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Article – Theme section

Public service algorithms

Balancing the scales between public mission and market pressures at the BBC and VRT

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Abstract

The public service media (PSM) shift to digital-first strategies has generated a rethinking of priorities in content production and distribution. This not only involves the integration of algorithms for the curation of their video-on-demand portals, but also a far-reaching reform at the organisational level. As personalisation through recommender systems is increasingly popularised by commercial streaming services, PSM are faced with a balancing act between market pressures and fulfilling their public mission. This article contributes to this discussion by investigating how public service algorithms are developed in practice in the cases of the BBC (UK) and VRT (Flanders-Belgium), and how their implementation is guided by the organisations' remits. Through document analysis and semi-structured interviews conducted in 2024 with 16 PSM representatives, we discuss the ways in which market, policy, and organisational contexts inform the use of algorithms by the two organisations and suggest the need for a re-theorisation of public service algorithms.

Keywords

Public service media, public service algorithm, video-on-demand, universality, diversity, comparative analysis

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Introduction

The public service media (PSM) shift to digital-first strategies and increased focus on their video-on-demand (VoD) portals generate challenges for reaching the public remit, particularly the principles of universality, diversity, and trust. As personalisation through recommender systems is popularised by commercial streaming services, PSM face the challenge of integrating algorithmic personalisation into their own VoD systems. Scholars have called for the development of public service (PS) algorithms as a potential solution to the problems generated by the rise of algorithmic culture several years ago, proposing, among other things, audience empowerment through interactivity (Bennett & Strange, 2011) and diversity by design (Bennett, 2018; Helberger, 2011). Since then, PSM organisations have begun to explore using algorithms to reach objectives beyond commercial appeal, from exposure diversity (Iordache & Raats, 2023) to engagement diversity (Hildén, 2021). Yet research on the practical implementation of algorithms is largely focused on the commercial context (see Gomez-Uribe & Hunt, 2016; Hallinan & Striphas, 2016; Pajkovic, 2021), with little research on how PSM attempt to balance demands for audience reach and public responsibility (Sørensen & Hutchinson, 2018) in their development and use of algorithmic personalisation.

This article contributes to these debates by investigating how PS algorithms are developed in practice in the cases of the BBC (UK) and VRT (Flanders-Belgium), and how their implementation is guided by the organisations' remits and influenced by contextual factors. The research combines an analysis of policy and strategy documents with semi-structured interviews with 16 key PSM representatives at both organisations. Although significantly different as media markets, Flanders and the UK share a strong PSM presence, with relatively high reach and levels of audience trust. In recent years, both organisations have made public commitments to strengthening the online presence of their VoD portals and developing PS algorithms. However, there are also illuminating differences between the BBC and VRT that raise questions about the ways in which market, policy, and organisational contexts inform the use of algorithms by PSM.

We start with a brief assessment of the growing body of work on the platformisation processes that PSM are currently undergoing. This is followed by the methodological design and the results of the study, which focus on the different considerations for developing, implementing, and assessing PS algorithms in practice in each broadcaster. Despite the techno-optimism evidenced in the promise of PS algorithms, we argue that their potential is constrained by the organisational, ideological, and political contexts within which each PSM operates. Emerging practices appear to negotiate pre-existing ideals, and the process of developing algorithms that can be shaped by public service principles is sometimes challenged by PSM representatives. In the conclusion, we suggest the need for a re-theorisation of PS algorithms and set out potential avenues for researching the topic in different market contexts.

The challenges of personalisation and the promise of public service algorithms

The integration of algorithmic personalisation by PSM has sparked concerns across multiple domains, including policymakers, civil society, and media scholars. These apprehensions stem from potential conflicts between commercial standards, user expectations, and core PSM principles. A possible solution to these challenges lies in the development of PS algorithms, which require moving "beyond the discourses of choice […] and singular emphasis on viewing figures in a market-led approach to algorithms" (Bennett, 2018, p. 116) while enhancing user agency to foster legitimacy and engagement (Hutchinson, 2023). Such algorithms must also bridge the gap between PSM's abstract guiding principles and the concrete technical design of recommender systems (Carillon, 2024). Nevertheless, discussions on PS algorithms, specifically for PSM VoD services, remain limited and primarily focus on notions of diversity and user choice.

A central concern in the extant literature is the narrowing of media consumption through personalisation, which could limit diversity of exposure (Sørensen & Hutchinson, 2018). Early critiques warned of the potential for filter bubbles (Pariser, 2011) and echo chambers (Sunstein, 2018), which could foster user complacency and weaken the public sphere. However, recent research on recommender systems has challenged these assumptions, focusing instead on the role of "agency affordances" and user interaction (see, e.g., Möller et al., 2018; Pop Stefanija & Pierson, 2023). Scholars have also explored how algorithms might "support rather than replace human decision-making" (Knijnenburg et al., 2016, p. 13). In the context of PSM, diversity remains a cornerstone of proposals for PS algorithms, with calls for diversity by design (Helberger et al., 2018) and engagement diversity (Hildén, 2021). Although existing literature focuses on algorithms in relation to the normative value of diversity, our research revealed that the PS value of universality – specifically the need for PSM VoD services to have a broad reach – also emerges in discourses about practical implementation. As we will see, the implementation of PS algorithms can sometimes be articulated as a balancing act between fulfilling requirements for universality and diversity.

