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# Curation of a Personalized Video on Demand Service

*A Longitudinal Study of the Danish Public Service Broadcaster DR*

## Abstract

National public service broadcasters are in their programming portfolio very different from global streaming services. Public service is media with a mission, and with some very specific obligations, e.g. to promote national culture. However, departing from the channel-oriented broadcasting heritage public service media are now also becoming popular streaming services. With the Danish public service organization DR as our case, we analyze the tensions in the transition from channels over video on demand to personalized recommendations.

## Keywords

Public service media, curation, TV-channels, video on demand, personalization, Danish media

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## 1 Introduction

An analysis of the use of video on demand (VoD) services in Denmark from September 2019 shows — not surprisingly — that Netflix is the most popular service: 56% of the Danish population use Netflix.<sup>1)</sup> The second most popular VoD service in Denmark is, however, a service run by the oldest Danish public service broadcaster DR. Fifty per cent of the population watch content on DRTV. What is interesting about these numbers is that the two services are run under extremely different conditions: one is global, the other is national. One is commercial, the other is publicly financed. One aims at offering users what they want, the other has obligations to provide a diverse program offer and create coher-

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1) Det danske Filminstitut, *Den Digitale Forbruger 2019: Køb, leje og streaming* (Copenhagen: Det Danske Filminstitut, 2019), accessed December 30, 2020, <https://www.dfi.dk/nyheder/den-digitale-forbruger-2019>.

ence amongst the Danish citizens. And not least: one is very successful in its use of algorithms, the other has just started the process of combining public service scheduling principles with algorithms. In this article we analyze how DR has approached the challenge from Netflix and other global VoD services in the light of public service obligations. By examining DR's video on Demand service DRTV over a period of one year we discuss how streaming strategies and personalized recommendations relate to high-level ideas of public service. We shed light on the practice of PSB online curation, seeing publishing strategies, interface design and algorithmic personalization as new tools for expressing the PSB identity. We base our analysis on quantitative measurements of online program exposure, on in-depth interviews with key PSM staff from DR, on analyses of interfaces, and on studies of policy documents and news articles. The article is structured as follows: First we introduce the notion of public service broadcasting and its core values to provide a backdrop for the analysis of DRTV. Second, we shed light on the transition of the television market from single TV channels over channel portfolios to VoD interfaces. We choose the Danish PSB "DR" as a paradigmatic case to inform a general understanding of the relations between linear scheduling strategies, non-personalized VoD publishing strategies and algorithmic (personalized) recommendation strategies understood as different methods for or way of performing content curation. Finally, we discuss the persistence of the channel concept in a VoD context. We find that flow channel brands to a high degree are present in the VoD interface serving as points of orientation for DRTV's users. The strong presence of particularly one channel brand — DR3 — can partly be explained through the channel's discontinuation as flow channel, partly through DR's desire to strengthen the VoD consumption for the channel's target group. The channel concept is thus well represented in the DRTV VoD despite curation such as thematic rows ("collections") that are not centered around a channel. The page content is only to a little degree personalized. The DRTV VoD is thus more a continuation of DR's flow channel curation strategies than a novel type of curation.

## 2 Background

Private and public service broadcasters share many of the problems related to the transition to Video on Demand (VoD) and personalization, but public service broadcasters have special obligations that make them particularly interesting as an object for study. One important distinguishing element of public service broadcasting (PSB) is that both the content production, the journalistic approach and the scheduling / publishing strategies not alone are defined by what is popular among users and audiences, but also by programming obligations defined in contracts with media regulators. These contracts etc. stress the promotion of specific content and / or types of content both in the production and in the broadcast scheduling. The exact obligations vary from country to country and among PSB organizations, but the central observation is that the content exposure is shaped and influenced by these obligations. The obligations have historically influenced the scheduling of programming on broadcast as well the portfolios and identities of TV channels. It could be assumed that these obligations also are expressed in the design and curation of online

PSM services such as Video on Demand services, but this question is under-researched. Also the question of how the obligations are reflected in the PSB / PSM use of algorithmic recommendations is under-researched. This article attempts to address these under-researched questions.

The above-mentioned obligations are rooted in the history of PSB having monopoly on radio and TV in North European countries, and in the close affiliation of broadcast organizations with the respective nation states. PSB was from the beginning conceived as a media political instrument to promote certain values, societal cohesion, and enlightenment. Central programming values from the early days of broadcasting are thus still central to the concepts of PSB and PSM. The first director general of the BBC, John Reith is often referred as the source<sup>2)</sup> of the public service mission — to Inform, Educate, and Entertain — although the US-based inventor of broadcasting, David Sarnoff, already in 1922 expressed similar ideas.<sup>3)</sup> The public service values are typically rooted in an understanding of societies as deliberative or participatory consensus-seeking democracies and based on the independence of the public service organizations.<sup>4)</sup> As formulated by former director general at the Danish PSB DR, Christian Nissen: “Influencing the listener’s and viewer’s choices, and thus media consumption pattern is the very reason why public media were established and why their existence has been upheld even in times of abundant media supply.”<sup>5)</sup> Public service media are thus value-driven. The core obligations have remained until today despite technical and media political developments.

Despite the existence of public service broadcasting (PSB) for nearly a hundred years, neither the notion of PSB nor its platform neutral successor “public service media” (PSM) is clear. Academia has dealt with the concept for several decades and the research field covers many aspects: While some scholars, e.g. Garnham, Scannell, Murdock, and Tracey<sup>6)</sup> have defended the public service organizations’ importance to society, others such as Jakubowicz, Donders, Graham et al., and Doyle<sup>7)</sup> have paid attention to how these media

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- 2) John C. W. Reith, *Broadcast Over Britain* (London: Hodder and Stoughton, 1924).
  - 3) Asa Briggs, *The BBC — The First Fifty Years* (Oxford and New York: Oxford University Press, 1985).
  - 4) UNESCO, “Public Broadcasting Why? How?” (Paris: UNESCO, 2001), accessed May 18, 2021, <http://unesdoc.unesco.org/images/0012/001240/124058eo.pdf>.
  - 5) Christian S. Nissen, “No Public Service without Both Public and Service — Content Provision between the Scylla of Populism and the Charybdis of Elitism,” in *Making a Difference: Public Service Broadcasting in the European Media Landscape*, ed. Christian S. Nissen (Eastleigh: John Libbey Publishing, 2006), 69.
  - 6) Nicholas Garnham, “The Media and the Public Sphere,” in *Communicating Politics: Mass Communications and the Political Process*, eds. Peter Golding, Graham Murdock, and Philip Schlesinger (New York: Holmes & Meier, 1987), 37–55; Paddy Scannell, “Public Service Broadcasting and Modern Public Life,” *Media, Culture & Society* 11, no. 2 (1989), 135–166, <https://doi.org/10.1177/016344389011002002>; Graham Murdock, “Medier, Offentlighed og Marked: Kommunikation og Politisk Myndiggørelse i Kapitalistiske Demokratier,” *Mediekultur: Journal of Media and Communication Research* 6, no. 13 (June 1990), 21, <https://doi.org/10.7146/mediekultur.v6i13.875>; Michael Tracey, *The Decline and Fall of Public Service Broadcasting* (New York: Oxford University Press, 1998).
  - 7) Karol Jakubowicz, “Bringing Public Service to Account,” in *Broadcasting & Convergence: New Articulations of the Public Service Remit*, eds. Gregory Ferrell Lowe and Taisto Hujanen (Göteborg: Nordicom, Göteborg Universitet, 2003), 147–165; Karen Donders, “State Aid and Public Service Broadcasting,” in *Rethinking European Media and Communications Policy*, eds. Caroline Pauwels, Harri Kalimo, Karen Donders, and Ben Van Rompuy (Brussels: VUB Press, 2009), 187–216; Andrew Graham, Christian Koboldt, Sarah Hogg, Bill Robinson, David Currie, Martin Siner, Graham Mather, Julian Le Grand, Bill New, and Ian Corfield, *Public*

are regulated and politically controlled. Others again e.g. Ytreberg, Lowe, Enli, and Ihlebæk, Syvertsen, & Ytreberg<sup>8)</sup> have studied the PSM from an institutionalized perspective, focusing — among other perspectives — on the scheduling of the range of programs and the relation to the audiences. Finally, within the last decades, a wide range of literature has paid attention to the transition from PSB to PSM, that is what happens to the notion and practices of the public institutions as the media become digital.<sup>9)</sup>

Certain aspects however remain important despite the transformations of the institutions from PSB to PSM and the scholarly discussions. One is the obligation to provide a diverse and versatile program offer, and that (political) communication must be impartial. Another core value is the emphasis on the national culture, language, and identity. Van den Bulck describes how PSB became an important part of nation building in the middle of the 20th century.<sup>10)</sup> Today the national public service organizations often verbalize themselves or are verbalized by others as crucial counterpoises to global media, not least regarding children's content. The final important characteristic, we would like to highlight in this context, also originates from the very founding of broadcasting, namely the idea of universality.

When the radio and television stations were established, a crucial matter was to make sure that the services were available nationwide.<sup>11)</sup> This was achieved via a network of powerful relayed radio transmitters. However, as the distribution technology, competition and media market have changed, the interpretation of universalism has developed.<sup>12)</sup> Universality is no longer only a matter of making sure the entire population can access the PSB content. Van den Bulck and Moe instead focus on universality as content: both in the sense of a universal appeal and as: “[...] the idea that PSM must cater to every specific taste, even outside the mainstream.”<sup>13)</sup> This is not something new: It has traditionally been

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*Purposes in Broadcasting: Funding the BBC* (Luton: University of Luton Press, 1999); Gillian Doyle, *Understanding Media Economics* (London and Thousand Oaks and New Delhi: Sage Publications Inc, 2013).

