‘Datafying’ Broadcasting: Exploring the Role of Big Data and Its Implications for Competing in a Big Data-Driven TV Ecosystem

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Abstract The paper explores the relationship between the concept of “big data” and television broadcasting changing toward a Connected TV ecosystem. We start from the literature-based assumption that big data is a slippery and ambiguously used term and then discuss how the term is employed in different scholarly discourses to explain the changes concerning broadcast television. We infer that the big data phenomenon requires much closer attention to research in media economics in an attempt to advance our theoretical understanding beyond technological issues that server data, social media, rich customer databases and return path data can deliver. We find that analyses into big data can help understand both opportunities and threats of its use with regard to legacy broadcasters trying to add value of audience research in order to achieve competitive advantage. While asking how big data adds value to a broadcaster’s decision on corporate strategies in Connected TV is important, we remain skeptical as to what effectively is to be gleaned from “big data” when methodologies are not transparent and audiences are sold as mere data commodities to advertisers.

1 Introduction: Television in a State of Flux

Television is reaching yet another tipping point in its industry evolution. Driven by the dynamic evolution of information and communication technologies (ICTs), transformations provoked by the convergence between television broadcast and internet broadband allow for the boundary between traditional, linear television

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offerings and the internet based online video content to disappear (Murschetz 2015; also see Jenner 2016; Obrist et al. 2015).

Yet, the issues surrounding structural change in television broadcasting are far from straightforward. The underlying economics are highly complex, but their importance to all stakeholders is evident. The seminal question of who will own the television audience and control the user interface is still an open one (see Murschetz 2015).

One important consideration therein will be the role that traditional or "legacy" broadcasters—private free-to-air (such as Germany's ProSiebenSat1), pay-TV operators such as *Sky*, public service broadcasters (such as ORF in Austria or ARD/ZDF in Germany), will play when being confronted with new competitors from outside the television industry, mainly by *Samsung*, *Amazon, Apple*, *Google*, and *Netflix* (Murschetz 2015). In fact, investments in service improvements and content wealth allow these new players to operate as new TV platform providers to displace TV industry incumbents and offer online video libraries with entire seasons of high-rated TV shows mostly produced by the big Hollywood studios (ibid.). Interestingly, these companies have their origins in completely different industries, like e-commerce, consumer electronics or rental services, with ties to different customer and user pools.

As it stands, it is expected that the traditional television broadcasting networks and their most popular channels can still deliver to large audiences in the future (Murschetz 2015). But, as viewing habits have shifted and digitization has blurred the boundaries between previously distinct access networks and technologies (in media, telecom, and computing), industry architectures and business models used within this converged media "ecosystem" or "environment" (Fuller 2005) are greatly challenged (Murschetz 2015, 2016). Media managers face the need to satisfy the changing expectations of the audiences and incorporate convergence into their competitive strategy portfolio to achieve both economies of scale and scope (Hacklin et al. 2013a; Murschetz 2015).

It is clear that these disruptions encompass issues of technological change and innovation, effects of the convergence on journalism and the newsroom, effects on the industry structure and the competitive behaviour of broadcasters and their new rivals from outside the industry, the ever-more-important changes in audience structures and behaviours, and the creation of public policies to protect consumers (Murschetz 2015; see also Chan-Olmsted and Kang 2003; Doyle 2010; Hacklin 2008; Hacklin et al. 2013a, b; Kind et al. 2009; Wirth 2006).

Certainly, "Connected TV", sometimes referred to as Smart TV or Hybrid TV, is the new buzzword in home entertainment, includes a wide range of technical solutions that bring linear TV and the internet world together (European Parliament 2013). TV sets are with added Internet connectivity, set-top boxes delivering audiovisual content "over-the-top" (OTT), connections are offered to social media and networking services ("Social TV"), and viewers have the ability to interact with gestures and voice commands or use multiple screens ("Multiscreen-TV") for audio-visual communication, etc. (Murschetz 2015).

At the most basic level, viral phenomena such as rating, sharing, liking, retweeting, and other forms of structured and unstructured data sourced from Connected TV platforms, and their affiliated social TV media have created a dialog among programmers, distributors, and broadcasters—and even between artists and the audiences they desire to reach. This represents a huge potential data source for identifying demand through market research (provided that viewers have consented to their data being tracked, saved, and analysed), albeit one that is substantially unmediated and requires intensive processing, analysis, and integration with other data streams to yield meaningful insights. Reed Hastings, CEO and founder of Netflix, for instance, builds business decisions on "informed intuition", i.e., the combination of big data and gut decisions (Ferenstein 2016).