Transparency is another critical area of discussion. As Sørensen (2020, p. 93) observes, it is "often unclear who controls or performs the personalization", leading to concerns about opaque decision-making processes in algorithmic systems. As socio-technical constructs, these systems shape user experiences through complex interactions, including relational agency (Bucher, 2018). Relatedly, data management and privacy are vital considerations. While these issues affect all service providers, they are especially pressing for PSM, traditionally regarded as "islands of trust" (Sørensen et al., 2020), particularly in Western and Northern European states. As such, PSM must ensure responsible algorithmic practices that prioritise citizen benefit over commercial gain, as well as compliance with broadcasting standards designed to protect viewers.

Through comparative and contextual analyses, we build on previous investigations of emerging algorithmic personalisation strategies at the BBC and VRT (Van den Bulck & Moe, 2017). While both organisations are considered digital pioneers, key differences emerge when applying Donders's five phases of development (2019, pp. 1013-1014). Specifically, we position the BBC in the "mature" phase of its PSM digital development, whereas VRT transitions between the "expansionist" and "consolidation" phases, balancing efforts to expand its online presence with internal reorganisation and a greater focus on distribution. Although existing studies have examined forms and levels of personalisation on PSM VoD interfaces (see Álvarez et al., 2020; Iordache & Raats, 2023; Kelly & Sørensen, 2021), questions persist about the design and strategic underpinnings of these systems. Our study expands this body of work by exploring how PS algorithms are developed in practice and how PSM organisations embed public values into their recommender systems.

Methodology

The study investigates how PS algorithms are developed in practice and how their implementation is guided by the remit of two PSM organisations: BBC in the UK and VRT in Flanders, the Dutch-speaking community of Belgium. The purpose of this comparison is descriptive and explanatory (Vliegenthart, 2012), both detailing differences between the organisations' practices and seeking to explain relationships between regulation, market contexts, and organisational agency in developing PS algorithms. Case study designs are well suited to this approach because, as Flyvbjerg (2006) argues, they offer a closer perspective on the complex and context-dependent nature of processes as they unfold. Such designs emphasise empirical knowledge which can nevertheless, through subsequent recontextualisation within and across studies, contribute to generalisable theory.

Prioritising empirical insight, our case selection is necessitated by the nascence of PS algorithms as they are being implemented, with few organisational cases to draw from on a global scale. VRT and the BBC both fit within an arrangement of PSM associated with Northern Europe, with broad government intervention into media, strong funding, and generally high levels of trust (Moe & Syvertsen, 2009). Unsurprisingly, this arrangement dominates digital innovation among PSM, particularly in the implementation of algorithmic curation (Van den Bulck et al., 2018; Van den Bulck & Moe, 2017).

These similarities provide a broad frame for comparison, but our research avoids a media systems approach to understanding PS algorithms. Recent studies of PSM innovation and digital development have emphasised the limited relevance of Hallin and Mancini's (2004) typology of media systems for explaining how specific PSM organisations develop digital strategy and the decision-making governing the implementation of new technologies (Direito-Rebollal & Donders, 2022; Sørensen & Van den Bulck, 2020). As D'Arma et al. (2021) argue, the repositioning of PSM towards online delivery is heavily impacted by nationally specific factors that can differ widely among media markets,

even within Northern Europe. These factors are crucial for understanding our own case studies of VRT and the BBC. Table 1 illustrates several differences at the level of language, audience reach, funding, and organisation size. Broadly, we can describe a comparison between VRT, an institution providing for a small market but with clear policy directives for technological support, and the BBC, a large-scale broadcaster with significant funding for digital innovation but no external guidance on the implementation of algorithms. Finally, these cases are also distinguished by the pure level of personalisation employed within the VoD, with the BBC's iPlayer exhibiting a stronger personalised offer to users than VRT MAX (Bruun et al., 2025). Nevertheless, our study examines how these contextual, organisational, and strategic differences affected the broadcasters' implementation of a PS algorithm design for their services.

	VRT (Flanders)	BBC (UK)
Population (million)	6.82	68.35
Language of services	Dutch	English
VoD service - released	VRT NU 2017-2022 VRT MAX 2022-present	iPlayer 2007-present
Number of personnel (PSB and commercial)	1,880	21,319
Total revenue (€1, thousand)	497.6	6,533.9
Funding (€1, thousand)	Government financing (59.9%): 297.9 Commercial and non-commercial activities (40.1%): 199.7	Licence Fee (68%): 4,437.3 Commercial and non-commercial activities (32%): 2,096.5
Percentage of population reached across services (weekly)	90%	85%
Broadcast market share	41%	32.3%
VoD reach (million)	1.6 (annual)	14.1 (active weekly)
Netflix reach (percentage of population)	48%	67.3%
Mandatory sign-in	Yes, for on-demand content; Live also available without sign-in	Yes

Table 1. Market contexts of VRT and BBC. Sources: Various company and industry reports; information correct to 2023.

