MANAGING THE DIGITAL TRANSFORMATION OF THE BROADCASTING INDUSTRY WITH BIG DATA

BIG DATA'S IMPACT ON CONTENT IN THE DUTCH BROADCASTING INDUSTRY

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ABSTRACT

Due to technological advances, the global broadcasting industry is in the midst of a digital transformation. The factors that caused it, changing consumer behavior, the diversification of communication channels, and new market entrants, have threatened traditional players in their existence. For their fight for survival in this insecure environment, big data offer remedy: They present predictability and stability and presumably shine the light through an impenetrable world that is taken over by companies that do not consist of creativity but technology. To defy those tech giants, traditional broadcasting companies do not only develop digital products and new business models that revolve around data, they also lean towards big data analytics to see how they can differentiate themselves from their new competitors in terms of content.

With Netflix setting first examples, the implications of data-driven content for creativity have been discussed fiercely within the industry. Academics, however, rather point out the limitations of big data analytics, such as possible biases, and their cultural implications. Yet, little has been said about current and future possibilities of data-driven content. Furthermore, not much knowledge exists about how big data change organizational processes within media companies and production processes of creative products. Therefore, this work researches the Dutch broadcasting industry's application of big data for decision-making about content and answers the question how companies in the Dutch TV broadcasting industry use data and what are their intentions are regarding its possible application for content. 16 interviews with media experts in the field of data, production and decision making were conducted and served as the basis for a latent thematic analysis.

The findings draw a detailed picture of current developments and suggest that big data analytics are seen as the solution for the industry's struggle and perceived as highly beneficial for content. While the research revealed different levels of big data application for content between public and commercial broadcasters, the overall adoption of big data for content remains low and suggests a non-intrusive usage of big data analytics that traces back to isomorphic tendencies. The little interference of big data with creative processes as currently prevalent in the market shows the resistance of the required fundamental change. The main reason for this was detected to be a lack of managerial vision and skill sets to change existing routines and make data actionable. Overall, the development of a clear direction and strategic approach of traditional players within the broadcasting market is yet to come.

KEYWORDS: *big data, broadcasting, content, data-driven, digital transformation*

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[PREFACE]

I remember this slightly panicky feeling during the course 'Media and Business Transformations' held by Dr. Payal Arora when I realized the whole dimension of the dominance of the tech giants. If data are the means by which our world is controlled today, it's those companies that sit in the control rooms. This realization combined with my previous experience at Pinterest, a company that is driven by activating people to become creative and try out new things with the means of data-driven content discovery, made me interested in the implications of the dominance of technology companies and the hype around data for content providers.

With Media Perspectives and Frank Visser, I found a strong partner for the exploration of this topic in the course of my master thesis. My thank goes to Frank for not only providing me with insights into the current challenges of the Dutch broadcasting industry in this regard but also for introducing me to a variety of experts in the field and giving me the opportunity to speak about my topic at the Cross Media Café in Hilversum. The interviews I conducted were rich in insights and very inspirational. Therefore, I would not only like to thank my interview partners for making time to talk to me, but also for doing so in a very open and honest manner and convincing me of the potential that the industry has to offer. And, of course, a big thank you also goes to my supervisor Dr. Erik Hitters, who offered his perspective on the topic at a variety of occasions and guided me through the process of writing this paper.

1. Big data and the digitization of the broadcasting industry

Back in 2000, Rawolle and Hess noted that "traditional media companies are under pressure to exploit upcoming technologies before newcomers or companies from the IT-industry break into their established markets" (p. 98). This warning seems to be left unheard by the broadcasting industry because over the past two decades, the development of new technology and the rise of online distribution has disrupted the TV broadcasting markets worldwide. Competitive pressure is built up by online video services that gained popularity with audiences and fragmented their media usage. These platforms are catch-up, advertising supported, or subscription services such as YouTube, iTunes, Netflix or Amazon Prime (Doyle, 2016).