However, not all is rosy. Most of these advantages have major strings attached. For instance, when *Samsung*—the consumer electronics giant and leading provider of Connected TV services—announced that a viewer's personal conversations would be recorded by the device's microphone, it became clear that not only privacy fears were real. Rather, Connected TV is to be associated not only with latest technology, new content wealth, and audience gratifications, but also with underlying industrial strategies of broadcasters collecting mountains of data with powerful and sophisticated analytics tools about their users and audiences. This is to gain competitive advantage in the ever more competitive environment. At the heart of this dilemma—and this is our main issue in this chapter—lies the question of what is to be gleaned from these "big data" repositories that are currently established and curated by broadcasters.

Big data—also called the "next frontier" for innovation (McKinsey 2011) in many industries—is an umbrella term for a variety of strategies and tactics that involve massive data sets, and technologies that make sense out of these mindboggling realms of data. As for the media, Stone (2014) put it succinctly: "The Big Data trend has impacted all industries, including the media industry, as new technologies are being developed to automate and simplify the process of data analysis, and as throngs of data analysts are being trained and hired to meet the demand for the analysis of these data." (p. 2) Yet, the industry can be dramatically reshaped by the insights big data has to offer. Broadcasters, content curators and advertisers can utilize this information and make predictions that will fundamentally change business models and revenue streams (Altimeter 2014; Gfk 2015; McGrath 2013), and, notably, whether this provides a benefit for the audiences or not.

In this chapter, we explore the role of big data and its implications for strategic management of broadcasters and their data-driven corporate strategies to interact with audiences in the emerging Connected TV ecosystem. We argue that the claim that big data is a driving mechanism of media convergence requires much closer scholarly attention to research in media economics at large. Although we identify big data as a core dimension of media convergence, we have scant insight into the conditions in which it is likely to be *economically* consequential for broadcast TV and—even more importantly—for television audiences. We are convinced that media economics can deliver new insights to this to avoid cognitive blind spots and managerial misdiagnosis. Hence, to advance our theoretical understanding of

how big data adds economic value to a broadcaster's convergence strategies, we believe that further research into big data needs to stand the test of contextualization with respect to analyses in media economics.

Second, we also believe that Connected TV delivers a good example for industrial convergence in broadcasting in which we see both established media trying to capture market space and the rise of digitally based companies such as *Amazon*, *Apple*, and *Google* and others as significant content and service providers diversifying into and attacking the traditional TV domain.

Consequently, the primary purpose here is to explore the extent to which analyses into big data can help understand both opportunities and threats of its use with regard to legacy broadcasters trying to make the most of it in order to achieve competitive advantage through product differentiation and audience engagement techniques. In particular, this situation offers an opportunity to examine the strategic efforts of broadcasters by means of big data strategies in order to prevent competitive displacement, thereby reducing the pressure of direct competition from identical products or close substitutes from the new entrants in Connected TV such as *Samsung*, *Netflix* and others (Bakos 1991; Dimmick 2002; Dimmick et al. 2004).

As for methodology, we have reviewed the most topical literature on the transition of the broadcasting television industry and apply insights and evidence from a range of academic and commercial sources to demonstrate that affirmative thinking behind the concept of big data overly simplifies its impact on established media. We triangulated suggestive evidence from various sources: desk research and document analysis in order to collate and synthesize existing research on big data and TV broadcasting.

2 How Will Big Data Impact the TV Industry?

Certainly, debates about the "buzz-word" big data, circle around the key proposition that currently technological means make it possible to track both the viewers and their viewing behavior. A process that is tied to what is elsewhere called "datafication"; the automatized translation of information into quantitative datasets, largely based on material that had not been viewed as information in the past (Mayer-Schönberger and Cukier 2013). Now, when audiences time-shift and "binge"-watch programs, TV companies can trace viewing patterns and learn from them in ways previously unknown. They are able to observe whether audiences grow or shrink after the first few episodes or from season to season and adjust plans accordingly.