First, we conducted a close reading of policy and strategy documents (Karppinen & Moe, 2019), to identify the PSM's regulatory requirements, their remit, and the priorities of their digital strategies. The documents included broadcast contracts and licences, which

contain formal obligations, and annual reports of PSM practices and strategy. Secondly, we conducted 18 qualitative semi-structured interviews (Van Audenhove & Donders, 2019) with 16 key PSM representatives (see Table 2). The respondents were all involved in various aspects pertaining to the running and strategy of the VoD portal, as well as the development and implementation of algorithmic recommenders. However, the differences between the two organisations influenced the departments targeted and the respondents' level of seniority.

For the purposes of this article, the responses have been semi-anonymised by indicating the job title of each informant, in order to comply with data protection and ethics requirements in the context of comparative analysis. The interviews were conducted in the spring and summer of 2024, lasted between 45-90 minutes, and took place either in person or online. The interviews were transcribed verbatim, coded, and analysed by the authors according to a systematic comparative framework. The informants provided us with valuable context for the development and implementation of algorithmic recommenders and unique insights into the organisational processes of digitalisation and data-informed decision-making. Quotes from the documents and interviews were translated by the authors, when not originally in English.

Job title	PSM	Interview date(s), 2024
Director, iPlayer and Channels	BBC	30 April
Chief Product Officer	BBC	3 May
Controller, Policy	BBC	29 April
Director, Strategy & Performance	BBC	10 May
Lead Data Scientist (Recommenders)	BBC	29 April
Editorial Lead (Recommenders)	BBC	29 April, 9 May
Director of Distribution & Business Development	BBC	29 April
Head of Digital Media	BBC	31 May
Channel Manager VRT1 & Canvas	VRT	16 July
Director Connection	VRT	8 July
Director Public Value, Talent & Organisation	VRT	9 July
Director Technology & Infrastructure	VRT	5 August
Head of Fiction	VRT	24 May
Manager VRT MAX	VRT	13 March, 10 July
Market Research Advisor	VRT	10 July
Head of Study Department	VRT	10 July

Table 2. PSM representatives interviewed for this study.

Contextual factors: Commercial drivers and policy requirements

Although PSM are highly regulated and subject to specific policy requirements, they are not immune from commercial concerns, nor can they function entirely separately from commercial streamers and audience expectations online (Johnson & Dempsey, 2024). PSM strategy documents point to the challenge of having to balance or even choose between what seem to be competing aims, namely meeting the public remit and gaining and retaining audiences (Iordache et al., 2024). However, the ways in which market contexts combine with policy requirements to shape how PS algorithms are developed differs between VRT and the BBC.

In Flanders, the focus on building diversity into recommender systems comes from specific regulatory requirements laid down in the management contract signed with the Flemish Government. VRT is mandated to define, develop, and continuously assess a recommender system that broadens audience tastes, stimulating diversity and serendipity of media use (Vlaamse Gemenschap & VRT, 2020). In 2022, VRT re-launched their VoD service VRT NU as VRT MAX, with the aim of rebranding it as a standalone service, and not just a catch-up platform. The launch of VRT MAX enhanced the focus on developing an appropriate method to measure taste, and therefore taste-broadening. The resulting metric was a "taste score", calculated based on how widely a user's consumption on VRT MAX was distributed across a fixed group of categories, primarily genre-based (Prato, 2023). The higher the score, the broader the diversity of content consumption, as discussed in more detail in the next section.

According to a recent review conducted by the media regulator VRM, "the various initiatives around curation and personalisation, although still experimental, have clear results. This is evident from automated measurements that were built in" (VRM, 2023, p. 35). The review notes that, between September-December 2022, the taste score doubled among the group of users who had a low taste score at the launch of VRT MAX. Nevertheless, the review also indicated that manual taste-broadening, applied through editorial curation, also contributed to increasing user taste scores. VRT added that "the taste score is not stable throughout the year. We learn a lot from the tests we do and adjust our approach accordingly" (VRT, 2023, p. 46).

Users' personal data and their consumption history are central to the successful development and implementation of recommender systems. User registration and login have been required to watch on-demand content since the launch of VRT NU in 2017. Users can enter, change, and manage their user data in their profiles, as well as set up parental controls for children's profiles. As the use of user data and a mandatory login could jeopardise universality, VRT's strategy oscillates between concerns for accountability and the pressure of competition with foreign streamers. The VRT Management Contract for 2021-2025 tasks the PSM with being transparent with audiences about the use and nature of the recommendation algorithms deployed, as well as offering them a user-friendly portal to consult and manage their data (Vlaamse Gemenschap & VRT, 2020). The regula-

tor found that both of these key performance indicators were achieved in 2022 through VRT's online communication, a strategy developed based on a consultation with academic research that was rolled-out in 2023, and VRT's public statements (VRM, 2023).

In our interviews, VRT representatives stressed the importance of providing users with the personalised experiences they have learned to expect based on standards established mainly by commercial streamers. In this context, they highlighted the need for user data, not only to navigate the affordances of on-demand delivery, which requires a new form of curation, but also to reach their public service mission, both by providing users with public service content and diversifying their content exposure. Moreover, they indicate the difficulty in simultaneously implementing algorithms with different aims, and a tension between market and public service requirements. Stronger personalisation is perceived as necessary to gain and retain audiences. However, the taste-broadening obligation is seen by some of VRT's data analysts as a potential obstacle to obtaining a truly effective recommender system which, although in line with the public remit, may lead to lower audience gratification. As indicated by a VRT Market Research Advisor, the balancing act is "very tricky", as,

> [...] it would be much easier if we were a commercial organisation, we would just create a quite simple algorithm, give you more of the same and know you will be watching. But because this taste-broadening is included, it's much more difficult to get a strongly performing algorithm, and what we are used to from, for example, Netflix.