Due to these changes in consumer behaviors and the multiplication of communication channels, "industry architecture and business models in the broadcasting industry are being increasingly transformed" (Evens, 2010, p. 41). Broadcasters are seriously challenged in their core practices: Audiences move into the digital space, threatening long-established players to become less relevant for them. For decades, a broadcast's success was – at least partly – judged upon viewing numbers. They proved the relevance of public broadcasters for the public and were the lifeline of commercial broadcasters, whose business model traditionally depended on advertisements. The simple formula – the higher the viewing rates, the higher the advertising revenue – still holds true today, but within the last years, advertising revenues of the traditional channels such as analog TV dropped dramatically (Couldry & Turow, 2014).

To reach the audiences they depend on, broadcasters shifted their efforts from content scheduling to content providing (Evens, 2010) and therefore expanded their portfolio, created new online platforms and communication channels, and entered a battle for audience impressions. With new technologies offering the possibility to track consumers' behavior and collect their data throughout various channels, but also the need to develop "long-tail based business models" (Evens, 2010. p. 49), big data recently arose the interest of the broadcasting industry. The reason for this new approach might be that it "promises more stability, perhaps even predictability, for an industry typically characterized by risk and uncertainty" (Kelly, 2017, p. 3).

1.1. The promises of big data

As an enabler for organizations to pursue their digital transformation (Lippel, 2016), big data do not only dominate the current technology discourse (Napoli, 2014) as it is carried out in scientific publications and the media, but also the debates held in the broadcasting landscape. Media companies, especially broadcasting companies, have always generated

and worked with data (Lippel, 2016). Methods such as audience testing, ratings, or eye tracking (Hallinan & Striphas, 2016) have been used to generate insights about the audiences' perceptions of programs. As "an integral part of televisual culture" (Kelly, 2017, p. 3) the phenomenon is often discussed as pure opportunity (boyd and Crawford, 2012). It is advocated because of its capability to facilitate content distribution and to monitor content consumption. Since a lot of media distribution processes are trying to become more data-driven, firms are also enabled to deliver personalized and customized content (Carah, 2017). This content is assessed to have the potential to be highly relevant for its target group (Evans, 2017) and therefore helps companies to reach their consumers in a purposive way. Media consumption is automated with the help of algorithms (Napoli, 2014) and the data they process is thought to offer "a new kind of access to human experiences, relations and social activities" (McCosker & Wilken, 2014, p. 156). That is why researchers and practitioners see big data analysis as a promising practice, if not the holy grail (van Dijk, 2014) for companies to gain behavioral knowledge that helps them to differentiate themselves from their competition (Morris, 2015).

In today's business world, more data are associated with more value. This is partly due to the fact that the success of US tech firms such as Google, Facebook, or Amazon is mainly based on their great quantity of data, letting them lead the markets they operate in (Özköse et al, 2015). These companies are highly innovative because of their skillful use of new data management technologies and analytics that make it possible for them to integrate data into their business processes (Gandomi & Haider, 2015). Because these tech firms entered the traditional media markets, algorithmic technology and its implementation into business strategies also gained an increasingly important role in different decision-making contexts of the media industry as a whole (Napoli, 2014). However, it is not clear yet whether broadcasting companies focus on this trend due to "a fear of being left behind" or due to "a genuine belief that big data can have a positive creative and cultural impact" (Kelly, 2017, p. 3).

1.2. The discourse around big data and content

Clearly, there exist different functions of big data within media operations. Big data help to address target groups more precisely and avoid scattering effects and therefore make marketing strategies derived out of big data insights look like the future (García-Arista, 2016). Additionally, they gain more and more importance for media production, where knowledge derived from big data now serves as a decisive aspect (Napoli, 2014). However, within the production processes of creative content, it is not sure yet what role big data are going to or should play. Cases such as the Netflix series House of Cards, where the creative direction is said to have been based on big data insights (Atchison & Burby, 2016), were used to discuss

the success of such an approach. With the help of big data, the streaming service claims to have been able to proactively predict what their users would want to watch in the future. After looking at what shows had done well in the past, they supposedly were able to identify correlations such as: "Users of our service who like David Fincher also like Kevin Spacey" and based their decisions on production processes on these insights.