- 8) Espen Ytreberg, “Continuity in Environments: The Evolution of Basic Practices and Dilemmas in Nordic Television Scheduling,” *European Journal of Communication* 17, no. 3 (September 2002), 283–304, <https://doi.org/10.1177/0267323102017003687>; Gregory Ferrell Lowe, ed., *The Public in Public Service Media* (Göteborg: Nordicom, Göteborg Universitet, 2010); Gunn Sara Enli, “Defending Nordic Children against Disney: PBS Children’s Channels in the Age of Globalization,” *Nordicom Review* 34, no. 1 (2013), 77–90; Karoline Andrea Ihlebæk, Trine Syvertsen, and Espen Ytreberg, “Keeping Them and Moving Them,” *Television & New Media* 15, no. 5 (2014), 470–486, <https://doi.org/10.1177/1527476413479676>.
- 9) Benedetta Brevini, “Under Siege by Commercial Interests? BBC and DR Online between the National and European Policy Frameworks,” *Interactions: Studies in Communication & Culture* 1, no. 2 (2009), 203–215, [https://doi.org/10.1386/isc.1.2.203\\_1](https://doi.org/10.1386/isc.1.2.203_1); Karen Arriaza Ibarra, Eva Nowak, and Raymond Kuhn, eds., *Public Service Media in Europe: A Comparative Approach* (Abingdon and New York: Routledge, 2015); Michal Glowacki, and Alicja Jaskiernia, *Public Service Media Renewal: Adaptation to Digital Network Challenges*. (Frankfurt a.M.: Peter Lang GmbH, Internationaler Verlag der Wissenschaften, 2018); Gregory Ferrell Lowe, Hilde Van den Bulck, and Karen Donders, *Public Service Media in the Networked Society: RIPE@2017* (Göteborg: Nordicom, Göteborg Universitet, 2018).
- 10) Hilde Van den Bulck, “Public Service Television and National Identity as a Project of Modernity: The Example of Flemish Television,” *Media, Culture & Society* 23, no. 1 (2001), 53–69, <https://doi.org/10.1177/016344301023001003>.
- 11) Trine Syvertsen, “The Many Uses of the ‘Public Service’ Concept,” *Nordicom Review* 20, no. 1 (1999), 6.
- 12) Jannick Kirk Sørensen, “Personalised Universalism in the Age of Algorithms,” in *Universalism in Public Service Media: RIPE@2019* (Göteborg: Nordicom, Göteborg Universitet, 2020), 191–205.
- 13) Hilde Van den Bulck, and Hallvard Moe, “Public Service Media, Universality and Personalisation through

an obligation that the PSB organizations cater to minorities. It is, however, interesting to see how universality now can be interpreted in two somehow contradictory ways: as a matter of addressing the entire population and as serving the niche audiences as well. This development points to the fact that the notion of public service is transmutable and resilient, which is a part of the explanation why these media institutions still hold a strong position 100 years after their foundation. The understanding of universality, the idea of a diverse and versatile program offer must now be put into practice under very different technological conditions than when the broadcasters were given their initial mission. Following this, it is also relevant to shortly address the development of the notion itself: From the middle of the 2000s it became widespread in academia to use the term “*public service media*” instead of “*public service broadcasting*”. The point of this transition was to emphasize the platform neutrality of the public service activities. In the next section we will elaborate on one aspect of this transition: the development of television from being programs distributed on a single channel to being content available in an online catalogue.

## 2.1 From Single TV Channels to Portfolios and VoD Interfaces

The concept of “channels” has a long and strong tradition, rooted in the physical properties of radio waves. Ellis<sup>14)</sup> and Johnson<sup>15)</sup> characterize the so-called broadcast era — roughly from the 1930s to the 1980s — by a scarcity of channels. A consequence of the limited number of channels was that the national governments in several western countries decided to distribute the few frequencies amongst broadcasters, military, and telecommunication.<sup>16)</sup> As a consequence of the broadcast monopoly, universal geographical coverage of the radio waves was made a policy goal or an obligation. The single or very few available channels meant that in the broadcast era, the channel was “just” a means to distribute programs. However, with cable and satellite and new frequency bands, as well as the liberalization of the TV market in the 1980s and 1990s, the number of TV channels grew, and the role of the channel changed.

The programming policies of PSM have at all days attracted great attention. These policies not only represent the voice of the nation and of authorities, but also have to meet audience interests and expectations. Thus, Bruun<sup>17)</sup> characterizes the schedule as a core genre of television. In the early days of broadcasting typically only a single national channel was offered to the audience. The single channel structure implied — and ensured — that every listener received the same message, and the selection and composition of the program schedule was an efficient way of collective agenda-setting. The single channel offered not only a continuity of shared programs, but also created a collective rhythm of the day

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Algorithms: Mapping Strategies and Exploring Dilemmas,” *Media, Culture & Society* 40, no. 6 (September 2018), 878, <https://doi.org/10.1177/0163443717734407>.

14) John Ellis, *Seeing Things: Television in the Age of Uncertainty* (London and New York: I.B. Tauris, 2002).

15) Catherine Johnson, “The Authorial Function of the Television Channel: Augmentation and Identity,” in *A Companion to Media Authorship*, eds. Jonathan Gray, and Derek Johnson (Wiley Online Library, 2013), 275–295.

16) Tom Lewis, *Empire of Air: The Men Who Made Radio* (NY: Edward Burlingame Books, 1991).

17) Hanne Bruun, *Re-Scheduling Television in the Digital Era*. 1st ed. Routledge Focus on Television Studies (London and New York: Routledge, 2020), <https://doi.org/10.4324/9780429276309>.

and year, synchronizing the society.<sup>18</sup> However, urged by listeners, the BBC and later other public service radios already after World War II launched more radio channels to accommodate for different tastes in music.<sup>19</sup> The BBC Light Programme from 1945 is thus the first example of segmented programming. The introduction of a multi-channel system ended the broadcast's initial close connection between the technical universality obtained by the ubiquitous coverage of radio waves and universality in programming obtained by a single channel. The PSB institution was not any longer only speaking with one voice. In a metaphorical sense, broadcasting ceased to exist with the multi-channel system.<sup>20</sup>

Johnson<sup>21</sup>) and Light<sup>22</sup>) describe how the increased competition between the broadcasters and the single channels made it necessary for the television companies to make their channels stand out with clear and distinguishable profiles, addressing a specific audience. According to Johnson the viewers kept to approximately 5–8 channels in spite of the amount of channels to choose between.<sup>23</sup>) Thus it became “[...] increasingly important not only for broadcasters to stand out in an ever more crowded marketplace, but also to try to position themselves as one of the few regular channels for television viewing.”<sup>24</sup>) A distinct profile became an important instrument in the struggle between the channels to be one of the selected few of the viewers' choice.

Also, PSM organizations launched new targeted channels in the '90s and '00s.<sup>25</sup>) Often the portfolios consisted of a number of narrowly profiled channels along a popular main channel.<sup>26</sup>) With the multi-channel portfolios the PSM programming policy shifted from catering for diversity in the programming of one single channel to addressing diversity via a portfolio of channels each with a specific focus. Thus, the schedulers on the public service television channels had the important and challenging task to strike the balance between two somewhat conflicting missions. On the one hand it was (and is!) in the broadcasters' interest to retain the viewers on the channel/within the channel portfolio, while on the other hand encouraging a consumption of a diverse range of programs that met all of the public service obligations.<sup>27</sup>)

18) Sylviane Agacinski, *Time Passing: Modernity and Nostalgia* (Columbia University Press, 2003); Paddy Scannell, “The Meaning of Broadcasting in the Digital Era,” in *Cultural Dilemmas in Public Service Broadcasting: RIPE@2005*, ed. Per Jauert (Göteborg: Nordicom, Göteborg Universitet, 2005), 129–142.

19) Paddy Scannell, “Public Service Broadcasting and Modern Public Life,” *Media, Culture & Society* 11, no. 2 (1989), 135–166, <https://doi.org/10.1177/016344389011002002>.

20) Julie Mejse Münter Lassen, “DRs Tv-Virksomhed i Forandring: Programflade, Portefølje og Platforme” (Unpublished PhD dissertation, Copenhagen: Copenhagen University, 2018), accessed May 18, 2021 [https://static-curis.ku.dk/portal/files/209265845/Ph.d.\\_afhandling\\_2018\\_Lassen.pdf](https://static-curis.ku.dk/portal/files/209265845/Ph.d._afhandling_2018_Lassen.pdf); Julie Münter Lassen, “Multi-channel Strategy, Universalism, and the Challenge of Audience Fragmentation,” in *Universalism in Public Service Media: RIPE@2019*, eds. Mercedes Medina, Philip Savage, and Gregory Ferrell Lowe (Gothenburg: Nordicom, Göteborg Universitet, 2020).

21) Johnson, “The Authorial Function of the Television Channel”.

22) Julie J. Light, “Television Channel Identity: The Role of Channels in the Delivery of Public Service Television in Britain, 1996–2002” (Unpublished PhD thesis, Glasgow: University of Glasgow, 2004).

23) Catherine Johnson, *Branding Television* (London: Routledge, 2012), 85.