VRT indicated that in 2021 they "experimented with introducing explanatory labels to specific offerings" (VRT, 2022, p. 45). They relied on "new insights into the possible operation of a public broadcasting algorithm […] to explain this even better to the media user" (VRT, 2023, p. 47), by updating and further expanding the text in the privacy policy with more information on the design, operation, and monitoring of the algorithm. In 2023, VRT also collaborated on the design of the Solid4Media project (solid4media.eu/), which aims to provide users with enhanced transparency on the data used by VRT for personalisation. VRT indicated that "maximum privacy of user data is assured" (VRT, 2023, p. 47) and provided some general information on how the data was managed. Nevertheless, the VRT MAX Manager noted that they "had to and wanted to" become much more transparent about the use of algorithms and clearly indicate to users in the future why they were recommended specific content.

Comparatively, discussions of, and specific requirements regarding, PSM's use of algorithms are absent from UK policy and regulation. However, they have become increasingly present within BBC's own strategic discourses. As part of its "BBC For The Future" strategy, the broadcaster highlights PS algorithms as a key element in its ongoing digital transformation, stating a commitment to designing algorithms that "will not simply serve audiences the sorts of content they already consume, but will introduce them to different types of content […] algorithms will be built around values of impartiality, breadth and

depth" (BBC, 2024, p. 19). For the BBC, PS algorithms are imagined as capable of both driving personalised viewing and fulfilling a range of core public purposes.

However, in our interviews, the potential trade-offs between the different aspirations in the BBC's strategy documents came to the fore. As with VRT, personalisation was seen as essential for meeting audience expectations, understood to derive largely from users' experiences of commercial streaming services. However, while VRT actively uses algorithms to "push" a diversity of content, designing diversity into the algorithm was positioned by the BBC as potentially off-putting for audiences. As the BBC's Director for iPlayer and Channels claimed,

> [...] we have to be real to the use of algorithms because if we don't then others who use algorithms cleverly will mean that we look out-dated and non-personalised and that we're trying too hard to push certain things to people.

Market imperatives were reiterated by the Chief Product Officer, who claimed that broadening diversity of consumption was secondary to the primary job of personalisation, which was to "drive growth" in use of the BBC's services:

> The algorithm really should be focused around finding out what you like and making sure that you can access that, because that's how we demonstrate that there is value for you on the BBC. Once we have demonstrated that and kind of earned our place, then we're looking at breadth really because that's the point at which we want to be able to show, firstly, there's more to the BBC than maybe you previously thought, but secondly, we want to make sure that you're not trapped in any particular space.

Here, aping the use of algorithms by commercial competitors to provide users with what they like is justified through reference to the BBC's mission to "serve all audiences" (BBC, n.d.). In effect, the BBC's remit for universality is being evoked to justify the employment of algorithms to grow use of iPlayer. Yet this is positioned as being in tension with the BBC's public purpose to "serve the diverse communities" of the UK, reflecting a broader tendency that has been acknowledged in normative literature between requirements for "universality" and "diversity" within PS remits (Horowitz & Lowe, 2020; Savage et al., 2020). Indeed, the Chief Product Officer's definition of a PS algorithm was one that balanced provision of what users want in order to achieve universal use of iPlayer with broadening diversity of consumption: "When I think about a public service algorithm, that's what I'm thinking about is around that trade-off between growth and breadth".

This trade-off emerged across our interviews, as respondents sought to resolve a tension between universality and diversity as core PS requirements for the BBC. For example, the BBC's Controller of Policy argued:

> I don't think the idea that you can offer a personalised service for someone negates the idea that you can still create those big moments where people come together, and indeed

> if part of universality is offering something to everyone, and being able to offer that diversity of views and being able to offer a service that allows the country to see itself reflected back, personalisation is a very powerful way of doing that.

Here, personalisation is positioned as a tool for bringing audiences together *and* ensuring that the BBC offers programming that meets the diverse needs of all viewers. This was reiterated by the BBC's Editorial Lead (for Recommenders), who argued that personalisation enabled the BBC to surface different facets of its catalogue, which was more varied than commercial streamers. Mirroring some of the rhetoric around taste-broadening algorithms at VRT, here, personalisation was positioned as a vital tool for introducing audiences to the diversity of content within the BBC's catalogue.