But is big data analysis really „fueling creative idea generation" (Evans, 2017, para. 11)? After all, this development brings along a shift of power, where the role of humans in the creation of media content develops to be an indirect one (Napoli, 2014), affecting their degree of creative freedom. Cases such as House of Cards are critically assessed and sparked a debate about consequences for creative quality and diversity of such content creation strategies. The question of how much in-depth information can be read out of data and how much companies engaged in creative processes should trust data over expertise is put in the center of the ongoing discourse. Voices that take a rather critical standpoint on the use of big data for content creation point out that data retrieved from "online actions such as clicks, links, and retweets are complex social interactions with varying meanings, logics and implications" (Tufekci, 2014) and can easily be misread. House of Cards, for example, has been described as „a product of logic and algorithms as opposed to tradition and instinct" (Carr, 2013). Admittedly, big data analytics might be – as it is claimed in the case of Netflix – a helpful „multipurpose toolbox" (Garcia-Arista, 2016, para. 3) but researchers insist on it not being a replacement of creators' expertise (Mishra, Yadav & the Deep-Play Research Group, 2013).

1.3. Implementation of big data analytics in traditional media companies

The notion about the importance of big data and the discourse around products such as House of Cards stands in strong contrast to the actual implementation of big data practices in many traditional media firms. A look at the current use of big data in the media industry reveals that companies often fail to or are very slow at adopting the technology that would make real insights possible (García-Arista, 2016). The same applies to an innovative form of content distribution or content creation. The fact that many companies face a lack of knowledge when it comes to collecting the right data and analyzing existent data in a way that leads to true value creation goes along with the problems of adoption. Next to the technological hurdles, companies furthermore need to go through a cultural and organizational transformation process when becoming more data-driven (García-Arista, 2016; Baltus, 2016). While Netflix threatens traditional content distribution channels and changes content production processes (Johnson, Fried and Lee, 2017), "the TV industry is still not taking full advantage of the data opportunity to plan its future better" (Tsuchiya,

2014b, para. 2). Generally, there seems to be a sense in the academic literature that the TV broadcasting sector could do more when it comes to big data. Athique (2018) criticizes that data are mainly collected with the "intention of aligning audience tastes with future programming" (p. 63) and only serve as an extension of the aforementioned TV ratings. By adapting to their new competition from the Silicon Valley, media companies need to reflect on how to combine big data with creative processes in a purposeful way, or otherwise, they risk handling the implementation of big data as a "plug-and-play process" (Baltus, 2016, para. 28).

1.4. Academic and societal relevance of the topic

As already described above, big data play an increasingly important role in creative processes and even though much has been said already about the opportunities and challenges that the big data phenomenon entails (e.g. bogy & Crawford, 2012, McAfee & Brynjolfsson, 2012, Walker, 2014, Gandomi & Haider, 2015, Athique, 2018), researchers agree that there is a lack of knowledge about how the ongoing integration of data changes the production and decision making processes of media firms (Napoli, 2014, Morris, 2015), and what intentions firms have to utilize big data for (Johnson, Friend & Lee, 2017). Furthermore, little academic knowledge exists about organizational dynamics, such as tensions within the company, changes in professional norms and practices that surround the adaption of algorithmic tools (Napoli, 2014).