24) Johnson, “The Authorial Function of the Television Channel,” 283.

25) Jeanette Steemers, “Public Service Broadcasting Is Not Dead Yet: Strategies in the 21st Century,” in *Broadcasting & Convergence: New Articulations of the Public Service Remit*, eds. Gregory Ferrell Lowe, and Taisto Hujanen (Kungälv: Nordicom, Göteborg Universitet, 2003), 123–137.

26) Lassen, “Multichannel Strategy”.

27) Ytreberg, “Continuity in Environments”.

## 2.2 “The Scylla of Populism and the Charybdis of Elitism”

In the few-channel-environment, before private TV broadcasting was allowed in North Europe, the different broadcast programming types (e.g. news, religious programs, music) were produced in specialized PSB departments each responsible for one or several slots in the broadcasting schedule. With the introduction of the “dual system” with private TV-channels, public service broadcasters were forced to re-think the scheduling strategies and dissolve the legendary “department-slot” scheduling principle.<sup>28)</sup> Furthermore, PSB organizations had to formulate in a more specific manner the public service element of their programming. If this was too little distinctive, the accusation of unfair license-financed competition was raised by private broadcasters. Conversely, if too many viewers abandoned the PSB channel, the very legitimacy of the institution and the license-fee would disappear. In the multi-channel TV era, according to Nissen,<sup>29)</sup> PSB organizations thus balanced between being too popular and too distinctive.<sup>30)</sup> Above-mentioned Nissen extrapolated this logic into a VoD future arguing that also PSM in the content provision would have to navigate between “the Scylla of populism and the Charybdis of elitism.”<sup>31)</sup> As discussed by Sørensen<sup>32)</sup> the personalized exposure of PSB content could ease the navigation, but would at the same time challenge central PSB concepts such as “universalism” and “diversity”. In a fully personalized interface, every user would be presented to different PSM content, possibly lacking a shared curation.

## 2.3 Video on Demand services

The video on demand (VoD) platforms that emerged during the 2000s and 2010s challenged the classic channel portfolio concept as both public and private media organizations started to offer their content on new platforms. Furthermore, from around 2010 broadcasters faced additional competition as international streaming services like Netflix, Amazon Prime and HBO were introduced in countries outside the United States. This movement has undoubtedly accelerated the integration of VoD services in the PSM activities.

Television on-demand differs from linear television to a degree that even though the content might be more or less identical, distribution, arrangement, and reception are basically different between the two platforms. In three ways on-demand TV is different from its predecessor, broadcast TV: The catalogue structure, interactivity, and the fact that internet-distributed television “[...] does not require time-specific viewing” as Lotz puts it.<sup>33)</sup> Through a database or catalogue the viewer search and choose content themselves in-

28) Henrik Søndergaard, *DR i Tv-Konkurrencens Tidsalder* (København: Samfundslitteratur, 1994).

29) Nissen, “No public service.”

30) Ibid.

31) Ibid.

32) J. K. Sørensen, “PSB Goes Personal: The Failure of Personalised PSB Web Pages,” *MedieKultur* 29, no. 55 (2013), 43–71; J. K. Sørensen, “The Paradox of Personalisation: Public Service Broadcasters’ Approaches to Media Personalisation Technologies,” (Unpublished PhD dissertation, University of Southern Denmark, 2011).

33) Amanda D. Lotz, *Portals: A Treatise on Internet-Distributed Television* (Ann Arbor: Michigan Publishing, University of Michigan Library, 2017), 15, accessed May 18, 2021, <http://hdl.handle.net/2027/spo.mpub.9699689>.

stead of viewing a flow of programs structured by schedulers. The number of programs on a linear channel is limited by a timeframe: A linear channel can only broadcast 24 hours per day. This does not apply for an online database: Capacity is no longer a matter of broadcast hours. However, this entails other kinds of challenges. As Webster describes, the online catalogues tend to be most comprehensive, to a degree that the user lose track of things.<sup>34)</sup> Therefore, he argues, recommendation systems and personalization become necessary.

Recommendations and personalization also become important in the fierce competition about the users' attention among the tech and media companies. According to Tryon, "[...] subscription video-on-demand (SVoD) services, such as Netflix, have 'packaged' the television text through streaming archives that encourage users to watch episodes consecutively, especially through sustained periods of watching successive episodes, a practice that has popularly become known as 'binge watching'."<sup>35)</sup> While bingeing traditionally is a word used to describe a kind of excessive or unrestrained behavior, according to Tryon, "Netflix, through its practice of releasing an entire season's worth of episodes simultaneously, seeks to emulate this experience of liveness, in part by promoting the idea that viewers will be left out if they don't watch new seasons as soon as they are available. Netflix in particular works to promote the idea that streaming series simultaneously could revitalize this shared sense of collectivity through its validation of the instant mode."<sup>36)</sup>

In the competition with the binge-strategy of Netflix and similar players, the PSM face a difficult challenge: on the one hand they wish — and need to appear attractive to the users. Otherwise, they lose their importance to the society. On the other hand, they must stand out as an alternative to the commercial services, adhering to their original task of offering a diverse and versatile program offer, and supporting the national language, culture, and identity.

### 3 Research question

This article examines, through a case study of the Danish PSM "DR", public service media organizations' dilemma between optimizing their VoD services to match the streaming competition and at the same time maintaining strong channel portfolios and identities. The questions are: 1) What is the relation between channels, VoD interface and content? 2) To which extent are channel brands directly or indirectly present in the VoD interface? By studying the curation strategies for VoD interfaces, this article sheds light on public service broadcasters' transformation to public service media organization.

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34) James G. Webster, *Marketplace of Attention — How Audiences Take Shape in a Digital Age* (The MIT Press, 2016), 70–73.

35) Chuck Tryon, "TV Got Better: Netflix's Original Programming Strategies and the on-Demand Television Transition," *Media Industries Journal* 2, no. 2 (2015), 106.

36) *Ibid.*, 107.



### 3.1 Approach

We approach the analysis of the DRTV VoD and DR's flow TV with the concept of "curation". Hereby we signify the (human) selection that makes TV content (programs) visible for viewers and users in an interface. Since 2017 DR has used the term "curation" to describe the editorial arrangement of the DRTV landing page.<sup>37)</sup> Before this, several scholars have connected the notion of curation with the television companies' streaming services and how these are structured.<sup>38)</sup> The notion of curation originates from the field of art history. Thus, Graham and Cook define the task of the curator as "caring for objects" and add that the curator is basically: "[...] acting as a kind of interface between artist, institution, and audience [...]"<sup>39)</sup> The reason why it is an advantage for a public service media institution such as DR to verbalize its online activities as a matter of curation is that curation is platform-neutral. By describing its role as the one of a curator, DR is emphasizing its experience and expertise in selecting and presenting programs independent of the platform. In the VoD service the curation of the programs is expressed e.g. by the placement of content at the page; top or bottom — within or outside the visible part of the browser window; by labels, headlines, categories, "collections" and other text descriptions of the content; and visual emphasis of it via background color etc. We borrow our approach to the analysis of VoD interfaces from Kelly (forthcoming)<sup>40)</sup> emphasizing the designed and scripted nature of the interface.<sup>41)</sup>

## 4 Method

As case study, the Danish PSM "DR" has been chosen as a paradigmatic case<sup>42)</sup> based on DR's strong position in the relatively small Danish media market characterized both by globalization and by the prominence of national culture and language programming policy. Even though Denmark is a small country — measured on both population and language wise — DR is an important player internationally. First, DR is famous for its drama

37) DR, *Redegørelse vedr. befolkningens brug af on demand samt erfaringerne med DRs tilrådighedsstillelse af tv-programmer on demand* (June 2017). Copenhagen, accessed December 16, 2020, [https://www.dr.dk/static/documents/2017/06/14/redegoerelse\\_om\\_dr\\_tv\\_aa65a3b7.pdf](https://www.dr.dk/static/documents/2017/06/14/redegoerelse_om_dr_tv_aa65a3b7.pdf); Lassen, "Multichannel Strategy," 146.

38) Johnson, "The Authorial Function of the Television Channel"; Inge Ejbye Sørensen, "Channels as Content Curators: Multiplatform Strategies for Documentary Film and Factual Content in British Public Service Broadcasting," *European Journal of Communication* 29, no. 1 (2014), 34–49; Gillian Doyle, "Resistance of Channels: Television Distribution in the Multiplatform Era," *Telematics and Informatics* 33, no. 2 (2016), 693–702.

39) Beryl Graham, Sarah Cook, and Steve Dietz, *Rethinking Curating Art after New Media* (Cambridge, Mass and London, England: The MIT Press, 2010), 10.

40) J. P. Kelly, "'Recommended for you': A Distant Reading of BBC iPlayer," *Critical Studies in Television: The International Journal of Television Studies*, forthcoming.

41) Daniel Chamberlain, "Scripted Spaces: Television Interfaces and the Non-Places of Asynchronous Entertainment," in *Television as Digital Media*, eds. James Bennett, and Niki Strange (Durham: Duke University Press, 2011), 230–254.

42) Bent Flyvbjerg, "Five Misunderstandings About Case-Study Research," *Qualitative Inquiry* 12, no. 2 (April 2006), 219–245, <https://doi.org/10.1177/1077800405284363>.

series, which have won several international prizes and have been sold in several countries all over the world. Second, and more relevant in this context, DR is a part of a very strong tradition of PSM in the Nordic countries.<sup>43)</sup> The Nordic PSM organizations are characterized by a (historic) noticeable level of support from the public as well as politicians.<sup>44)</sup> They have for years attracted attention from other parts of the world.

