdrawn (Brown, 2003). Nevertheless, the second round of licence applications was completed, and due to new commercial newcomers, the extension of the DTV network concerning the Multiplexes B and C was started in 2004. Also, a fourth multiplex is envisioned, but it will be reserved for data transfer (Österlund-Karinkanta, 2003).

Finnish Diversity Policies

The kind of expansion of channel capacity and content supply described previously could be expected to prompt media policymakers to impose some content performance goals, especially for public service. Traditionally, given the fundamental role of the notion of diversity for public service, some European countries have included specific content requirements, even quotas, in the public service remit. Yet, in Finland, diversity as a performance goal has not been expressed in too much detail either in the Act on YLE of 1993, or the Act on Television and Radio Broadcasting of 1998, which regulates the commercial sector. The 10-year-old law on public service broadcasting simply stipulates YLE to provide a variety of information, opinions, and debates on social issues for the general public as well as for minorities and special groups. As for commercial broadcasters, the law states that when granting licenses, the government should aim at promoting freedom of speech and increasing the diversity of programming.

The preceding depicts that the Finnish policy approach has been to address content diversity implicitly, and the digital era has not brought about any changes. Instead of detailed stipulations of programming, the focus is on the structural approach, that is, on the regulation of the broadcasting market. Diversity is best promoted, the rationale goes, by granting broadcasting licenses to “appropriate” firms only. In other words, if industry structure is kept viable and competition moderate, program diversity follows as a by-product. In the digitalization process, the policy-making has focused on developing the technological infrastructure for terrestrial television, led by the public broadcasting company YLE, and the diversity considerations remained indistinct, being dealt with at the level of market-entry regulation (Aslama, Hellman, & Sauri, 2004; Brown, 2002).

Still, the pressures for public service to justify its existence remain. In 2002, the new Communication Markets Act (MINTC, 2004) was ratified and parallel to that process, stricter demands than before for monitoring the performance of public service were introduced. The requirement is that YLE must produce two annual reports for appraising the universal service duties: one to the Parliament and one to the Finnish Communications Regulatory Authority (which in turn would issue its own statement to the Finnish government). It could be expected that diversity will be one of the core issues to be addressed in those reports, as well as in the assessments of the parliamentary and Ministry working groups that have been set up to redefine the role of YLE in the digital era.

Digitalizing Diversity: Supply of the First Digital Year 2002

One indication of the importance of content diversity to the new era of television is that the MINTC of Finland has since 2001 commissioned studies depicting Finnish television supply. Thus far, the research has covered the years 1997 through 2001 with a specific diversity analysis included. This empirical look at the first digital year of 2002 is based on one of the studies (Aslama & Wallenius, 2003). The data covers altogether 7 sample weeks in 2002, amounting to a total of over 10,500 programs in the four analogue and five digital channels. The data was coded by using a 13-category classification that closely follows the standard typology used by Finnish broadcasters.

An overall look at the programming profiles of the four analogue channels (TV1 and TV2 of YLE and the commercial MTV3 and Nelonen) and the five brand new digital channels (YLE24, YLE Teema and Finlands Svenska Television (FST)–D of YLE, the commercial Sub-TV, and Urheilukanava) reveals a curious result. The five digital channels, of which four are thematically highly specialized, together provide a very similar output to the four analogue full-service channels. Looking at individual channels, they form an interesting continuum in the scale of information and entertainment orientation.