As with debates about the use of algorithms, questions of data transparency by PSM have also been absent within policy debates in the UK, and it has been left up to the organisations to develop their own strategies, beyond broader legal imperatives such as the General Data Protection Regulation. The BBC introduced a mandatory sign-in for iPlayer in 2017, requiring users to create an account and provide personal information, such as postcode and date of birth, to view content. The BBC justified this decision by arguing that it was not possible to develop a personalised service nor effectively measure the universality of usage without a sign-in (Boaden, 2016). As the BBC continues to compete with the user interfaces of commercial services, sophisticated user data has become increasingly necessary for maintaining reach. The organisation's Head of Digital Media referred to the importance of understanding the habits of lighter "less than weekly" users through tracking their "implicit actions" across the BBC's services – from articles they read on BBC News to the programmes they watch on iPlayer – to develop more accurate recommendations. However, as with the use of algorithmic personalisation, the BBC seeks to balance the market pressures for collecting user data with its broader public purposes. Our interviewees were keen to stress that the BBC took a principles-based approach to the use of data that aligned with an established data governance framework. The BBC's Privacy Promise marks three key principles of data "transparency", "choice", and "trust", which the Chief Product Officer echoed by stating that "we will only collect the minimum amount of data, we're never going to resell your data to anybody, we don't use your data for commercial purposes". These principles extended to decisions about what kinds of data were used to underpin algorithmic recommenders. The Lead Data Scientist (for Recommenders) argued that, so far, the BBC only used data on previous interactions in its recommendation algorithms. Socio-demographic data, and in particular, data on gender, was not used due to risk of "biasing our recommenders more than they might already be".

In sum, despite the very different policy contexts in the UK and Flanders, we see similar challenges within each PSM to balance market imperatives and public service remits. The policy requirement for VRT to create a taste-broadening algorithm does not mean that VRT is immune from market pressures and audience expectations shaped by the experience of commercial streamers. And while the BBC has developed its algorithms

relatively free of policy intervention and regulatory scrutiny, its rhetorical approach to algorithms exhibits a similar attempt to negotiate the corporation's public purposes and the need to drive growth of its services in the face of increased competition from commercial players. Perhaps due to the absence of a clear policy direction, this dynamic was often framed not as a direct tension between market and public service pressures, but as the need to navigate between two competing components of its PS remit: universality, interpreted as strategies to boost audience use and retention, and diversity, defined as encouraging broader content engagement. In both contexts, this emerged as a balancing act between the need to increase reach and engage audiences with a diverse array of content. The following section examines how these priorities are operationalised within each PSM.

Implementation: Where algorithms meet editorial

The development of PS algorithms at both the BBC and VRT involves a close integration of editorial and data science teams. On the one hand, editorial insight influences the design and evaluation of algorithms, as machine curation starts from understanding how editors select and label content. On the other hand, curation and algorithmic recommendations work very closely together, as editors continue to decide how and where the recommenders are placed on the different pages or decks.

VRT works in what it terms an "algotorial" system that closely combines algorithmic and editorial curation. At the beginning of 2024, PSM informants indicated that the VoD service consisted of an almost even split between the two. However, in our most recent interview, the VRT MAX Manager indicated that editorial curation had gone up in the meantime due to the ongoing closing down of radio websites and their integration into the portal, leading to more content that was manually curated. Several informants highlighted that continued editorial curation was instrumental in ensuring VRT's public mission, by deciding where the algorithms are placed, which decks are personalised, and the degree to which offerings are algorithmically curated:

> I'm a very strong believer that this is the way for us as a public broadcaster and as a platform of a public broadcaster. I'm quite principled about that one. I will never hand over VRT MAX 100% to the algorithms […], because the algorithm doesn't always know or doesn't always have a way to know which are the main stories that VRT wants to push towards society (Manager VRT MAX).

The VRT MAX team works with three categories of content: hero, targeted, and inventory. Hero content consists of projects that are important for VRT and made prominent through placement in the hero-board. This is content that is considered important to the general Flemish audience by VRT MAX editors. From October 2024, the editorial curation of hero content has been complemented by a "bandit algorithm", which adapts the

banner according to contextual information, such as time of day or device used to access the app. Targeted content is produced and distributed with specific audience groups or needs in mind, and, once the target is defined by the editorial team, it is primarily distributed through algorithmic curation. Inventory content is not pushed or promoted on the portal, generally because it consists of titles that are already popular with audiences who know where to find them (e.g., news, current affairs, long-running soaps). The curation team for VRT MAX consisted of approximately ten people at the time of writing, but the manager had asked the VRT Board of Directors to double it, pointing out that editorial curation was still an essential part of VoD curation and the team worked around the clock, in shifts, to ensure continuity on the portal.

The algorithms used by VRT are developed in-house and are aimed at both personalisation and taste-broadening. The former builds on collaborative filtering and aims to meet user expectations for "a better experience and a more personalised experience […] to make sure that they use more content, that they come more frequently" (Director Connection, VRT). This is based on defining and meeting user "needs" through occasion-based segmentation:

> We start from the fundamental needs people have. Do you want to stay up-to-date with what is happening in the world around you? Do you want to escape the daily reality of life? Do you want to have a good laugh with your friends and family? […] Are you just killing some time waiting for a bus? And then once we have the fundamental need we try to include the specific context. Were you alone? Were you with other people? Where were you? Which devices were you able to access? What time of day was it? (Market Research Advisor, VRT).

The algorithm stems from a set of content categories chosen by VRT MAX editors, generally genre-driven, but also related to a specific theme or media personality. "Taste" indicates how uniformly the consumption behaviour of an (anonymised) media consumer is distributed across a fixed group of six categories. The taste score is 0 when they only consume offerings from one content category (e.g., fiction) and 100 when the consumption behaviour is evenly spread across the selection of all offering categories (VRT, 2023). The latter is used as an indicator of exposure diversity, which VRT MAX aims to raise through so-called "1:1 taste-making", which provides gentle nudging, but remains in line with user preferences (Prato, 2023).