The research questions are addressed both via quantitative and qualitative data related to the case study. Via a longitudinal registration over 337 days of program content presented at the web front page of DRTV's VoD service<sup>45)</sup> publishing trends can be characterized quantitatively. The website has been accessed and documented on a daily basis from March 1, 2019 to March 1, 2020, however with a few days missing due to technical problems. The VoD service is also available on other platforms such as smart phones, tablets and smart TV but we limit our analysis to the web browser interface of DRTV. The headlines and program titles of the site, as well as the position of the content at the page, has been stored in a database to facilitate the analysis. Qualitatively the article is informed by in-depth interviews with Head of Scheduling at DRTV Henrik Birck, with Head of the DR personalization project Jakob Faarvang, with then Head of DR Media Gitte Rabøl, with digital editor of DRTV Christian Boye-Roed, and with staff directly involved with the personalization of DRTV: Product Owner/DataOps Ulrik Dornonville de la Cour; Specialist in Optimisation and Personalisation Søren Gjelstrup Jessen and UX designer Mads Nilsson.

## 5 Case study: DR

Founded in 1925 as *Statsradiofonien* (the State Broadcaster), “Danish Broadcasting Corporation”) — short DR — was, until mid 1980s, the only national radio and TV station in Denmark, a country of approximately five million Danish-speaking inhabitants. The monopoly lasted until 1983 where local community radio was initiated as a democratization project. In 1988 a second TV-channel, TV 2, was launched as a result of a political desire to “break” DR's monopoly on TV.<sup>46)</sup> Facing the competition, the launch of TV 2 caused fundamental changes in DR both to the commissioning, production and scheduling of TV programs.<sup>47)</sup> Despite the many new competitors that also entered the market the following years, DR's TV channels have however obtained a weekly reach of 71,6% and a share of 35,5% in total in 2019.<sup>48)</sup>

43) Trine Syvertsen, *The Media Welfare State: Nordic Media in the Digital Era* (Ann Arbor [Michigan]: The University of Michigan Press, 2014); Daniel Hallin, and Paolo Mancini, *Comparing Media Systems: Three Models of Media and Politics* (Cambridge: Cambridge University Press, 2004).

44) Cf. Benedetta Brevini, *Public Service Broadcasting Online: A Comparative European Policy Study of PSB 2.0* (London: Palgrave Macmillan, 2013); Christian S. Nissen, “Introduction: What's so Special about Nordic Public Service Media?,” in *Public Service Media from a Nordic Horizon: Politics, Markets, Programming and Users*, ed. Ulla Carlsson (Göteborg: Nordicom, Göteborg Universitet, 2013), 9–16.

45) DR, accessed November 12, 2020, <https://www.dr.dk/drtv/>.

46) Politiken, “Radikalt nej til TV-plan,” *Politiken*, January 27, 1983, 10.

47) Søndergaard, *DR i Tv-Konkurrencens Tidsalder*.

48) DR, *DR's public service-redegørelse 2019* (May 2020), accessed December 16, 2020, [https://www.dr.dk/static/documents/2020/05/01/drs\\_public\\_service-redegoerelse\\_2019\\_59d1e890.pdf](https://www.dr.dk/static/documents/2020/05/01/drs_public_service-redegoerelse_2019_59d1e890.pdf); DR, *MEDIEUDVIKLINGEN*

### 5.1 DR's Channel Portfolio

Until the launch of DR's second TV channel DR2 in 1996, one single DR TV channel had to cover all genres, e.g. news, children's programs, fiction and current affairs. With the launch of DR2, a distinct division of labor was introduced inspired by the BBC's model. DR1 was given the role of "our channel" with the popular, mainstream programs for the entire population, while DR2 got the identity of "my channel" with programs for the narrow target groups: youth programs, science programs and programs about fine art. Thus, the overall public service task was taken care of across the portfolio, not on the single channel. Also, with the following channels (DRK and DR Ramasjang launched in 2008, DR Ultra and DR3 launched in 2013), this strategy has been maintained even though the channel profiles have been changed and the number of channels reduced.

The different channel profiles of the portfolio provide an insight into the challenges DR has experienced over the years, not least the matter of competition. When the composition of the television channel portfolio was revised in 2014, it was decided to dedicate three of the six channels to the younger audience groups: one channel (DR Ramasjang) for the young children, one channel (DR Ultra) for the older children, and one channel (DR3) for the young adults aged 15–39. The reason for this decision was the increased competition with new platforms and services such as YouTube, Facebook and Netflix. In 2020 the six channels were reduced to three as a combined wish from DR and a political decision. DR Ultra, DRK and DR3 ceased to exist as flow channels by the end of 2019. Instead, they are, in different ways, continued as online universes.<sup>49)</sup>

### 5.2 DRTV's Video on Demand

DR's VoD service has developed considerably over the last 15 years. This reflects shifting approaches to the channel branding of VoD content. Throughout the history of DR's VoD, the hierarchy of web navigation has changed, reflecting the struggle between channels and content in search of an organizing principle for the VoD service. The first version, launched in October 2005, offered 31 videos: ten news programs, four documentaries, six entertainment programs, five consumer programs, two under the label 'Science', and four targeted children and teenagers.<sup>50)</sup> In 2010 the video on-demand service was relaunched, presenting a larger variety and number of programs. The new interface featured teaser texts introducing to the program content, listing of other programs in the same series, and tonight's broadcast schedule for the specific channel. The number of different available programs grows, e.g. in June 25, 2012 one can find about 470 different titles.<sup>51)</sup> In December 2020, we

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2019, accessed December 16, 2020, [https://www.dr.dk/static/documents/2020/01/22/medieudviklingen2019\\_0c11d1cb.pdf](https://www.dr.dk/static/documents/2020/01/22/medieudviklingen2019_0c11d1cb.pdf).

49) DR has announced that a new online universe called Minisjang will be launched in April 2021. The target group is children aged 0–3, and the ambition is to take up competition with YouTube. Research has shown that the youngest Danish children (and their parents) have a substantial media usage, which is currently not met by DR.

50) DR, "nettv", accessed August 3, 2019 through the Internet Archive Wayback Machine, <https://web.archive.org/web/20051026003719/http://www.dr.dk:80/drdrkTV/html/nettv.asp>

51) DR, "Nu: Alle programserier", accessed August 3, 2019 through the Internet Archive Wayback Machine, <https://web.archive.org/web/20120625012356/http://www.dr.dk/nu/programseries>. August 8, 2012 is the last capture of <http://www.dr.dk/nu/player/> by the Internet Archive Wayback Machine.

can find more than 1400 videos — individual programs as well as episodes — in the alphabetical listing of DR's VoD.<sup>52)</sup> More than 14.000 hours of TV has been available at DRTV during 2019, according to DR's public service account.<sup>53)</sup>

Until 2012, the on-demand videos were subsumed the channel structure, using the broadcast channels as organizing principle for the VoD content. An archived dr.dk web page from 2010 shows broadcast channels as the primary categorizing principle, alphabetical lists as subcategories. The navigational *bread crumb* text for the video “Drømmehaver” [Dream gardens] illustrates the channel hierarchy supplemented by an alphabetical listing: “Du er her [you are here]: dr.dk > DR2 > D > Droemmehaver”.<sup>54)</sup> The reference to the linear channel is in the 2012 interface removed, but the broadcast date and time is still shown along the video.

During its 15 years of existence DR's VoD service is increasingly being more and more curated. In 2015 the interface of the streaming service was substantially developed, not least in the numbers of programs being presented on the front page. Also, DR's role as a curator is more visible in 2015 than in 2012, as named categories signal to the user that the exposed programs have been chosen for a specific reason. The curation is also expressed in the page layout. From 2012 to November 2019 video content was promoted on the front page dr.dk/tv via five large pictures. The layout of the VoD page<sup>55)</sup> distinguishes between four different sizes of pictures / thumbnails of the video, clearly indicating the editorial decisions.<sup>56)</sup> The newest, the most seen, the pre-views and the “last chance” videos are promoted in separate sections along lists of genres and channels. In November 2019 this type of visual emphasis of five specially promoted programs ceased when the current VoD interface was launched under a new URL (dr.dk/drtv). In the new layout, all content is presented in horizontal rows, some high-lighted with background color as discussed above.

### 5.3 The Carousel and the Rows

The current interface layout of the VoD service has similarities with other VoD interfaces featuring large revolving pictures at the top of the screen, followed by a number of rows with medium-sized or smaller pictures. Each picture is a link to a TV-program, either an episode, a single program, or a series. A logo in the corner of each picture signals the channel brand of the video. The “News and Debate” row is emphasized with a dark gray-blue color at the otherwise white background of the DRTV web page.

Below the carousel we see 17 to 25 rows with pictures, for the entire sampling period we calculate an average of 21,5 rows. Each row represents what DR terms a “collection”, a collection of program titles which in most cases are manually or semi-manually curated,

52) DR, “A-Å,” accessed December 12, 2020, <https://www.dr.dk/drtv/a-aa> accessed 2020-12-12; included is all video content available from a Danish IP address.

53) DR, DR's public service-redogørelse 2019 (Tech. Rep.), 6, accessed December 16, 2020, [https://www.dr.dk/static/documents/2020/05/01/drs\\_public\\_service-redegoerelse\\_2019\\_59d1e890.pdf](https://www.dr.dk/static/documents/2020/05/01/drs_public_service-redegoerelse_2019_59d1e890.pdf).