Large TV corporations may use big data for a range of projects or initiative. Generally, big data is associated with the analysis of large datasets, originating from different empirical underpinnings (Parks 2014). The sources currently utilized in big data driven research include automated data aggregation and mining, web and mobile analytics, data visualization, sentiment analysis/opinion mining, machine learning,

natural language processing, and computer-assisted content analysis (Buschow et al. 2014; Felt 2016; Freelon 2014; Giglietto and Selva 2014; Mahrt and Scharkow 2013; Mathieu et al. 2016; Scharkow 2013; Trottier 2014; Wagner-Pacifici et al. 2015). Thus, big data includes, but is not limited to, information from actual conversations people have over social media e.g. Twitter, contextual data like the times a specific entry point to e.g. view a series has been used, as well as the sheer number of times a certain term has popped up in the discussion (Chen et al. 2012).

Using this assessment as a starting point for the description of big data outside the academic debate, we follow Stone (2014) and posit that the "media industry can think of big data as the Four Vs, including *volume* of data; *velocity* of data, meaning it needs to be analyzed quickly (especially news); in a *variety* of structured and increasingly unstructured data formats; which all have potential *value* in terms of high quality journalism and business insights and revenue. As this broad argument shows, the term big data lends itself to, but can also be applied to different fields and problems The variety of definitions, tied to the very liberal use of the term by different players in the industry, resulted in the fact that there is no unique definition for big data in the business world and the academia has to define it on a case by case basis (Bughin 2016).

Most working definitions tie it to the IT-infrastructure used to gather data. It is telling that, for example, Bell (2015) stated during a talk at the *Fields Institute* that 'I shall not today further attempt to define big data, but I know it when I see it', before going forward and addressing its impact on modern data analysis, but not limiting him to a certain field or claim associated with it. Indeed, the term big data is commonly used as a catch all term for the opportunities presented by the exponential growth of data in the media sector, including structured, internal data available through media companies' own databases, as well as unstructured data on a multitude of digital channels, including video, audio, photos and reams of social media text" (p. 1, emphasis added). Philip O'Ferrall, Senior Vice President of *Viacom*, later stated: "six months ago we were tied to basic concepts: audience, web traffic or impact of social networks. Now, we have a team of business intelligence directed by a doctor in mathematics. Each statistic we handle allows us to increase value" (O'Ferrall 2015).

One key component for big data in the TV context is the digital trail left by viewers as they flick from channel to channel. This information is invaluable for both broadcasters and advertisers: it reveals the audience's likes and dislikes and allows broadcasters to target their content more accurately (*Royal Television Society* 2016). However, when it comes to informing the creative process in programming, it is still in its infancy. The emerging direct market relationships between audiences and producers (via VOD platforms like *Netflix*, for instance), are, however, starting to change this (Rogers et al. 2002).

3 Competing in a Big Data Driven Broadcast Ecosystem

The challenges of ubiquitous content and connectivity to TV create strategic problems for traditional broadcasters that currently seek to refine or update their business strategy or trying to establish a new business model including Connected TV. Fundamentally, technology-driven convergence processes facilitate business model innovation, which means that the organizations need to reconfigure and reinvent how to create value in this new domain.

However, industry insiders have been quick to grasp that commercial mass media would be struggling to find new revenue streams for the converged-media future. They have proposed different strategy perspectives for organizations (Daidj 2011; Downes and Nunes 2014; Khajeheian 2016).

On this basis, the executives, supported by a fleet of affirmative experts, proposed that the broadcasting industry's future can only be safeguarded by large-scale experiments in product innovation and market development (Dogruel 2013), the invention of new strategies for distribution (such as, for example, the "platform" strategy replacing TV channels), viewers as consumers and their' willingness to share personal data (Evens and Van Damme 2016), monetization activities and the search for new business-models (such as the "Paid-Owned-Earned" strategy described below), and lately, the application and use of big data analytics and its potential impact on company performance (Bughin 2016; Chen et al. 2012; Gfk 2015; McKinsey 2011, 2016).