At the outset, the channel profiles featured in Figure 1 seem self-evident. The analogue channels that find their places quite near the center of the information-entertainment axis reflect the generalist tradition. The digital channels, then, exemplify the thematic, fragmented approach that positions public service and commercial channels further apart in the scale. Admittedly, the analogue Nelonen is more entertainment oriented than the digital Sub-TV: This is due to the fact that the former targets a broader audience mainly with Anglo-American fiction, whereas the latter caters to trendy youth and young adults, including a significant proportion of infotainment and factual programs on popular culture. However, three interesting issues emerge from Figure 1. One is the obvious division of labor between all the channels. The analogue channels engage in the division of labor and have increasingly done so since the birth of Nelonen in 1997 (Aslama et al., 2004). The distinction
between analogue and digital channels will eventually vanish when the national switch off of analogue television broadcasting takes place in 2007. Yet, already in 2002, the profiles of the analogue channels catering to the majority of the Finnish viewers have fit nicely together with the profiles of the new digital channels. Another issue is the clear position of public service YLE as the information provider. In fact, since the start of Nelonen, both TV1 and TV2 have reduced the entertainment orientation of their programming. The third point is the question of the digital channel FST–D, which offers all 13 program types and features the most “even” program profile regarding the shares of information and entertainment. In its generalist approach, it is still a specialized channel that serves to justify YLE’s public service operations. A special case in the European context, FST–D provides full-service programming to the Swedish-language minority that forms some 6% of the Finnish population.

The program profiles positioned in the scale of information–entertainment give an overview of the Finnish television system as of 2002 but reveal little of how balanced different channels are, that is, how evenly different program categories are featured in their program profiles. To specifically examine diversity of the first digital year in Finland, two different indexes of program-type diversity are used, one measuring the breadth of programming and the other indicating the difference between the channels. According to Hellman (2001), these measures, called here diversity and dissimilarity, respectively, represent different dimensions of program-type variety.

Breadth is measured by the Relative Entropy Index (H; e.g., Hellman, 2001), which expresses how varied and balanced the program output is on a channel, that is, vertically (channel diversity). When calculated as a summary measure of the overall program output across channels, it serves as a horizontal measure (system diversity). The index varies between 0 (all programming in one category) to 1 (all program types have an equal share in the supply).5 Difference between the channels, then, is measured by the Dissimilarity Index (D), which indicates how much the content of one network in terms of program types represented in its schedule deviates from the content of another (channel dissimilarity). By calculating the average dissimilarity per year, the index serves as a horizontal measure of difference across channels (system dissimilarity). The minimum value for this index is 0 (channels have exactly same kinds of programming profiles), whereas the maximum is 2 (channels utilize completely different program types).6

The channel and system-wide breadth of programming of 2002, featured in Figure 2, prove that diversity as performed by the channel system in the first digital year could be assessed to be beneficial to the viewer. The analogue channel system scores very high for diversity (0.90), but the new digital channels together reach almost the

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**Figure 1.** Profiles of Finnish analogue and digital TV channels (share of informative programming, %), 2002.

Based on the program typology used in this study, informative programming is here defined to include the following categories: news, current affairs, features and documentaries, cultural programs, hobby and 30 personal interest programs, and educational programs. Entertainment programming refers to domestic and foreign fiction, sports, feature films, and entertainment programs. Children’s programs and miscellaneous other programs are not included in these compilation categories. PSB = public service broadcasting; YLE = Finnish Broadcasting Company; FST = Finlands Svenska Television; MTV = Mainostelevisio.
same level (0.88). Through counterprogramming, the digital channels even manage to make an increase—although a marginal one—in the total system-wide diversity (0.91).

As further illustrated by Figure 2, the difference between the diversity provided by commercial and public service is apparent—in total, in analogue, as well as in digital supply.

Admittedly, both YLE as well as its commercial counterparts demonstrate a degree of diversity that is well above average in comparison with the situation in many other countries (e.g., Ishikawa et al., 1996; van der Wurff & van Cuijlenburg, 2001). Yet YLE’s strategy to emphasize information-oriented programming, manifested in moderation by the analogue TV1 and emphasized with the digital YLE24 and YLE Teema, seems to be successful in two ways. First, it remains “inclusive” enough to maintain very high levels of diversity both in analogue and digital supply. Only the news and current affairs channel YLE24 remains below the threshold of high diversity. Also, YLE Teema, thematically focused in education, culture, and science, manages to offer a more balanced mix of program types than the full-service commercial analogue channel Nelonen. Second, as of 2002, YLE’s full-service analogue and thematic digital channels are information oriented enough to act as counterforces to the entertainment-led commercial channels so that system-wide diversity remains very high.