The need for TV broadcasting companies to adapt to technological changes and meet their fierce competition cannot be denied, but the fact that algorithms shape cultural practices and influence media consumption should not be taken lightly. In fact, Hallinan and Striphas (2016) argue that the new practices around data collection and analysis have changed media consumption with "respect to the addressivity of culture". However, these new research practices are seemingly accepted uncritically by the television industry (Kelly, 2017). Many point out that the commercialization of broadcasting communication (Hill, 2014; Bardoel & d'Haenens, 2008) could possibly result in a "commercial loop in which culture conforms to, more than it confronts, its users" (Hallinan & Striphas, 2016, p. 122) because broadcasters are observed to respond to the pressures of the trend of personalized advertising be personalizing their content (Couldry & Turow, 2014). Couldry and Turow (2014) call the current developments within institutions, companies, and between individuals a "momentum of cultural change" (p. 1718) that will eventually transform habits. It can therefore further be argued that big data's possible impact on content is of high societal relevance and therefore creates the need to understand how broadcasting firms intend to implement big data into their daily practices.

1.5. Researching the Dutch TV broadcasting industry

This study's aim is to generate insights about how media professionals are currently using and planning to integrate big data for their creative and managerial decision-making processes. It researches how the opportunities and challenges of big data for content production are met by professionals in the broadcasting industry. The focus is hereby put on the Dutch TV broadcasting market.

Since the research was conducted in collaboration with Media Perspectives, an organization that operates as an innovation-driver within the cross-media industry of the Netherlands, a focus on their operational market seemed advisable. The company is based in Hilversum, where most of the national broadcasting industry is clustered (van der Groep, 2014). The Dutch broadcasting industry conglomerating within one geographical area is only one of several unique characteristics of the Dutch broadcasting market, that make a study on a national level of particular interest. In fact, the public broadcasting sector of the Netherlands used to be a pillarized system, closely regulated by the state, and was gradually transformed and deregulated into a more open, dual broadcasting system in 1989 – a phase that van der Groep (2014) describes as "external shock" (p. 2644) that led to many changes. This increased commercial context was met with internal restructuring processes and optimizations of operations as well as with an adoption of a commercial management style and programming decisions (Bardoel & d'Haenens, 2008). Even though "the public broadcaster has traditionally played a pioneering role, which may have been furthered by the presence of, and the cooperation with Philips, the Dutch manufacturer of electronic consumer goods" (Bardoel & d'Haenens, 2008, p. 355), the innovative lead was taken on by commercial broadcasters. They developed hybrid formats that were located between information and entertainment (Bardoel & d'Haenens, 2008) and started to test out digital possibilities. In this regard, Bardoel and d'Haenens, who researched the Dutch broadcasting industry ten years ago, criticized the lack of a clear online strategy of public broadcasters, even though they are allowed to operate on online platforms by the national as well as the European law.

Since this thesis discusses how Dutch companies that are part of the TV industries can use big data to add value to their corporations and products, a qualitative research approach was used to answer the following question:

RQ: How do companies in the Dutch TV broadcasting industry use data and what are their intentions regarding its possible application for content?

With this research question at hand, the current situations in which professionals work with and are influenced by big data were explored. The research question has also been used to analyze how broadcasting companies plan to use big data for decisions about content in the future. Relevant data was collected through expert interviews with professionals in the TV broadcasting sector. The focus was put on how big data are perceived to change the habits and routines of content production within TV broadcasting organizations and how certain professionals think about the integration of big data for the creation process of content. What might be the right way to collect and use big data for creation processes of creative products? How do their companies currently handle the collection and analysis of data and which obstacles do they face regarding the procurement and implementation of big data analytics for the creation of content? What tensions are they aware of within their companies and their field of work when it comes to the combination of creativity and big data? How do the perceived changes in the industry affect their daily work? Since this work followed an interpretative approach, a latent thematic analysis was carried out by the researcher after the phase of data collection.