We estimate the potential for big data and analytics to create value in three specific domains:

- ***Big data as audience analytics tool***. Studies on how broadcasting organizations create value from their ever increasing datasets combined with powerful and sophisticated analytics tools and the challenges they face in doing so show how they minutely capture audiences' viewing habits which allows them to target advertising and to recommend appropriate content (Napoli 2011, 2014; Vidgen 2014). However, the strength of digital technologies, be it social, mobile, big data analytics, or cloud computing—does not lie within these technologies individually. Instead, it consists of how broadcasters integrate them to transform their organizational processes and business models.
- ***Big data as audience engagement strategy***. Rating methodologies, traditional performance indicators, and metrics no longer reflect today's TV reality (Nelson and Webster 2016). Changes in how audiences actively use and engage in television, and the ways in which these behaviours are measured facilitate the transformation of dealing with audience activity. Today, big data is often used to more or less loosely describe techniques, that are understood to "commodify" TV audiences in the digital TV audience marketplace, i.e., to target them more effectively with personalized content in order to optimize advertising revenue (Couldry and Turow 2014; Jennes et al. 2014; Kosterich and Napoli 2015). Instead, applying the right audience metrics as the new "currencies", and tracing audience engagement patterns could be used to better understand sense making processes and emerging protocols.

- ***Big data as business model innovation***: As for television broadcasting and its transition to Connected TV of the future, managers are faced with both the need to satisfy viewers' expectations and needs and the requirement to implement convergence as an industrial strategy. Broadcast TV needs a new business model for a converged future (McGrath 2013). Social media enhancements ("earned media") are ideally suited to complement "paid" (i.e., advertising funded) and "owned" (i.e., any property that a broadcaster can control and is unique to its brand) media revenue models. Big data patterns from social media can help to optimize earned media strategies as the legacy revenue model through paid and owned media has run into difficulties. Paid advertising has found many outlets, atomized into thousands of blogs, Facebook pages, and specialized television and radio stations, so that return on investment is becoming difficult. "Owned media", on its side, is too expensive.

3.1 Big Data as Audience Analytics Tool

Let us begin with an interview by Vidgen (2014) undertaken in the context of a research project on Big Data and television, funded by the EPSRC's NEMODE (*New Economic Models in the Digital Economy,* Network+) program in the United Kingdom. There, a manager responsible for business analytics at a broadcasting organization had to recognize "that data was going to transform all aspects of broadcast, and all elements of broadcast. And part of that was because he saw a big change in viewing behavior from a broadcast type relationship to mass intermediation happening ... [the] consumer starting to watch more on their mobiles and tablets, they have a natural return of data. So, he was absolutely convinced that from a strategic perspective data enabling the organization was going to be key" (p. 11). In fact, developments toward Connected TV are driven by the interplay of the industry's creed in "technology push" and the viewers/users need for "demand pull" in the media. These lines between what is offered ("push") and what is demanded ("pull") are becoming more and more blurred with the continued development of digital media convergence. Data helps to in those cases to give insight into implicit consumer behaviors, creating predictors for consumer behavior that help companies the chance for proactively responding to changes in market environments (Day 2011). For instance, *Netflix* used big data to create its TV shows—recent examples include e.g., *House of Cards, 13 reasons why, Daredevil*) by analyzing and predicting preferences of subscribers, instead of relying on a human decision making process (Erevelles et al. 2016; Bughin 2016). And it is no secret that today big data is rewriting Hollywood scripts that perfectly fit the viewer demand (Bughin 2016; Haughton et al. 2015; Lycett 2013). Recent case studies show that those changes are driven by investments into human resources and software that is based on pattern identification (Bharadwaj et al. 2013).

Still, it has to be stressed that the proposition that convergence would result from a "techno-economic paradigm" (Perez 2010), a term to depict the notion that media

development and change would stem from the constant interplay of technological innovations and entrepreneurial strategy for media to grow profitably, remains problematic or is, at best, speculative, and analyses based on it are not able to give valid inferences.