VRT has invested significant financial and human resources in developing and fine-tuning its algorithms. VRT has praised the societal benefits of the taste-broadening strategy (see Prato, 2023; VRT, 2023), and the media regulator has positively assessed its application (VRM, 2023). However, in a recent follow-up interview, the VRT MAX Manager also wondered about its prospects:

> I think we are struggling a bit with […] the next step when it comes to taste-broadening. […] I also noticed that my colleagues at the data and intelligence team aren't talking a lot anymore about the taste-broadening algorithm because it's in place, it's doing its job, but we have other priorities nowadays together.

A potential answer to that question may involve the development of a more complex strategy that weighs the content recommended based on its potential public value. Nevertheless, this system would continue to rely on editorial input, as algorithms would be programmed to follow a hierarchy designed by VRT staff:

> By valuing public service content more and proposing it more to different cluster groups, I think we can accelerate the taste-broadening. […] For instance, if we [have] a sports program where you see the social impact of sports on community building [...], now it has the same value in our algorithms as a football match. But I think we have to score that kind of content higher (Director Connection, VRT).

As with VRT, the BBC develops its algorithms in-house and editorial staff are embedded into recommender teams such that editorial insight informs all aspects of the development of recommender systems. As the BBC Editorial Lead (for Recommenders) stated, "when something is being used to curate or display or otherwise create an editorial experience, it has to have an editorial person overseeing it". A crucial part of editorial's role in the design of algorithmic recommender systems is ensuring alignment with the BBC's public purposes and compliance with the Broadcasting Code, as enforced by the regulator Ofcom, which establishes standards for all television programming broadcast in the UK in relation to issues such as due impartiality and accuracy, harm and offense, and the protection of children (Ofcom, 2020). Although there is no policy requirement for the BBC to apply the Broadcasting Code to its digital services, our interviews suggested that it acted as an internal regulatory framework that shaped the design of recommender algorithms.

This internal regulatory framework is crystalised around a set of "business rules" built into recommender algorithms and described by the Editorial Lead (for Recommenders) as follows:

> Business rules use various signals from the data that acts as a filter in the algorithm. [...] it could be things like amplifying certain pieces of content, blocking old content, down-weighting certain things so that they only show when they're super-relevant. So, things like suicide, self-harm, eating disorders, we don't want to exclude that, but at the same time, you only want it to appear when it's very relevant and appropriate.

Business rules are designed to facilitate protection from harmful or inappropriate content for users, but can equally be used to push content that the BBC wants to prioritise (which might be more diverse content, but could equally be more popular content) or block the content that it doesn't want to prioritise. In this regard, editorial interests are built into

algorithmic recommenders to enable the algorithm to fulfil a range of functions – from driving viewership to managing reputational risk to protecting audiences from harm.

Editorial also controls the order of the decks on iPlayer. According to the Lead Data Scientist (for Recommenders), only a few of the decks are entirely algorithmically determined, such as those that offer content "Recommended for you" or "If you liked", which are based on "a content-to-content algorithm and personalised collaborative filtering". Others involve some combination of editorial and algorithmic control. For example, the decks titled "New and Trending" and "Stream Every Episode" contain programmes selected by editorial but ranked by an algorithm based on users' previous interactions on iPlayer. However, much of the iPlayer homepage is entirely editorially curated.

In summary, editorial input remains pivotal in shaping the content selection and ordering of content on the VoD services at both VRT and the BBC, despite their use of algorithmic recommender systems. At both organisations, editorial teams are actively involved in the algorithm design process. At VRT, this is particularly evident in its taste-broadening algorithm, which relies heavily on editorial expertise. While the BBC is not obligated to align its personalisation algorithms with specific regulatory requirements, existing policy frameworks – namely, the BBC's Royal Charter and Operating Licence and the Broadcasting Code – function as the interpretative framework for how the BBC develops algorithms and assesses their value (Piscopo et al., 2024). In this sense, both organisations utilise a "public service algorithm", albeit in different forms. VRT's requirements for taste-broadening place greater emphasis on diversity in the implementation of its recommenders, while the BBC's focus on editorial compliance centres its development of algorithmic personalisation more on questions of impartiality, trust, and reputational risk management.

Reorganisation: Integrating data insights and science teams

At both organisations, the centrality of editorial to the use and design of algorithms has wider implications for organisational structures and working processes. At VRT, data science teams are increasingly integrated within the organisation, potentially reshaping the decision-making process and day-to-day practices of publishers, but also commissioning teams and other departments. As VRT's Director of Public Value, Talent and Organisation indicated, the "digital-first logic is much easier to reach for a new initiative, for a streaming platform or for a startup. But for a company of 1,800 people, that is historically […] based on a linear organisation, it's very difficult".