The structure of this thesis paper is as follows: First, academic theories that ground the research are reviewed. Multiple streams of literature, including the one on unique characteristics of big data, algorithms and data-driven decision making are presented in order to position this work within relevant research. This offers the chance to articulate gaps in the current body of knowledge and provide support for the argumentation that is applied to this paper. Second, the applied research method is discussed. It also includes a detailed description of the interview partners, the data collection process as well as the analysis. Specific focus is put on questions of validity and reliability. Third, the findings of the data analysis are presented and connected to existing literature. Last, the conclusion offers a critical assessment of the findings, discusses limitations of this study, and points out possibilities for further research.

2. Theory and previous research

Big data are a topic that has been much discussed in academic literature. However, different definitions exist, as will become apparent in this chapter. Therefore, this paper firstly aims at giving a definition of big data and an overview of scholars' different approaches to the phenomenon, and its perceived benefits and challenges. Then, the paper draws from various concepts introduced by in the context of cultural and sociological change and takes a closer look at algorithms, their role as intermediaries for meaning making and production of taste, and their institutionalization. In a next step, an overview of the recent changes in the broadcasting market due to new technological possibilities and data analytics is given. Particular attention is paid to the consequences of enforced competition and strategic and managerial implications. The insights of these two fields of studies are then combined in a third section that deals with big data for content creation. This last section focuses on recent developments, such as the mystification of Netflix, current possibilities of the integration of big data insights into content production processes, and the critics of such.

2.1. Entering the era of algorithmic culture

2.1.1. Definition of big data

As researchers at Batten Briefings (2016) rightfully point out, big data analysis is a domain that is relatively new and became commonly used around 2011 (Gandomi & Haider, 2015). This can be explained by „leading technology companies who invested in building the niche analytics market" (Gandomi & Haider, 2015, p. 138), developing into competitors for traditional firms and creating a hype around the data practices their business models are based upon. However, Batten Briefings (2016) furthermore explain that big data are no longer confined to the IT-industry or tech startups but have an effect on fields such as marketing, product development and business strategy alike. The broad use of big data makes a precise definition even more important. The frame that this paper draws upon is frequently used in academic literature (Johnson, Friend & Lee, 2017; Gandomi & Haider, 2015). It goes back to Laney (2001), who defines three main characteristics that differentiate big data from other data: volume, velocity, and variety. It is important to note that all three dimensions are equally relevant. 'Volume' refers to the magnitude of the generated data, 'velocity' to the speed at which data are generated and analyzed, and 'variety' to the diversity of data (Johnson, Friend & Lee, 2017). In practice, however, especially the aspect of volume is focused upon. In their study, Johnson, Friend and Lee (2017) research new product development processes and big data usage under the application of an exploitation versus exploration framework, showing that the amount of data correlates with a greater "potential to contain new and unique insights" (p. 645) that can be turned into innovations. In other words, a higher volume of data creates additional value for a firm.

Gandomi and Haider (2015) elaborate on additional characteristics of big data besides the 3 V's. They point out that IBM suggested 'veracity' as the fourth V in order to recognize the unreliability of some data sources. Furthermore, SAS added 'variability', the variation in the rates of data flows, as an additional facet that should be addressed through connecting, matching and cleaning data from different sources (Gandomi & Haider, 2015). A sixth V, as introduced by Oracle, is value. This points out to the fact that datasets often carry a low value compared to their volume, making it necessary to analyze large data volumes (Gandomi & Haider, 2015).