If it is true that the success of Connected TV shall take place in the consumer's interest, then it is about audiences creating value out of broadcasting rather than the broadcaster's efficient use of big data. Certainly, there is a tension between visions of societal benefit and the industry's use of big data technology that undergirds all viewer interactions with new TV technology. However, as Gillespie (2014) has rightly stressed when analysing the role of algorithms in the digital era, "there are specific implications when we use algorithms to select what is most relevant from a corpus of data composed of traces of our activities, preferences, and expressions" (p. 168). From the perspective of the techno-economic paradigm big data technology comprises the devices, tools, and techniques needed to transform inputs into outputs in a way which enhances the economic performance of the organization (Bughin 2016). As described by Gandhi et al. (2015), "the resulting ecosystem of big data technology is made possible by the evolution of TV application architectures from dedicated hardware-centric functionality to a combination of hardware appliances and modular software services. As a result, big data technologies can support rich, interactive TV experiences by collecting, storing, and analysing federated events and by creating usable information for end-consumers, operators, and programmers" (Gandhi et al. 2015, p. 1). In sum, these technical tools let broadcasters not only capture existing structural and behavioural data, but also predict models for viewing behaviour, monitor cross-media viewing habits, and cross-analyse viewing with purchase behaviour and social media trends. "It also shows them how to schedule programs to lower costs, rev up ratings, and build audience flow; single out the most impressionable viewers and engage them to watch more; target promotional spots to convert more viewers while consuming less airtime; and direct the right ads to the consumers most likely to respond", Dennis Kneale, analyst of *Broadcasting & Cable* (2016) reported.

However, there is more to big data than being a mere tool for audience commodification (Kosterich and Napoli 2015). We also have to ask what audience value is and how big data technologies can contribute to it. Information deriving from big data could be used to enrich audience engagement and user experience, for instance. Cultural studies have long been arguing that audiences make active use of the technologies offered to them to create individual value and meaning. Confronted with a new appliance, individuals develop practices (protocols) that are socio-culturally bound. The *Mobile Phone Appropriation* (MPA) model (Wirth et al. 2008) helps to understand the adoption circle of innovative ICTs and could easily be adapted to Connected-TV. It integrates elements derived from a quantitative perspective on adoption and those from a qualitative perspective on appropriation. The implementation of the latter concept stresses the importance of the social negotiation of meaning within the process of innovation adoption, something which cannot be understood by big data alone. As appropriation is modelled as an active and creative process embedded in the culture of every life, context is crucial

for its understanding. This also includes restrictions of technology appropriation (Wirth et al. 2008). Typically, when it comes to convergent media and the role of big data, privacy issues and data security are felt as key hurdles restricting appropriation.

Communication is a vital part within the appropriation process, both on an interpersonal level and via media. The MPA model highlights the symbolic value of a new ICT like Connected -TV that adds to its use value. Thus, deconstructing symbolic meaning adds context in order to better understand patterns of audience behaviour derived from big data analysis. For instance, if channels and schedules lose their orienting power, other concepts have to fill the void like the reliable content of serials or techniques like ad targeting or personalization using big data and algorithms. The notion of quality TV as meta-genre (i.e., discursively constructed concepts that support selection, frame comprehension, and channel interpretation akin to brands; Schlütz 2016), for instance, helps to explain why the term "quality TV" can work as a USP in market relations where high-quality television series are sold directly to fans as one-off transaction as with as Pay-Per-View (i.e., the consumer pays on demand for a specific show), electronic sell-through (title is downloaded by the viewer) or on subscription.

3.2 Big Data as Audience Engagement Strategy

Broadcasters increasingly realize that television deals in very large amounts of data. From viewing numbers, household data, and television ratings, the ability to analyse large numbers is a necessary and timely advancement. They can see how many minutes of a show a viewer watches, whether they watch a single episode in one sitting, or whether they run through three or four (or more) episodes per night. Netflix, for instance, uses data like this to evaluate their policy to publish whole seasons instead of weekly episodes (Kastrenakes 2015). Thus, broadcasters can now collect a wealth of information from increased viewer engagement that far exceeds traditional ways of data collection. We understand viewer engagement with Askwith (2007; Bobineau 2014) as an overall measure describing both the depth and the nature of an individual's specific investments in a given object (p. 49). Thus, engaged viewers are more prosumers or users than consumers. They create (additional) meaning by engaging with television content in several ways like, for instance, using "paratexts" (i.e., professional or user-generated ancillary content that adds to the sense making process; Gray 2010) and interacting in social media (thereby creating even more data traces). These activities enhance involvement in the text, identification with its characters, participation in follow-up communication, and motivation to seek out similar content. Integrating big data with such contextual information will provide a depth of knowledge that complements current measurements such as ratings (e.g., as with GfK in Germany, Nielsen in the U.S., or BARB in the UK). While those ratings project whole numbers based on a sample, new ways to track engagement and tie data to users on a more granular level will