The VRT Data and Intelligence team is located in the Connection Department, where VRT MAX is managed. Their focus is on data analysis and algorithms, the latter now also being deployed by the VRT News Department, based on the product developed for the VoD service (VRT, 2023). There is also a VRT Study Department, which is under different management and focuses more on qualitative research and linear reach. Although

the two teams collaborate closely, there is still a palpable decentralisation and ongoing process of reorganisation that is looking for ways to integrate the digital strategy more seamlessly under the VRT umbrella, towards reaching the organisation's mission. Content curation continues to be a difficult exercise, as it "has strong implications on the entire media planning of the organisation" (Market Research Advisor, VRT). The VRT MAX team is sometimes questioned about the decisions they make, particularly when it comes to choosing hero content. Space on the landing page is limited, and the integration and placement of content from several linear TV and radio channels, alongside the online exclusive titles, is a challenging task.

The increasing use of data analytics and data-informed decision-making add another layer of complexity. Although VRT MAX still clearly relies on editorial curation, commissioning, and strategy, the respondents also point to potentially different understandings of public value between the editorial team and the data scientists. To this end, the VRT MAX team also includes a dedicated public service person overseeing public value considerations. Thus, the balancing act between data and editorial seems to also permeate collaborations between team members, not only strategy and output. Another example of this is related to providing staff with numerous dashboards and new types of digital metrics: "We include all kinds of data in our dashboarding and we should really invest in increasing data literacy and interpreting the data for more colleagues" (Head of Study Department, VRT). Moreover, there is a notion of imprecision in strategic objectives related to the metrics and audience reach: "I feel like also as an organisation, it's not clear yet, on VRT MAX, when are we happy? Which is the KPI [key performance indicator] that we are really looking at?" (Channel Manager VRT1 and Canvas).

The team working on commissioning and co-production is also working closely with the VRT MAX team. The Head of Fiction was excited about the possibility of using data-informed insights to understand audience reach but still found the discussions on results difficult to have with content creators: "I think that's the most difficult part, that creators say: data, that's your problem".

Although still a work in progress, most of our informants see VRT's enhanced integration of data analytics as a priority. VRT aims to become a more "agile" organisation that can quickly and efficiently adapt to the rapid changes in technology and the media landscape. Nevertheless, there are persistent concerns over clear digital strategy, data-based measurements, and digital literacy skills that may inform decisions on strategy, in-house technological development vs. acquisition of market-developed solutions, and evaluation of success, whether regarding the PS algorithm or VRT MAX as a service.

The BBC is a significantly larger organisation than VRT, with around 17,000 employees within its public service division. And although the BBC is perhaps more advanced than VRT in the transition towards becoming a PSM, our informants painted a picture of an organisation shaped by broadcasting. As the Director of Distribution and Business Development argued:

> At the moment the whole BBC is set up with a broadcast mind-set. I mean we're almost… we're breaking down these barriers as you said, becoming more horizontal. But the way in which, we are set up to do eighteen different versions of BBC1 and so there's very much a scheduling mentality, a scheduling culture and the technology decisions that are made as a result of that, only embed that way of thinking.

As this quote indicates, there are ongoing attempts to better integrate technological and data insight within the organisation. In 2021, the BBC employed a new Chief Product Officer from the tech sector to head up the Product group (responsible for all digital products, including iPlayer) and sit on the BBC's Executive Committee. Central to the Product group has been the introduction of more "agile" ways of working, adopted from the tech sector (Grainge & Johnson, 2015). As the Chief Product Officer described, a linear way of working, in which decisions are made upfront, "doesn't really work with software because it's quite a complex ecosystem and so there's a big shift to moving to agile, where it was iterative, smaller chunks of work being done, managing dependencies and complexities as you go". They went on to describe what this meant on a day-to-day basis:

> We've got cross-functional teams in Product […] we have teams of six to eight and they're multiskilled, and they are working really closely with editorial. So sometimes editorial embed themselves in the teams, other times it's just close collaboration, it kind of depends on the work that we're doing.

As the Lead Data Scientist (for Recommenders) explained, this shift involved the Personalisation team moving,

> […] to a new operating model, structured around capabilities, rather than single BBC products or services. […] On the organisational side, whereas we previously had squads aligned to specific products, such as iPlayer, Sounds, or News/Sport, now we are structured around reusable capabilities, which can be applied to several use cases […] The main advantage of this approach is that every capability can, and should, be easily adapted and deployed to serve multiple BBC products in a shorter amount of time.

Rather than, for example, having the Personalisation team situated within one part of the organisation, this more horizontal structure creates greater flexibility, allowing teams to work across different parts of the organisation dependent on strategic priorities. Although this shift towards a more "agile" organisational structure draws from working practices that originated in tech businesses, there was some resistance from product teams, who would have to cede ownership of their product area. This speaks to a wider friction between "product" and "editorial" that emerged in our interviews. Staff in editorial and product were described as having different attitudes towards risk, such that the Product group might be prepared to launch a new product before editorial teams were comfortable. Meanwhile, for some in the Product group, editorial intervention was seen as "something that slows us down" (Lead Data Scientist, Recommenders).

On the other hand, the long-standing model of collaborative working between editorial and product at the BBC was seen as essential because staff from tech and data science backgrounds were not expected to have the necessary editorial understanding of the BBC's remit. As the Lead Data Scientist (for Recommenders) said,

> [...] the role of the editorial – of embedding the editorial – has been to, first of all, flag any issues that as a data scientist, it's not that I don't need to know about, it's just I don't know about editorial guidelines. I'm interested in those, but it's not my… I don't have the knowledge about those things.