The chosen public service strategy is also illustrated by the analysis of the differences between the channels. Although the digital channels together offer a very diverse array of programs, they also manage to make a positive effect on system dissimilarity due to their specialized and differing profiles: In 2002, the system-wide dissimilarity was notably higher when digital channels were included (1.21) than when measured only with the analogue supply (0.75). The dissimilarity scores also reveal that the five analogue and digital public service channels differ significantly more from one another (1.38) than the four commercial channels from each other (1.07).

This might seem contradictory to the trend in YLE’s strategy emerging from the diversity analysis, the one that could be identified as “moderate specialization.” However, the dissimilarity scores illustrate that the public service channel palette is broader than that of the commercial broadcasters and that the commercial channels compete with “more of the same.” Given that Urheilukanava offers only sport programs (and thus, it differs greatly from all the other channels, increasing the dissimilarity scores notably for the total supply and for the commercial sector), it only underlines the fact that the other three commercial channels offer rather similar, fiction- and entertainment-oriented programming. The public service broadcasters, then, feature three full ser-

![Figure 2. Diversity of Finnish television supply, 2002.](image-url)
vice channels (TV1, TV2, and FST–D) that do not distinguish themselves much from one another but that differ greatly from YLE24 and YLE Teema.

Universality—but How? Public Service Television and Strategies for the Digital Future

The program profiles of Finnish television channels in 2002 as well as the two measurements—of the breadth of programming and of the difference between channels—all support the generalist-meets-the-specialist approach taken by YLE: With this strategy, the Finnish public service television clearly both manages to remain universal in its total program output as well as to counterbalance the commercial output with informative programming at the system level. Obviously, this tactic is not applied because of the virtues of diversity in itself but is justified also on grounds of maintaining the reach and popularity of public service broadcasting. Diversity through “dual strategy” serves as an approach to meet audience demand (Hellman, 1999b).

A good start with digital diversity does not necessarily define the future of YLE’s television. In most public discussions, the traditional public service ethos is forgotten and replaced by criticism targeting the YLE-led digitalization (Aslama, 2003) in response to the numerous problems emerging during the process. To begin with, the launch of digital transmissions had to be postponed by 1 year partly because no MHP reception equipment was in the market for viewers to buy. In addition, the commercial channels were faced with stagnation of advertising revenues coupled with the expected fragmentation of audiences. This prompted the Finnish government, when granting commercial digital licenses, to favor applicants that based their business on pay TV. However, the Finnish pay-TV market has been and still is relatively undeveloped, the receivers were still unavailable by the launch date in 2001, and consequently four new channels had to give up their licenses in the very early stages of their operations (cf. Brown, 2002, 2003).

The Finnish Broadcasting Company, having invested heavily in digitalization, now faces the consequences of the trouble in the commercial sector. In the Communication Markets Act of 2002, the so-called operating license fees paid by commercial analogue broadcasters were halved, and the new digital channels get to broadcast free of charge for the first season of operations. In contrast, the license fee paid by the viewers has been increased to provide additional funding for YLE. The company now operates five channels instead of two with a considerable loss, and according to its own estimates is expected to do so until the last years of this decade.

In respect to demand, the digital markets are small, if growing. At the end of the first digital year 2002, only 1.8% of Finnish households had digital accessory devices; in February 2004, the percentage had already risen to 14% (Finnpanel Oy, 2004a). In spite of new television channels and improved picture quality, digitalization still faces major resistance among audiences. Symptomatically, parallel to the digitalization, the viewers’ satisfaction with the license fee has suffered during the last few years. Jääsaari, Kytömäki, and Ruohomaa (2004) interpreted that this discontent partly is a reaction against licence-fee raises caused by digitalization and partly reflects the general consumer uncertainty about the forthcoming switch off of the analogue service. Although YLE has “most to gain and least to lose from the transition,” as Brown (2003, p. 30) put it, the truth is that in terms of popularity, YLE’s new channels have remained extremely marginal, and it is unlikely that the company would manage to greatly increase its audience share. Rather, YLE24, FST–D, and YLE Teema may further fragment YLE’s traditional viewership and weaken the company’s capacity to invest in content on its main channels TV1 and TV2 (cf. Picard, 2000). This suggests that YLE’s price for expanding its service, increasing the diversity of its supply, and approaching new viewer groups through digitalization is high. The digital channels almost double YLE’s output: In 2002, this meant an additional 22 programming hours per day. Evidently, such expansion of program supply not only costs money but also harms, at least temporarily, YLE’s legitimacy within society.