54) DR, “Drømmehaver,” accessed August 3, 2019 through the Internet Archive Wayback Machine, <https://web.archive.org/web/20100416013345/http://www.dr.dk/DR2/D/Droemmehaver/>.

55) DR, accessed September 28, 2019, <https://www.dr.dk/tv>.

56) DR, “SE TV,” accessed August 3, 2019 through the Internet Archive Wayback Machine, <https://web.archive.org/web/20120914232554/http://www.dr.dk/tv>.

Row Labels / Row Number	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Grand Total
NYT FRA DR3	20	33	25	18	5	34	22	8	10	9	7															191
DANSK DRAMA I VERDENSKLASSE	19	3	21	34	23	5					2	36	28	14					3	3						191
ALTID GODT SELSKAB			3	11	27	37	7	18	5	4	4	13	12	26	19	5										191
DE NYESTE DANSKE DOKUMENTARER											1	27	22	11	21	33	8	11	10	11		2				157
DE STØRSTE PROGRAMMER LIGE NU	12	29	31	1	14	28	27	5	2																	149
UGENS FIKTIONSSERIER - NYT HVER FREDAG	16	5	25	13	6	4	4	15	31	15	5															139
Kom med bag facaden											1	17	3	8	4	14	29	23	5							104
Skæbner fra en vild verden - på under 10 minutter											1	12	16	4	2	1	19	6	17	12	12			2		104
De bedste fiktionsserier fra DR3			1	5	4	1	5	25	16	8		1	17	3	8				8	2						104
Mest sette på DRTV	73																									104
Det bedste fra DR2 Temalørdag										1	15	3	3	7	4	14	29	23	5							104
Danske kulturpersonligheder																	2	1	19	18	34	16	12		2	104
Dokumentar på DRTV - ugens udvalgte	1	5	1		1	17		4	9	31	27	5	3													104
Danske film				1	18	12	31	20	11	8	2															103
Store udenlandske dramaserier											4	6	28	36	8	8			8		2					100
HUDLØST ÆRLIGE DOKUMENTARER											4	9	51	17					4	9	51	17	2	3	1	87
DANSKE TALENTFILM																										87
DE BEDSTE SERIER FRA DR3	2	8	25	12	19	18	3																			87
SKÆBNER FRA EN VILD VERDEN - PÅ UNDER 10 MINUTTER									1	10	23	14	1		29	9										87
ANMELDERROSTE DOKUMENTARFILM											4	9	51	17					2	3	1					87
KRIMISAGER FRA VIRKELIGHEDEN											4	9	51	17					2	3	1					87
DOKUMENTAR PÅ DRTV - UGENS UDVALGTE	2	19	33	33																						87
NYHEDER OG MAGASINER	6										1	34	28	11				1	1							82
SIDSTE CHANCE																		1	8	48	17	2	1	1		78
KRIMI- OG SPÆNDINGSSERIER									2	36	29	10														77
STÆRKE NORDISKE DRAMASERIER								1	11	49	11															72
KLAR TIL KLIMAKAMP		5		4	3	7	12	27	10	3																71
MEST SETTE				5	19	33	3																			60
De stærkeste DR3-dokumentar																		4	3	21	23	6				57
Kom i julestemning	3	15	4	4		1	14		1	1																43
BAG NYHEDEN - KORT FORTALT	29								1	5	6															41
MED ANDRES ORD - TÆT PÅ DANMARKS STØRSTE FORTÆLLINGER	7	14	1			7	11																			40
Nyt fra DR2+	30	6	1																							37
Personlige fortællinger du kan mærke													1	1	15	3	8		6	2						36
DANSKE DOKUMENTARER											1	9	11	7				3	3							34
Nyt år - et bedre mig?	1	5	12	11	2																					31
AKTUELLE PROGRAMMER	21	3	6																							30

Figure 1: The hierarchy of DRTV’s collections: The number of days collections have been shown at different row numbers, with total number of exposure days in the Grand Total column. Row number 2 is positioned at the top of the page, directly under the revolving “carousel”. Plot for collections present 30 days or more in the data set. Time-span: 2019-08-13 to 2020-03-01 (191 days)

see the later section on personalization. We observe a high degree of stability in the exposure of a subset of the row headings — the titles of the “collections”: 15 row headings are present more than 50 percent of the days, five row headings are present every of the 191 days in the data set.<sup>57)</sup> Other seven row titles are present more than 40 per cent of the days.<sup>58)</sup> In figure 1 we observe a certain stability in page position of collections that demonstrates a hierarchy of DRTV’s collections.

Some collections are centered on a theme, e.g. “Klar til Klimakamp” (“Ready to fight for the climate”) while others refer to a linear TV channel, or a genre. Seven of the collections contain documentary, current affairs or news programs, while five collections contain drama or crime content. Two collections contain “feel good” videos, e.g. on lifestyle or infotainment. Three collections are promoting specifically Danish content, e.g. “New Danish Documentaries” or “Danish World-class Drama”, while one collection promotes

57) “Dansk drama i verdensklasse”, “De bedste fiktionsserier fra DR3”, “Dokumentar på DRTV — ugens udvalgte”, “Nyt fra DR3”, “Skæbner fra en vild verden — på under 10 minutter”. Row headings are unfortunately not documented in the dataset before August 13, 2019 due to a technical error.

58) Row titles as on screen: “ANMELDERROSTE DOKUMENTARFILM”, “DANSKE”, “HUDLØST ÆRLIGE DOKUMENTARER”, “KRIMISAGER FRA VIRKELIGHEDEN”, “NYHEDER OG MAGASINER”, “SIDSTE CHANCE”, “KRIMI- OG SPÆNDINGSSERIER”. Over time DRTV uses both majuscules and minuscules for row titles.

“Strong Nordic Drama”. Finally, some collections are more functional showing “Most Popular” or “Last chance” (for viewing), or “live now”. Continuously new collections are added, while other are removed as VoD page editors react on planned and unforeseen events, e.g. elections or theme-related campaigns run across the whole media organization. The only channel that is explicitly mentioned in the VoD collections is DR3, the youth-universe, via collections named “News from DR3” and “The best series from DR3”. DR3 is present throughout the entire sampling period. Out of 65 different row headings over the sampling period, the word “DR3” is present in six of these with an aggregated exposure of in total 473 days. Scrolling down the page we see some rows are highlighted with a background color. The row “Nyt fra DR3” (News from DR3) is from January 22, 2020, highlighted consistently with a pink color, reflecting the channel’s new life as an online-only option. While DR3 is explicitly mentioned in four of the collections shown in figure 1 (“News from DR3”, “The best fictional series from DR3”, “The best series from DR3” and “The strongest DR3 documentaries”) and indirectly referred to through the title “Totally honest documentaries” (Hudlst ærlige dokumentarer) — a catch line for the DR3 brand, DR2 is referred to twice: “DR2 Theme Saturday” and “News from DR2+”, the latter highlighted in the interface with a brown-yellow color. The main channel DR1 is not mentioned in any of the collection titles, but if we take a closer look at the collection “The biggest programs” 52 per cent are DR1 programs. Both the “News from DR2+” collection and the “News from DR3” collection are — with small deviations — located at the same place in the interface in the sampling period, see Figure 2.

Bruun uses the notion of the broadcast scheduling strategy of “tent-poling” to describe the advantages of a VoD landing page.<sup>59)</sup> “Tent-poling” is the scheduling principle where two strong programs are placed around a weaker (a less popular or a new) program with

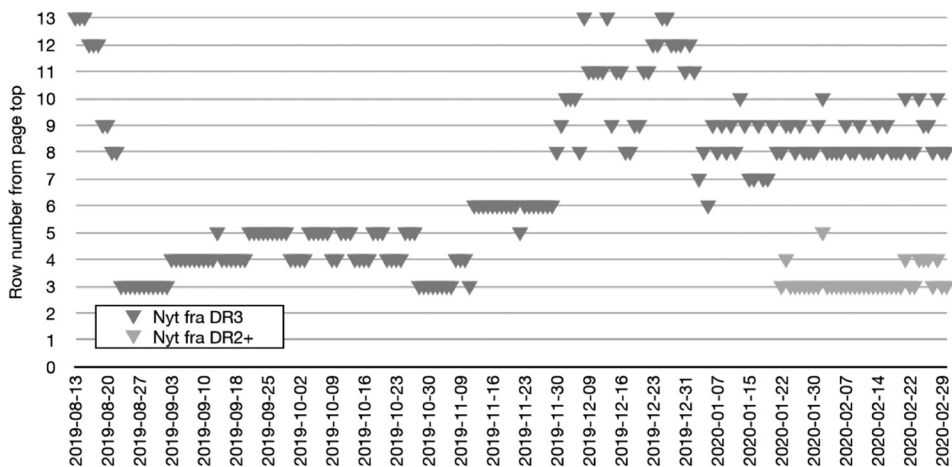


Figure 2: The positions of the “Nyt fra DR3” and “Nyt fra DR2+” rows at the DRTV front page over 191 days (2019-08-13 to 2020-03-01)

59) Bruun, *Re-Scheduling Television in the Digital Era*, 95.

the ambition of lifting the viewing figures of the weak one.<sup>60</sup> Following Lotz,<sup>61</sup> Bruun points out that on the VoD landing page only the “tent-pole programs” are necessary, not the weaker programs that are used to fill out the schedule of the linear broadcast channel.<sup>62</sup> This is clearly reflected in our findings: It is DR’s own productions, the expensive programs, and/or the “big” programs that also is/would have been broadcast during prime time that is exposed on the VoD landing page, and especially in the top collections.