This was particularly important because tech and data science staff in the Product group tended not to come from a PSB context. For the Editorial Lead (for Recommenders), the current shift towards more horizontal and agile ways of working necessitated the need for technologists to have a greater understanding of public service. As she said,

> [...] that's why that business change, like the evangelism that me and my team do, is really important because technologists need to understand public service. And so another change that I think, I hope, will change is that technologists will understand public service in a way that they haven't needed to before because they've been quite distant, but the lines are blurred now so they're going to have to.

In this sense, the greater integration of product and editorial at the BBC does not seem to indicate a shift away from being a fundamentally "editorial" organisation. Across our interviews, the emphasis in discussions of changing working and organisational cultures was on ways of better integrating and inculcating technologists into the value systems of the BBC as a public service organisation, values that ultimately resided within the knowledge and expertise of editorial teams. The emphasis placed on editorial at the BBC may be the result of a lack of external policy framework shaping its use of algorithmic personalisation. Whereas VRT has the specific policy requirements of a taste-broadening algorithm to inform the work of its technologists, at the BBC the responsibility falls to editorial staff to ensure that decisions made by product teams about the development and use of algorithmic personalisation align with its broader public values.

In comparing the two cases, it is important to reflect on the differences at organisational level, including size, financial resources, and managerial structure. Situated at different stages of development with regard to their digital strategy and algorithm use (cf. Donders, 2019), the two PSM organisations are also faced with different challenges and levels of integration of data analytics. In this context, the historical development of the VoD services is also key. Although a pioneer in the VoD landscape, the iPlayer was developed at a time when the broadcast mindset still dominated its structure and priority-setting, ensuring that editorial remained a stable, and arguably powerful, touchstone, which was more recently complemented by business priorities. The more robust integration of editorial may also contribute to its continued legitimacy, while the editorial and curation

decisions at VRT MAX are still questioned by some in the organisation, as the VoD service is establishing itself as a priority in VRT's wider strategy. This not only has implications for its production and distribution strategies, but also its financial planning and human resources. Informants at both PSM organisations also pointed to the importance of editorial staff in understanding the organisation's public service, which may be lacking among data analysts and tech developers.

Conclusion

Our comparative analysis of the strategic developments and the implementation of PS algorithms at the BBC and VRT highlights an ongoing balancing act between public service obligations and market-driven imperatives, as well as the complex and context-dependent nature of algorithmic development within PSM. Both organisations emphasised the challenge of reconciling their public mission with the pressures of market competition in their use, design, and deployment of algorithms. Specifically, the goal of broadening audience tastes (or breadth, in BBC parlance) often conflicts with the use of personalisation to enhance engagement with digital products. This tension reflects the longstanding dichotomy for PSM between promoting diversity and ensuring universality, and may even be intensifying as PSM must work increasingly hard to attract and retain audiences in the digital arena. The challenge, therefore, lies not in the inherent incompatibility of algorithmic personalisation with PS values, but in the broader pressures of operating within a highly competitive media environment dominated by minimally regulated commercial players.

The policy mandate for a taste-broadening algorithm has encouraged VRT to actively promote diversity, a priority less evident at the BBC. The focus on improving users' "taste scores" has not only guided the development of VRT's in-house PS algorithm, but has also influenced organisational discourse on change. In contrast, the BBC has designed algorithms independently, without being subject to regulatory requirements, public debates, or external scrutiny. Consequently, BBC informants prioritised using algorithms to enhance audience engagement with their digital products. However, this does not imply that the BBC's algorithms simply replicated those of commercial competitors. Instead, their development was significantly influenced by concerns about editorial compliance. This concern permeated internal discussions about organisational restructuring, with a strong emphasis on fostering collaboration between editorial and technology teams to ensure that technologists adhered to editorial standards.

An additional challenge lies in determining how the success of PS algorithms should be measured. Unlike commercial platforms, where success is often gauged by metrics such as user retention and engagement, PSM face the unique task of balancing these with normative goals like diversity, impartiality, and universality. However, the absence of standardised or widely agreed-upon metrics raises important questions on whether success

should be evaluated based on increased exposure to diverse content; improved audience satisfaction and trust; adherence to editorial and ethical standards; or various constellations of these considerations.

In reflecting on these dynamics, we suggest that PS algorithms be understood not as fixed constructs, but as evolving tools shaped by technological, organisational, and regulatory contexts. Earlier normative research on this topic, conducted before the widespread adoption of algorithmic personalisation by PSM, emphasised diversity as the core characteristic of a PS algorithm. However, we argue that their development requires ongoing negotiation of values such as diversity, universality, impartiality, and editorial independence, particularly as PSM operate in increasingly platformised media ecosystems. The BBC's use of "business rules" within its recommender systems reveals additional ways in which public values can be embedded into algorithms. These rules reflect values such as protection from harm and offence, as well as impartiality and reputational risk management, prompting a reconsideration of the broader principles that might underpin PS algorithms. As personalisation becomes a common aspect of PSM strategies globally, this reconsideration should incorporate PSM systems that are more moderately and minimally interventionist (Moe & Syvertsen, 2009), and in which innovation is less politically and economically supported. We hope this perspective inspires future empirical and normative research that explores and redefines what constitutes a PS algorithm in theory and practice.

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