One of the most obvious and frequent criticisms of YLE’s operations, brought about in political debates throughout the years, is whether there still exists a need for two full-service, Finnish-language channels in the multichannel digital era. YLE has begun to address this early on, as the TV1 and TV2 have gradually become different since the early 1990s (Hellman, 1999a). The goal of differentiation has recently been documented in the “channel commissions” designed by YLE in 2001. According to them, both channels should remain generalist, universal, and full-service channels with TV1, however, serving high quality demands and international orientation and focusing on news and current affairs, documentary, culture, heavy drama, and education; whereas TV2 should provide a more popular approach with its domestic and regional angle, comedy-oriented fiction, lifestyle programs, and entertainment and sports programs (Hujanen, 2002).

In light of the balancing act of generalist and specialist policies by YLE, it could be argued that public service television seems to face three—partly contradictory—demands. First, the question is of diversification system wide. It is clear that YLE does not intend to compete with its commercial competitors with more of the same but aims at filling in the gaps. When new channels enter the digital market, YLE might even have to become more dis-
tinct to correct the “market failure.” Second, public service needs to secure a universal service within the public service channel system. Unsurprisingly, the commercial companies claim that YLE’s remit as a whole should exclude certain program types such as sports and entertainment. Yet the dawn of pay-TV services in the Finnish digital platform requires diversification by public service channels so that diverse programming is offered for free or is only minimally charged. Last, there are still proponents of the idea of a full-service channel to be maintained in the public service remit. A fragmented multichannel strategy, the argument goes, may transform television, the former medium of social cohesion, into a medium of fragmentation that leaves lone consumers to surf in specialized channels (cf. Ellis, 2000). It may very well be that while new, specialized digital channels find their respective audience segments, viewers will still appreciate strong generalist channels that offer them the entire palette of program types. Yet, if TV1 and TV2 continue their division of labor further, a traditional full-service supply provided by each of these channels may soon be history.

Whether and how YLE meets the challenges of its future programming is not decided by YLE alone. To some degree, its prospects depend on the European-wide take on digitalization that, according to Näränen (2003), might be slightly shifting from market orientation to more supportive regulation for public broadcasters. Even more important, the key to the extremely high system-wide diversity of television content has so far, at least in Finland, been the successful market entry policy as realized by the government’s choice of the licensees for commercial analogue broadcasting (Aslama et al., 2004). However, when channel proliferation continues in the digital environment, structural regulation might not suffice. Accordingly, there are signs that certain kinds of public service monopolies are being reestablished, for instance, in the UK and Norway; and some degree of deregulation is underway in most European countries (e.g., Syvertsen & Aslama, in press).

European-wide experience also suggests that the mere act of programming cannot remain as the main strategy of the survival for public service television in the digital era. For example, Born (2003) described the strategic rationales developed by the BBC and Channel Four executives ranging from increasing the revenue streams and branding public service to utilizing digital channels as sites of experimenting for the analogue main channels, building cross-platform and interactive operations, and developing new service for new platforms. It can be suspected that YLE is considering many of the tactics taken up in Britain, although many new revenue strategies would be restricted by law.9

More generally, the Digital Strategy Group of the EBU (EBU, 2002) argued that the traditional idea of universality must at present be seen as a twofold concept. The concept still entails universality of the content but also involves universality across the full portfolio of services, some of them specialized or tailored for specific audiences. A broad understanding of universality has to some extent already been adopted by the Finnish Broadcasting Company and political decision makers: YLE is active in the Internet as well as in mobile services. Besides, to ensure universal access, the Communications Market Act even obliges YLE to provide new services when they are developed in the digital TV environment. As YLE and other European public broadcasters encounter the complex challenges of providing diversity in program content, the universality of services may gain strategic importance for public service television in the digital era.