**5.4 Visibility of Programs**

The empirical observations indicates that a VoD interface is not a simple database of content that can be accessed by users. Johnson describes how a hierarchy is created when the content of an online streaming service is arranged on a vertical axis.<sup>63</sup> The programs that are visual when the user enters the service will, naturally, get more attention than the programs placed further down. The same goes for the horizontal axes; the further to the right, the less attention. In case of DRTV, four to six programs — depending on the size of the still photo that represents the program — are visible to the user without horizontal scrolling (with a browser width of approximately 1300 pixels). Of the in total 112592 program items shown during the sampling period (4589 unique program titles), 3073 items were shown in the carousel at the top of the page (1149 unique titles). Below the top carousel 109519 items were shown throughout the sampling period, representing 4311 unique program titles. Of these 27952 items (1934 unique) are placed at visible part of the rows (assuming six visible items) whereas 81567 items are only visible when the user scrolls horizontally. Only one third of all program items are visible without horizontal scrolling. However, if we look at unique program titles over the whole sampling period, we see that four out of five program titles have been shown in the visible part of the page at some point of time.<sup>64</sup> See Table 1 for an overview.

	All Program items	Unique Program titles
Total no. of items in the data set	112592	4589
Items shown in carousel	3073	1149
Items shown in rows below the carousel	109519	4311
Items below the carousel, visible without horizontal scrolling	27952	1934
Items below the carousel, <i>not</i> visible without horizontal scrolling	81567	2377

Table 1: Distribution of Programs at the DRTV page, March 2019–March 2020 (337 days sampled)

60) Susan Tyler Eastman, and Douglas A. Ferguson, *Broadcasting / Cable Programming Strategies*. 5th ed. (Belmont CA: Wadsworth, 1997). See also Susan Tyler Eastman, and Douglas A. Ferguson, *Media programming: Strategies and practices* (Boston: Wadsworth, 2012).

61) Amanda D. Lotz, *The Television Will Be Revolutionized* (New York and London: New York University Press, 2014).

62) Bruun, *Re-Scheduling Television in the Digital Era*.

63) Catherine Johnson, “Beyond catch-up: Vod interfaces, itv hub and the repositioning of television online,” *Critical Studies in Television* 12, no. 2 (2017), 121–138.

64) Personalized or random composition of the sequence of items in the row could result in another number of “invisible” items.

### 5.5 Channel-presence in the VoD

The representation of channels in the VoD — expressed via the labelling of the VoD content with channel logos — has also changed over the years. In 2010 no channel logos were attached to the presented programs on the front page of DRTV. In 2015 some of the programs had the logo from the linear channel on which they were originally broadcast, while others did not. In 2020 channel logos were used as “headlines” for some of the rows and programs presented in the carousel were consistently marked with channel brand logos, as described above. The rest of the thumbnail pictures contains no channel logos. According to one of the editors of DRTV this praxis reflects an ongoing discussion in DR concerning the role of the channels in the online universe: While some want to make DRTV an independent VoD platform with little or no connection to the linear broadcast channels, others have argued that having a channel logo in the online universe is an important indication of the programs’ “flavor”, style and expression, that can help the viewer to decide what program to watch. Besides the presence of channels at the DRTV front page, each channel — also the online-only brands such as DR3 and the children’s DR Ultra — have own pages with content recommendations and alphabetical program overview at the site, e.g.: <https://www.dr.dk/drtv/dr1>. Channels are present in the DRTV front page also in a more indirect way. When browsing the interface viewers of the linear channels may recognize program brands from the flow schedule at the VoD page. To examine this possible synergy between linear TV and VoD we have calculated the percentage of program titles shown in the VoD also appearing in one or more flow channel schedules.

In Figure 3 we see the development for channels over one year, for the whole page: DR1 has a slightly increasing share, while DR3 and particularly DR2 has a declining share.

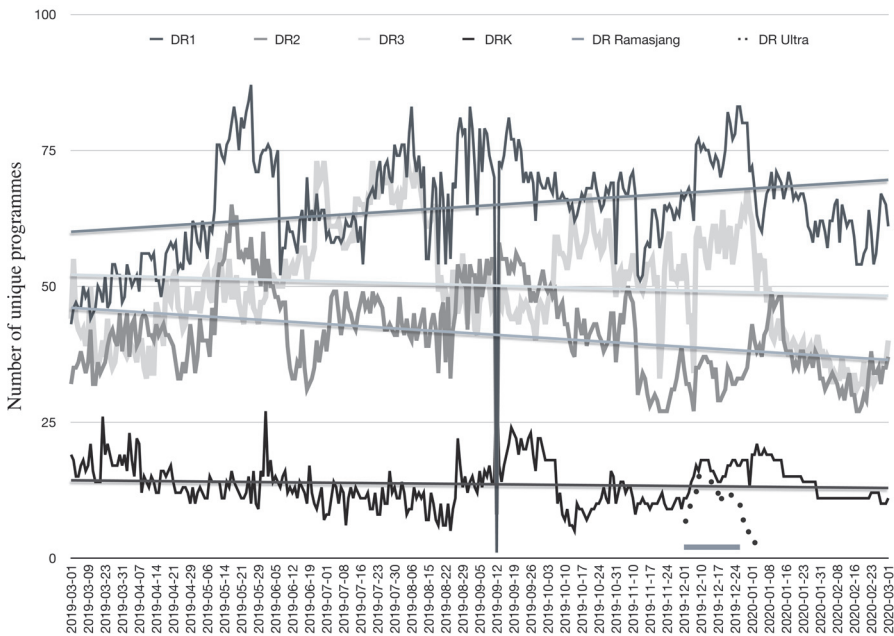


Figure 3: DR flow channel programs present at the DRTV front page, March 2019 — March 2020 (337 days sampled) with trendlines



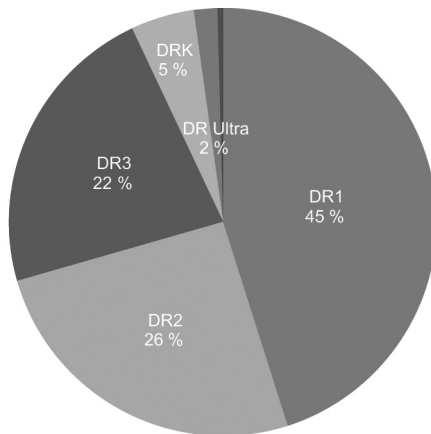


Figure 4: Distribution among channels in percent for DR flow channel programs present at the DRTV front page, March 2019–March 2020 (337 days sampled), page top — first three rows

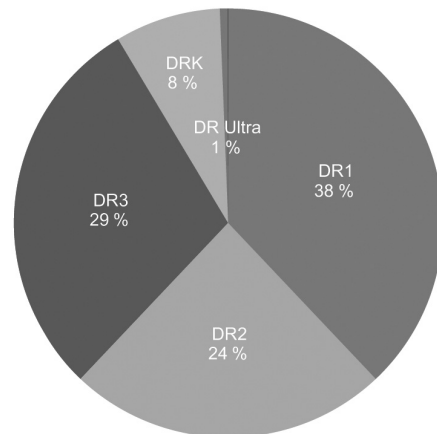


Figure 5: Distribution among channels in percent for DR flow channel programs present at the DRTV front page, March 2019–March 2020 (337 days sampled), whole page

DR Ramasjang and DR Ultra are only sporadically present in the VoD. DRK is throughout the sampling period present, but at a low level. This reflects the fact that the linear channel DRK ceased to exist in January 2020. In Figure 4 we see the distribution among the channels for program titles in the upper three rows (carousel and two rows below). DR1 leads while the small children's channel DR Ramasjang is barely visible. However, DR Ramasjang and DR Ultra have their own entrances subsumed the front page of DRTV. In Figure 5 we see the similar calculation for all program titles.

When we analyze the videos being marketed in the most prominent way — via the slide show (carousel) — we see a clear dominance of videos from three of DR's six channel brands. Over a period of 337 days from March 2019 to March 2020 we have registered the content in the slide show and on the page. We find that the mainstream channel DR1 dominates in exposure, both in the whole page and in the top three rows. The DR1 channel is present in the carousel 321 of the 337 days. With some margin the linear channel DR2 and the online-only brand DR3 follows, but when we look at the entire page DR3 is the most exposed channel brand of the two. Programs from the DRK channel, specialized on culture, are only shown 80 of the 337 days, whereas DR3 programming is present in the carousel 277 of the 337 days, and DR2 270 days.<sup>65)</sup> Videos from the children's channels are very close to absent. In the linear world DR1 continues to be the main channel, aimed at the entire population. The programs deemed most important by DR are scheduled at the main channel, and DR1 is prioritized also financially. Our data shows that the prioritization of content at the front page of DR's VoD service follows the prioritization of the broadcast channels, except for a greater emphasis on the youth-segmented channel brand DR3. This exemplifies a paradox: a once linear brand is used to promote content in a VoD interface. According to Henrik Birch, head of publishing in DR, DRTV is for all age and

65) In some cases, videos belong to more than one channel.

target groups. But at the same time, he admits that DR has a special focus on appealing to the younger audiences, those who are leaving the linear television medium and use streaming services instead.<sup>66)</sup> When we thus see a strong emphasis of the DR3 channel in the VoD interface it is also important to note that the linear channel has been closed. This has — not surprisingly — meant a decline in DR3's viewing figures,<sup>67)</sup> and the channel brand “needs” a prominent position in the VoD to (continue to) be visual in DR's online offer.