give both broadcasters and advertisers greater insight (*videa* 2016). It could also be used to better understand audience engagement and its implications for the creation of meaning. None of the traditional dimensions—who, what, where, when, how—are stable or inherently predictable. Big data analysis, derived from Connected-TV viewing behaviour and affiliated social media technology and use, by contrast, combines viewer metadata, device-level data (views, completion of episodes, and whole seasons), distribution-level data (TV, mobile, computer, game consoles, etc.), web traffic data (volume, click-troughs, page views), geo-location (postal code), or data from third-party sources (e.g., TV ratings and credit card data). These data let broadcasters develop personalized relationships with their audiences, which until now have been unimaginable. They are now able to:

- understand how, where and when people are enjoying programming content and services;
- reveal exactly who is accessing which content at what time and where;
- open new channels for personal interaction and dialogue;
- extend influence far beyond existing geographies and target audiences (e.g., to acquire new audiences such as millennials); and
- aggregate individual data for insight and intelligence across platforms (i.e., as input for further programming decisions, new distribution decisions, optimizing programming plans, ad targeting, and real-time marketing).

Again, a fundamental limitation of big data is the lack of contextual data, for instance with regard to attitudinal information. Big data tells you who is watching, but not why, and with what effect. Classic market research—such as panel measurement—alongside return path data (RPD), and social media data will thus retain importance accompanied by qualitative data that aim at understanding individual readings and the sense making process of audience engagement.

So, what does big data do for the audience in order to be attractive? According to the MPA model mentioned above (Wirth et al. 2008), viewers allocate symbolic meaning and value to media that are derived from meta-communication: "Television is not only what producers assemble, nor only the particular text on the screen, nor only what viewers make of it, but consists of all of this: all the institutions and practices that surround, produce, and contextualize those moments, i.e., all that makes the very idea of 'television' meaningful." (Kompare 2011, p. 97) Social media have become an important platform for engaging consumers in meta-communication. The ensuing dialogue among programmers, distributors, and broadcasters, and even between auteurs and their audience add to the sense making process. This is evidently of big interest for the media industry as a whole. And to no surprise McKinsey research shows that they are active in this part field since the beginning of the decade (McKinsey 2016). But once again, it is evident that this only works when a large amount of user data can be generated and for this a critical number of engaged users has to exist (Erevelles et al. 2016; Napoli 2016).

3.3 Big Data as Business Model Innovation

The mass media industry's future will presumably be defined by experiments in monetization. New publishing business models are indeed already evolving. Companies are looking for new revenue streams, while also using cost-cutting strategies as a tool to drive their business toward innovation (Baumann and Hasenpusch 2016; Khajeheian and Friedrichsen 2017; Küng 2017). The advertising and subscription business models that supported traditional media companies in the past, however, appear to fail to do so in the digital age (Khajeheian and Friedrichsen 2017). Addressing this capitalization gap raises the fundamental questions of how commercial media will manage to survive as traditional sources of revenue (paid display ads, subscriptions, and direct sales) shrink (Murschetz 2015). Solving this issue is vital as the legacy revenue model through paid and owned media is starting to fail. We have already discussed that. Consequently, broadcasters look out for other sources of revenue. To that end they develop sophisticated "Social-TV" integration tools that aim at driving viewer tune-in, audience engagement, and loyalty in order to boost ratings, live viewing, and user involvement (Horst et al. 2018; Pardo 2013).

In addition, Social TV apps and multi-screen solutions open new avenues for usage. These apps let users:

- see what their friends are watching and invite them to watch it simultaneously;
- chat, share and tweet around TV programs;
- register through Facebook or Twitter;
- get additional information on anything they see on screen—topics, people—through direct links in the app to Wikipedia, IMDb and others;
- purchase products (i.e., from product placements) and download content (songs, series, books);
- download apps to their mobile phones; and
- interact with the enabled adverts to enter competitions, votings, polls, gaming etc.