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Endnotes

1. For a detailed account on Finnish digitalization policies, see Brown (2003).
2. The extension of the DTV network should be completed in Autumn 2004. As of April 1, 2004, the rearrangement of the multiplexes is as follows:
   Multiplex A: TV1–D, TV2–D, FST, YLE24, YLE Teema
   Multiplex B: MTV3, Sub-TV, Nelonen, MTV3+, Nelonen Plus
   Multiplex C: CANAL+, CANAL+ Gold, CANAL+ Blue, Urheilukanava, Viisi
6. The index for dissimilarity is derived by subtracting the percentage devoted to each program category. Relative entropy \( H \) is then obtained by dividing the value of \( H_{abs} \) with the maximum (max) value possible (\( H_{max} = \log_2 N \)), where \( N \) is the number of program categories used:

\[
H = \frac{H_{abs}}{H_{max} = \log_2 N}
\]

3. For a full (unofficial) English translation, see Finnish Broadcasting Company (n.d.).

4. Categorization used here is the following:
1. News
2. Current affairs
3. Information and documentary
4. Cultural programming
5. Personal interest program
6. Sports
7. Domestic fiction
8. Foreign fiction
9. Movie
10. Children’s program
11. Education
12. Entertainment
13. Other programs

The unit of analysis is the individual program, each of which is measured by its length.

5. To calculate the Relative Entropy Index, one needs first to measure the absolute (abs) entropy, \( H_{abs} \), of the program output. This is done according to the following formula:

\[
H_{abs} = \sum p_i \log_2 p_i
\]

where \( p_i \) stands for the percentage devoted to each program category. Relative entropy \( H \) is then obtained by dividing the value of \( H_{abs} \) with the maximum (max) value possible (\( H_{max} = \log_2 N \)), where \( N \) is the number of program categories used:

\[
H_{abs} = \sum p_i \log_2 p_i
\]

The measure has been earlier used in similar studies by, for example, Wakshlag and Adams (1985); Ishikawa et al. (1996); Hillve, Majanen, and Rosengren (1997); van der Wurff and van Cuijlenburg (2001); and Hellman (2001).

Relative entropy \( H \) varies between 0 and 1, with 0 expressing minimum diversity (all content in one category) and 1 expressing maximum diversity (all categories equally large). Due to the logarithmic character of the measure, the closer one comes to the maximum score, the more difficult it becomes to increase its value (Hellman, 2001).

6. The index for dissimilarity is derived by subtracting the percentage of time \( p \) per program category \( i \) by one broadcaster \( A \) (\( p_{Ai} \)) from the corresponding figure by another (\( p_{Bi} \)) and summing up the differences:

\[
D = \sum |p_{Ai} - p_{Bi}|
\]

The higher the sum of differences, the higher the dissimilarity between the channels and vice versa, the lower the dissimilarity index score, the more homogenous the output. The mathematical maximum of this index is 2 and the minimum is 0. In calculating the index, it plays no role whether the result of subtraction is positive or negative; only the extent of deviation matters. This measure has earlier been used by Hellman and Sauri (1994) and Hellman (2001).

7. It is envisioned that the operating license fee will be abolished entirely in 2007.

8. In 2002, the DTV’s transmission area covered 70% of the Finnish households, and by autumn 2004, the coverage is envisioned to be some 90%.

9. A recent addendum on the Act on YLE states that the company may not broadcast television or radio advertising or other content services that are provided in various telecommunications networks, and when offering mobile and other multimedia services, YLE may charge only the amount required by the teleoperator (Finnish Broadcasting Company, n.d.).

References