Drawing on Johnson's<sup>68)</sup> terminology, DRTV is what we could term “TV native”, that is a VoD service that originates from a broadcaster. This provides the service with a strong brand, but also entails some challenges regarding the transition from linear to VoD: A very simple, but still important issue to decide is to what extent the broadcast channels should continue their existence online? As stated above: For the linear TV service the channels are important identity markers. The channels guide the viewers in their choice, and the channel logo plays a key role in linking each program to a specific channel and thus gives it a certain identity: Is this a program intended for the young viewers, is it high-brow, or is it mainstream? In an online VoD service the channels cease to exist, and the channel logos become redundant. However, if we look at the way DR uses the channel logos in the VoD service we find that practices have changed over time — and that the current use expresses an uncertainty.

## 6 Personalization

Behind the DRTV's interface an advanced publishing software system since November 2019 enables both personalization and algorithmic composition of collections. One of the authors of this article has via in-depth interviews over four years followed and analyzed the process of selecting and implementing the new system.<sup>69)</sup> After about five months where the algorithm was trained to learn from users' behaviors, the system for personalized recommendation of DRTV content was launched April 2020.<sup>70)</sup> One of the objectives of the personalization project was, according to the former project leader Jacob Faarvang, to address the shortcomings in user-friendliness. A survey commissioned by DR had shown that DR's VoD was perceived as less user-friendly by users compared to other VoDs in the Danish market, e.g. Netflix and the Danish PSM competitor “TV2 Play”, lacking

66) Lassen, “DRs tv-virksomhed i forandring,” 162.

67) Louise Reseke, and Thomas Nygaard Madsen, “DR Ultra Og DR3 Taber de Unge i Stor Stil Efter Lukning Af Tv-Kanaler,” *MediaWatch*, August 2020, accessed May 18, 2021, <https://mediawatch.dk/Medienyt/TV/artikel12336353.ece>.

68) Catherine Johnson, *Online TV* (London: Routledge, 2019).

69) Jannick Kirk Sørensen, “The Datafication of Public Service Media Dreams, Dilemmas and Practical Problems: A Case Study of the Implementation of Personalized Recommendations at the Danish Public Service Media ‘DR,’” *MedieKultur: Journal of media and communication research* 36, no. 69 (2020), 90–115, <https://doi.org/10.7146/mediekultur.v36i69.121180>.

70) Miriam Hindsgaul, “DRTV Klar Med Personlige Anbefalinger Til Brugerne,” DR Press release, February 2020, accessed May 18, 2021, <https://www.dr.dk/om-dr/nyheder/drtv-klar-med-personlige-anbefalinger-til-brugerne>.

functionalities such as recommendations, storage of personal favorites and “remember me”<sup>71)</sup> The new DRTV is not DR’s first attempt to personalize the content. Sørensen<sup>72)</sup> describes how DR 2006–2011 developed and launched a customizable interface that allowed users to compose their own news page, inspired by the then popular RSS customization service Netvibe.<sup>73)</sup> Despite many technical endeavors to develop the customizable page, the users showed very little interest. The concept of customer sovereignty remained however of importance to DR. Head of dr.dk Nicolai Porsbo stated in 2010 in a press release that the intention with the VoD service *DR NU* is to signal that users themselves decide what and when to watch.<sup>74)</sup>

Although the new VoD publishing system — provided by one of the commercial TV industry’s major software providers, Think Analytics — enables very sophisticated publishing strategies such as micro-segments based on user behavior, dynamic creation of collections, personalization, and advanced conditional business rules, DRTV’s current use of the system is limited to a few rows / collections. This contrasts the original visions where the system was seen as a tool for innovating DR’s publishing strategies (Sørensen, 2020a). The limited personalization is partly caused by problems with DR’s metadata which not in all cases is suitable for personalized recommendations as it is based on high-level content categories used for public service audit reporting and budgeting as e.g. in DR’s public service account.<sup>75)</sup> The personalization is partly also curbed by technical performance problems, and by the obligatory GDPR-motivated cookie consent dialogue box. About 40 percent of DRTV’s users decline the cookie consent. This leads not only to less precise personalized recommendations for these users, but also to a generally lower quality of recommendations.<sup>76)</sup>

The personalization of the VoD service is, from an organizational perspective, not an independent data optimization project but is an integrated part of DRTV’s curation activities. It is placed in the scheduling department. An optimization specialist configures, in collaboration with the DRTV editors, the personalized collections. It is to him and the editors essential to keep DR’s “tone-of-voice” — the appearance of DRTV to users; the quality of the algorithmic recommendations should be as good as human editors’ curation. The personalization is not an objective in itself, but is one of many tools for the curation. A hybrid form of personalization can be seen in some collections / rows: The programs are selected by a human editor but the sorting order is personalized by the algorithm to predict the programs that are most likely to be seen by the specific user. In this way programs will be exposed in different orders, except for e.g. the first one or two items which can be manually locked by an editor. It is expected that this method will give a higher exposure of programs that otherwise would hide behind the horizontal scroll button, and thus it may contribute to increasing the exposure of DRTV’s entire catalogue.

71) TV2, accessed August 28, 2019, <https://play.tv2.dk>.

72) Sørensen, “The Paradox of Personalisation”; Sørensen, “PSB goes Personal.”

73) Netvibes, accessed August 27, 2019, <https://www.netvibes.com/en>.

74) Rasmus Strøyer, “DR Tv På Nettet Får Nyt Navn,” DR Press release, May 2010, accessed May 18, 2021, <http://www.dr.dk/Nyheder/Kultur/2010/05/25/135251.htm?rss=true>.

75) DR, “DR’s Public Service-Redegørelse 2019.”

76) Sørensen, “The Datafication of Public Service Media Dream.”

The introduction of algorithmic recommendation at DRTV opens many new opportunities for bundling content. The composition of collections can be personalized, and collections can even be generated based on user preferences. The new possibilities trigger, however, also many questions: What will be the future of manually curated channels and collections? Will filter bubbles emerge? How are DR's public service mission and obligations reflected in the algorithmic recommendations? For PSM, recommender algorithms challenge both values and objectives.<sup>77)</sup> While the objective of commercial platforms alone may be to increase consumption and loyalty, e.g. via personalized recommendations,<sup>78)</sup> the editorial policies and the PSM objectives introduces additional requirements to the algorithms.<sup>79)</sup> Thus a number of questions emerge, e.g.: How should the objective of recommending diverse programming be interpreted in algorithms, how should filter bubbles be avoided?<sup>80)</sup> While having the attention of PSM organizations, these questions are still to be answered.<sup>81)</sup> The introduction of algorithmic recommendation in media has resulted in a number of publications that either discusses the normative tensions between personalization and public service media or the general change of power as algorithms make decisions previously taken by humans.<sup>82)</sup> The algorithmic selection of content is inexplicable and not accountable to humans.<sup>83)</sup> The use of the popular algorithmic method *collaborative filtering* can result in a too narrow set of recommendations caused by *over-fitting* in the calculation of correlations.<sup>84)</sup> Popularized by Eli Pariser<sup>85)</sup> (2011), the concept of *filter bubbles* echoes thus a general concern of social fragmentation of societies, cf.: Putnam (2000)<sup>86)</sup>

77) Jannick Kirk Sørensen, "Public Service Media, Diversity and Algorithmic Recommendation: Tensions between Editorial Principles and Algorithms in European PSM Organizations," *CEUR Workshop Proceedings of 7th International Workshop on News Recommendation and Analytics (INRA 2019)* 2554 (2019), 6–11, accessed May 18, 2020, [http://ceur-ws.org/Vol-2554/paper\\_01.pdf](http://ceur-ws.org/Vol-2554/paper_01.pdf).

78) Tanya Kant, "Giving the 'Viewer' a Voice? Situating the Individual in Relation to Personalization, Narrowcasting, and Public Service Broadcasting," *Journal of Broadcasting & Electronic Media* 58, no. 3 (2014), 381–399, <https://doi.org/10.1080/08838151.2014.935851>.

79) Jan-Hinrik Schmidt, Jannick Kirk Sørensen, Stephan Dreyer, and Uwe Hasebrink, "Wie Können Empfehlungssysteme Zur Vielfalt von Medieninhalten Beitragen? Perspektiven Für Öffentlich-Rechtliche Rundfunkanstalten," *Media Perspektiven*, no. 11 (2018), 522–531.

80) Jannick Kirk Sørensen, and Jan-Hinrik Schmidt, "An Algorithmic Diversity Diet? Questioning Assumptions behind a Diversity Recommendation System for PSM," 2016, accessed May 18, 2021, [https://www.researchgate.net/publication/308721307\\_An\\_Algorithmic\\_Diversity\\_Diet\\_Questioning\\_Assumptions\\_behind\\_a\\_Diversity\\_Recommendation\\_System\\_for\\_PSM](https://www.researchgate.net/publication/308721307_An_Algorithmic_Diversity_Diet_Questioning_Assumptions_behind_a_Diversity_Recommendation_System_for_PSM).