2.1.2. The supposed objectivity of big data

Because of "the widespread belief that large data sets offer a higher form of intelligence and knowledge that can generate insights that were previously impossible, with the aura of truth, objectivity, and accuracy" (boyd & Crawford, 2012, p. 663), boyd and Crawford understand the current usage of big data as a mythological phenomenon. Many authors follow their lead and discuss the presumed objectivity of big data. Even though they put it into relation to other models, such as datafication and dataism (van Dijck, 2014) and the Kantian mathematical sublime (McCosker & Wilken, 2014), they support the argument introduced by body and Crawford (2012) that "working with big data is still subjective" (p. 667) and data are not facts (Kennedy, 2015). With the introduction of the mathematical sublime, Kant's argumentation offers an explanation for the presumed objectivity of data: The mathematical sublime describes the phenomenon of being overwhelmed by the size, e.g. of big data, – and the human inability to make sense of such a huge amount of information. Kant argues that people perceive size either in a mathematical – calculating with numbers – or in an aesthetical – calculating with intuition – sense. Measuring size with mathematical means refers to reasoning, while aesthetic calculation is a question of imagination. Kant argues that our power of imagination is limited while the power of reason is not. This, in turn, leads to a feeling of being overwhelmed when trying to comprehend immense size with imagination, and a feeling of respect for what the discipline of mathematical reasoning can offer.

This point of view is for example supported by van Dijck (2014) who elaborates on dataism, an ideology that believes in the tracking and quantification of human behavior through online media technologies, and points at the issue of uncritical trust in the institutions that collect and analyze the data from different platforms. After all, the data gathering takes place in a defined framework and in a given purpose. Instead of acknowledging this, social media platforms are presented "as neutral facilitators" (van Dijck, 2014, p. 199) for data collection, even though these platforms are deciding what is being collected and what is being seen. This tendency also proofs to be found in the work of computational scientists, as

boyd and Crawford (2012) point out. They criticize the habit to "claim their work as a business of facts and not interpretation" (p. 667).

The claim that big data are not handled objectively becomes proven when taking a closer look at the technology behind it. Algorithms help to collect data in the first place, but after all, "big data are worthless in a vacuum" (Gandomi & Haider, 2015, p. 140). This is the reason why big data sets are also amalgamated and linked to each other (boyd & Crawford, 2012) with the help of algorithmic tools in order to 'read' the data and acquire knowledge from them. Since computers require the transformation of reality into numbers that are then handled as a representation of everyday life, building algorithms is a subtractive method that produces "new knowledges and methods for the control of reality" (Berry, 2011, p. 2). But in order to make this transformational process possible, single users have to be grouped together. However, it is often the case that certain individuals and their actions contrast the assumptions that have been made by the data engineers, as it has been the case in the Netflix challenge (see Hallinan & Striphas, 2016). To make the predictive power of algorithms work, such "problem" cases have to be adjusted to fit the norm.

The fact that the algorithms "are not entirely autonomous systems" (Morris, 2015, p. 452) but are instead generated by humans, their judgments, and sense-making (Carah, 2017) is often overlooked by practitioners who see big data analytics as a reflection of reality. According to Morris (2015), algorithms can be understood as the tool that is applied to "raw materials" (p. 452) with the aim of framing meaning. With making patterns visible that human minds cannot detect without the help of algorithms being the goal of data mining (Andrejevic, 2014), data collection goes hand in hand with the phenomenon of the supposed data truism 'The bigger the better' (Kelly, 2017). While everyone agrees that data mining leads to an "explosion of information", many understand it as generating "a near limitless pool of data from which numerous correlation can be drawn and converted into potential economic gains" (Kelly, 2017, p. 13) and forget that with more information does not automatically imply that the sense-making of this information becomes easier in any way. Instead, Andrejevic (2014) rightfully argues that the usefulness and relevance of potentially detected patterns depends on the addressed questions they are supposed to answer, as well as the individual who posed them.

2.1.3. The digital divide

To be able to detect patterns, read them correctly, and arrive at conclusions, computational literacy is needed. Boyd and Crawford (2012), however, detect a growing tendency of separation between the people who build the algorithms from those who merely use the tools and have their data collected, or are not even part of the digital culture yet due to their geographic location or social class. Athique (2018) elaborates on this by pointing out that

"Americans and Europeans are the most surveilled people on Earth, but for those who shop less there is less to scrape" (p. 70). It is therefore important to keep in mind that a lot might be known already about the online behavior of the Western world, but that this knowledge is only a skewed sample of our global society. Andrejevic (2014) also detects "a growing separation of people from their data" (p. 1674) and notes that the data literacy differs between users and the companies that collect the data. This also goes together with the fact that a single user has less ability to make use of his or her individual data, while Internet firms can combine the data of millions of users.