Additionally, as a result of these new dynamics, the television industry gains access to another currency: data. The broad range of data traces can be used to inform decisions about programming (i.e., using big data as an input to produce or commission original content that viewers really want), distribution (i.e., data used to evaluate the efficacy of various distribution models), promotion (i.e., data used to identify effective promotion strategies), ad targeting (i.e., allowing digital advertisers to analyze the massive amount of personal data that consumers share, and offer those consumers more personalized and targeted ads for products and services they would use), and business model innovation (see, below). Large data-driven companies, such as *Facebook*, *Twitter*, and *Google*, show how data stimulate the monetization of the digital space: Their platforms track and sell consumer data, thereby increasing the value of the companies with every like, share, search, or post while at the same time violating users' rights by ignoring privacy issues (Brown 2016; Evens and Van Damme 2016). However, from a consumer's point of view

this could still be beneficial, because media organizations could require readers to share personal data instead of charging them for the product. In today's big data era, online platforms, such as Facebook and Google, utilize consumers' personal data to optimize personalized offerings in return for free services. The so-called "datawall" (an analogy with paywalls) secures access to a selection of (free) personalized media content. The datawall business model requires that viewers share personal data with news organizations in order to obtain free access to a particular selection of digital content. However, the datawall's success ultimately rests on consumers' willingness to share personal information, and hence, pay with personal data. Issues of data protection and privacy, however, may undermine consumer acceptance of datawalls and hinder the implementation of big data strategies (Evens 2016; Evens and Van Damme 2016).

4 Conclusion: Impacts on Competition are Unresolved

This paper has sought to interrogate the role of big data as a key driver of change in new television broadcasting ecosystem, and of the social practices and cultural protocols (and their resistance to embracing these, respectively) that emerge in its shadows. Theoretically, we conceptualized some fundamental relationships between the concepts of big data, the media economics of television broadcasting, primarily with regard to the role big data plays in strategizing about the right level of audience engagement.

Given the findings of our discussion, we can reasonably conclude the following: First, it is important to note that big data is not a mere buzz-word to describe the technology and the associated software solutions used broadcasters to dream up viable new business models. Rather, it is a social practice: Audiences employ technology in order to actively influence if not shape television broadcasting (behavior) in their *own* favor. However, while theorizing on "digital traces" itself is subtle and sophisticated, skepticism as to its value for analyzing changes in television broadcasting within the digital marketplace prevails. Ultimately, however, research into "datafying" broadcasting needs to confront this deficit because, as it appears, big data changes broadcasting in ways that may be more beneficial to the industry than to the audiences.

Second, we observed that theoretical conceptualizations on how to contextualize big data remain largely underdeveloped when it comes to the appropriation of ICTs. We therefore view big data as a concept that is in need of much *deeper* theoretical explanation in media economics in order to aid integrating the concepts into a more holistic theoretical assemblage. This will provide a better comprehension of the diverse, interrelated processes at work and the interconnections with human systems of meaning. Furthermore, it can be used to guide models and simulations for predicting long-term trends and possible adaptive strategies of all actors. For the moment, no such model is in sight. It seems to be crucial, however, that such a future model integrated strands from both media economics and audience research

in order to account for the techniques as well as the protocols (i.e., social and cultural practices that are the outcome of viewers' appropriation of a technology) convergent media are comprised of.

And third, when looking into identifying "digital strategies" in new TV broadcasting ecosystems such as Connected TV, much deeper insight into the role of big data and viewer "datafication" as well as audience engagement in changing broadcasting is necessary. Obviously, there is still a lack of critical analysis in media economics research that would go beyond euphoric industry rhetoric and challenge notions of viewers as commodities. Analyses into direct, unmediated market relations between broadcasters and audiences are a first step in this direction (Rogers et al. 2002). For now, much of the rhetoric of big data contains no meaningful analysis of its potential perils, only the promise of the glass consumer. Recognizing this key paradox of big data, i.e., showing its perils alongside its potential, will help us to better grasp the concept and the theoretical and empirical consequences.

And, finally, we confirm that it is very important to make the right strategic decisions in order to be economically successful. Legacy broadcasters may easily be 'stuck in the middle' and offer products to the mass market while missing out high margins in the niche segments. Big data can, however, well help providing new insights into these niches.

To conclude, we wish to stress one last important factor: analysing the role of "datafication" within the context of television broadcast media should include its implications for television as the most influential democratic mass medium in society. Further research into big data and its role for changing broadcast television needs to recognize this fundamental ingredient: that television should primarily serve the audiences who are supposed to actively shaping their own media future.

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