81) Jannick Kirk Sørensen, and Jonathon Hutchinson, "Algorithms and Public Service Media," in *Public Service Media in the Networked Society RIPE@2017*, eds. Gregory Ferrell Lowe, Hilde Van den Bulck, and Karen Donders (Göteborg: Nordicom, Göteborg Universitet, 2018), 91–106, accessed May 18, 2021, [http://www.nordicom.gu.se/sites/default/files/publikationer-hela-pdf/public\\_service\\_media\\_in\\_the\\_networked\\_society\\_ripe\\_2017.pdf](http://www.nordicom.gu.se/sites/default/files/publikationer-hela-pdf/public_service_media_in_the_networked_society_ripe_2017.pdf).

82) Taina Bucher, *If...Then: Algorithmic Power and Politics* (New York: Oxford University Press, 2018).

83) Blake Hallinan, and Ted Striphas, "Recommended for You: The Netflix Prize and the Production of Algorithmic Culture," *New Media & Society* 18, no. 1 (January 2016), 117–137, <https://doi.org/10.1177/1461444814538646>.

84) Badrul Sarwar, George Karypis, Joseph Konstan, and John Reidl, "Item-Based Collaborative Filtering Recommendation Algorithms," *Proceedings of the 10th international conference on World Wide Web (ACM, 2001)*, 285–295, <https://doi.org/10.1145/371920.372071>.

85) Eli Pariser, *The Filter Bubble: What the Internet Is Hiding from You* (Penguin Books, 2011).

86) Robert D. Putnam, *Bowling Alone: The Collapse and Revival of American Society* (New York: Simon & Schuster, 2000).

and a fear of losing agency to the machines. However, after a decade with media personalization it has proven difficult to show empirically that algorithms create filter bubbles.<sup>87)</sup>

DR applies a pragmatic black-box approach to the algorithmic opacity.<sup>88)</sup> As long as the output of the algorithm can be inspected, the exact processes of the recommender system are less relevant. This approach may be relevant despite its opacity. Sørensen (2020) discerns between different levels of control, observing that the basic algorithmic principles are the same (more or less) for all recommender systems.<sup>89)</sup> These are thus less interesting as objects for control and inspection than the configuration of the specific recommender system and the data it is fed with, e.g. the quality of the metadata and amount of user-behavioral data used for the calculations. The effect on the exposure of the content through personalization is yet to be seen, but as most of the content shown at the new page still will remain manually curated, the immediate effects of personalization will probably be small. The current success of dr.dk/drtv does not put a pressure on DR to optimize exposure with the help of personalization, instead algorithms can be used to display a bigger part of DRTV's catalogue. Maintaining distinctiveness not only in the programming but also in the curation may be both a media political advantage and presenting users with a distinct and recognizable product. Being curated by editors and not personalized by algorithms may be a better value proposition — and something DR verbalizes in the media political negotiations. The 2017 edition of DR's public service report stresses that DRTV should be offered to users on equal terms with DR's flow channels, furthermore that DRTV's content and the curation should be distinct from commercial streaming services. Finally, the report promises, without too many details, the development of a "public service algorithm". The emerging question is whether algorithmic recommendations in a PSM context can be applied in other ways than those perfected by Netflix and other tech-companies? DR's first steps into algorithmic recommendation are however both small and careful.

## 7 Discussion

The growing importance of streaming services puts legacy broadcasters in a dilemma in respect to exposure and bundling of content. Broadcasting schedules that traditionally centered on main- and niche channels now must co-exist with VoD offers, triggering e.g. the question whether new attractive content such as series episodes should be published first in the VoD interface or only after broadcast. Another, more fundamental problem is the evolution of channel curation and channel identity: What is the relation between

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87) Frederik J. Zuiderveen Borgesius, Damian Trilling, Judith Moeller, Balázs Bodó, Claes H. de Vreese, and Natali Helberger, "Should We Worry about Filter Bubbles?" *Internet Policy Review* 5, no. 1 (2016); Tien T. Nguyen, Pik-Mai Hui, F. Maxwell Harper, Loren Terveen, and Joseph A. Konstan, "Exploring the Filter Bubble: The Effect of Using Recommender Systems on Content Diversity," in *Proceedings of the 23rd International Conference on World Wide Web — WWW '14* (Seoul, Korea: ACM Press, 2014), 677–686, <https://doi.org/10.1145/2566486.2568012>.

88) Tarleton Gillespie, "The Relevance of Algorithms," in *Media Technologies*, eds. Tarleton Gillespie, Pablo J. Boczkowski, and Kirsten A. Foot (The MIT Press, 2014), 167–194, <https://doi.org/10.7551/mitpress/9780262525374.003.0009>.

89) Sorensen, "The Datafication of Public Service Media Dreams."

channel identity and curation in a broadcast context, and the exposure of content online? Does it make sense in the presentation and marketing of the content online to maintain the reference to the broadcast channel where the content also has been shown? It will be interesting to see whether channel brands such as DR3 will remain strong indicators of curated selections in a personalized VoD or whether new labels and brands will take over their place. This should be seen in relation to the media-political construction of channels, exposure, and scheduling as signs of the fulfilment of public service contracts, and as interpretation of public service values. For now, we can note that the use of channel logos in DRTV falls between two chairs: between continuation and elimination.

For media organizations, streaming is a familiar continuation of the broadcast (as also described by Bruun<sup>90</sup> in her study of the Danish TV organization TV 2), but personalized recommendations have a disruptive effect on traditional programming and scheduling methods. As pointed out above, it is within the remit of the legacy PSB to address and strengthen the societal cohesion. But whereas Netflix, according to Tryon, seek to create a sense of collectivity through collective binge-watching experiences, a PSM organization such as DR is also obliged to provide a versatile and manifold program offer. While it has never been required of DR to ensure a diverse reception, there is, however, an implicit expectation that a versatile supply can stimulate diversity of reception.<sup>91</sup> The study of DRTV's use of personalization<sup>92</sup> shows that maintaining the unison organizational voice expressed in the linear TV publishing strategies and in the manual curation of VoD interfaces is more important to PSM organizations than the potential optimization of exposure and consumption that one could hope from personalized interfaces. Put differently: PSM organizations' success criteria may be less driven by the kind of economical optimization one would see in a commercial context, but more driven by the creation and maintenance of a collective shared experiences of ideas. The user's consumption of high-profiled programming related to strong channel brands may be more important for the PSM organization than the economical optimization of the utilization of the long tail specialized content powered by sophisticated and complex algorithmic systems, as used e.g. by YouTube.<sup>93</sup> In balancing the interests of creating a strong "we" versus serving particular needs of a single "me"<sup>94</sup> the "we" wins internal organizational discussions, backed by the path-dependencies in PSM policies, despite rhetoric about customer sovereignty.

90) Bruun, *Re-Scheduling Television in the Digital Era*, 112.

91) Lassen, "Multichannel Strategy?"

92) Sørensen, "The Datafication of Public Service Media Dreams."

93) Zhe Zhao, Ed Chi, Lichan Hong, Li Wei, Jilin Chen, Aniruddh Nath, Shawn Andrews, Aditee Kumthekar, Maheswaran Sathiamoorthy, and Xinyang Yi, "Recommending What Video to Watch next: A Multitask Ranking System," in *Proceedings of the 13th ACM Conference on Recommender Systems — RecSys '19* (Copenhagen, Denmark: ACM Press, 2019), 43–51. <https://doi.org/10.1145/3298689.3346997>.

94) Uwe Hasebrink, and Hanna Domeyer, "Zum Wandel von Informationsrepertoires in Konvergierenden Medienumgebungen," in *Die Mediatisierung Der Alltagswelt*, eds. Maren Hartmann, and Andreas Hepp (Wiesbaden: VS Verlag für Sozialwissenschaft, 2010), 49–64.

## 8 Conclusion

Public service media organizations are still split between serving the broadcast audience with channel curation and VoDs that compete with streaming services. However, the public service obligations, missions, and values place PSM organizations in another position than those of the streaming services. In this article we have argued, with Danish DR as case, that not being Netflix is actually a productive position for the legacy public service broadcaster, as the institution can curate the content with very specific values in mind. This can be observed in how differently personalization is approached, and in DRTV's very active curation of a selection that is offered more or less unchanged to all users regardless of viewing habits or preferences.

The recommendation and curation strategies of DR reflect rather a traditional channel-oriented public service agenda-setting than an attempt to optimize viewing: The VoD seems both wanting to reinforce the DR1 brand, promote the less used DR3 brand, and promote content with a strong affiliation with the DR public service brand: documentaries, news, and drama. This signals a clear public service distinctiveness. Provocatively, we could argue that the VoD page acts more as a traditional agenda-setter than a free-choice interface for customer sovereignty "on demand". Users are nudged to see certain content via the positioning of content elements at the VoD page. The visual organization of the DRTV VoD interface signals curation and editorial prioritization.

Personalization will thus not mean optimization towards narrow user interests, rather it will be a sorting of the already curated collections to optimize for different users. In this sense, also the algorithmic recommendations are curated, however now in a more indirect way. The new personalization technologies are thus, despite their assumed power in optimizing exposure and consumption, subsumed the idea of curated channels and themes common for all users. The on-demand interface thus reflects a broadcaster agenda-setting.

PSM obligations such as promoting national culture and language are more explicitly visible at the VoD page than values such as diversity. These values are rather being expressed via the content. The composition of the VoD represents a half-way attempt to abandon channels as curated collections of content, towards curation centered on topics, genres, and themes. The VoD thus represents a step away from channel editing but remains an expression of explicit curation.

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