The unequal access to big data is therefore described as 'digital divide' (boyd & Crawford, 2012) that creates new hierarchies. Even though boyd and Crawford use this term to exemplify the gap between the ones that create the algorithms and therefore possess and read them (namely big tech companies) and the ones who feed the algorithms with their digital traces but don't have access to the data pools and wouldn't have the resources to analyze them even if they had (namely users), it can be argued that the same principle applies to tech companies and traditional media companies. From a business perspective, it should be mentioned that not all organizations have data collection systems in place and that the solution market and "the development of web analytics, cloud computing, and social media platforms" (Chen, Chiang & Storey, 2012, p. 1169) is still being led by US firms (Lippel, 2016). A great number of businesses is therefore dependent on a rather small number of firms that owns enormous data sets and the power that comes along with it. These firms have established a dominance in many media sectors "including music, advertising, publishing, and consumer media electronics" (Lippel, 2016, p. 249). Therefore, Lippel (2016) sees a growing economic need for European companies to enforce the development and use of technologies involving big data and Tsuchiya (2014b) warns that companies in the broadcasting sector risk to get left behind in the digital transformation process if they do not embrace the data topic more actively.

2.1.4. How big data constitute culture

Following the description of the ubiquity of data and algorithms, many authors (e.g. Morris, 2015; Walker, 2014; Tsuchiya, 2014a; Berry, 2011) understand them as constituting culture (Kennedy, 2015) and stimulate a critical debate about their societal impact: In the current "techno-euphoric climate of innovation" (Mager, 2012, p. 769), algorithms monitor our tastes and shape what kind of information we discover (Morris, 2015) – they change our experiences around the consumption of cultural goods. Reality is becoming categorized and the way how we engage with information changes (boyd & Crawford, 2012). Ducange, Pecori and Mezzina (2018) argue that big data are becoming "a basic feature of the society" (p. 325) and Mager (2012) goes even a step further in investigating how algorithms carry a capitalist ideology. He uses the example of search algorithms owned by private companies such as

Google to argue that they serve commercial purposes that "are enacted in a socio-political context" and "a neoliberal policy of privatization" (p. 770). Consequently, the term 'algorithmic culture' has been introduced by academics (see Hallinan & Striphas, 2016). It refers to the "use of computational processes to sort, classify, and hierarchize people, places, objects, and ideas, and also the habits of thought, conduct, and expression that arise in relationship to those processes" (Hallinan & Striphas, 2016, p. 119).

Parallels have also been drawn between algorithms and cultural intermediaries. The concept of cultural intermediaries was first developed by Pierre Bourdieu. In the original sense of the concept, the term 'cultural intermediaries' was used to describe a specific occupational group that was situated between production and consumption of cultural goods (Maguire & Matthews, 2010). Often described as gatekeepers (Negus, 2002), these "producers of symbolic goods and services" (Maguire & Matthews, 2010, p. 405) use media to form tastes. As Maguire and Matthews (2010) further explain, the authority and credibility of cultural intermediaries makes it possible for them to persuasively communicate certain products as better than others and sell the created tastes "as widely as possible" (Maguire & Matthews, 2010, p. 407), thereby contributing to the focus of media corporations on statistical numbers that can be translated into profit (Maguire & Matthews, 2010). However, the term has developed into being used as a category for theoretical analysis (Negus, 2002) and was directly applied to algorithms by Morris (2005). He argues that this analogy not only helps to understand how processes of curation and discovery are affected by algorithms but furthermore reveals how these technologies are used as a justification for "legitimacy and quality of the services they underpin" (Morris, 2005, p. 450).

Algorithms are for example employed as cultural intermediaries within recommendation engines. These "meaning-making workers" (Morris, 2015, p. 447) make use of the availability of large data pools and "aggregated individual choices" (Constantiou & Kallinikos, 2015, p. 55) to address users and their needs on a personal level "by recommending potential consumption items, services, habits, experiences or persons" (Constantiou & Kallinikos, 2015, p. 51). Cases such as the Netflix Prize[1] not only made recommender systems ubiquitously applied on the web (Hallinan & Striphas, 2016), they also generated the interest of academia in the topic. Hallinan and Striphas (2016) argue that the growing presence of personalized services eventually changes the meaning of culture and cultural authority. In their eyes, questions of cultural quality and hierarchy – rather difficult in nature – are more and more negotiated and settled by technology and the people who make the decisions about the algorithms. This is a change of traditional practices in the sense that

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[1] In 2006, Netflix opened a competition for an algorithm that would predict user ratings for films based on previous ratings and beat Netflix's own algorithms by 10%. The competition was completed in 2009 and Netflix disbursed $1 mio to the winning team.

these individuals lack connections to and knowledge of the cultural fields that they develop (mathematical) frameworks for.

Apart from moderating the use of cultural products in the digital world and shaping tastes by deciding what users see, recommendation engines also shape how target audiences are presented to producers. Organizations that make use of these practices to learn about preferences and tastes of audiences and deploy social and new media to "monitor, mine and mediate the use of digital cultural products" (Morris, 2015, p. 447) are described by Morris as 'infomediaries'. Thereby, he argues that they differ from cultural intermediaries in the sense that „their ways of framing cultural goods are more organizational and embedded into everyday use than cultural intermediaries" (p. 456).

To conclude the description of the present popularity of algorithmic technologies, it could be suggested to understand the development of algorithms in the media industry as an algorithmic turn. This term was introduced by William Uricchio (2011) who argues that algorithms change how the world is represented and seen. Napoli (2014) points out that "the algorithmic turn in media production is, in some instances, being expanded in ways that go beyond demand prediction and extend into the realm of content creation" (p. 350). Because algorithms gained a more dominant role, he connects them to institutional theory.

2.1.5. Media technologies as institutions

As already outlined above, media technologies' structures "regulate the production, distribution and consumption of content" (Napoli, 2014, p. 343). They control social behavior and lead to sectoral change (Katzenbach, 2011) and are simultaneously formed by social processes. It is this specific "duality that is often identified as a defining characteristic of institutions" (Napoli, 2014, p. 343). Institutions are "symbolic and behavioural systems containing representational, constitutive and normative rules together with regulatory mechanisms that define a common meaning system and give rise to distinctive actors and action routines' (Scott & Meyer, 1994, as cited in Katzenbach, 2011, p. 7). Acknowledging the political dimension of media technologies and applying the analytical concept of governance to them consequently allows us to reveal transforming and emerging structures and processes that exercise control over the behavior of multiple actors (Katzenbach, 2011). It also helps to understand how mathematical practices are used to create legitimacy for regulative processes. What makes the new approach of understanding technology as "a means of regulation" and change-causing "element of media structures" (Katzenbach, 2011, p. 10) interesting is that it has not yet been applied much in academia. Moe (2007) suggests to apply the concept of institutions as a sphere, and therefore to study cultural, democratic and authoritarian functions, frameworks, norms, and practices.

Lowrey (2011) further points out that institutionalism is characterized by the striving for stabilization that translates into an adaption to long-existing conditions and expectations. Therefore, further attention should then be given to the concept of institutional isomorphism: "the tendency for organizations in a particular field to resemble one another across a variety of dimensions" (Napoli, 2014, p. 351). It derives out of organizational and societal expectations and uncertain environments that are troubled by disruption and instability.

Within the media industry, these uncertainties traditionally concern audiences and technologies and culminate in the reinforcement of industry trends (Lowrey, 2011). This is due to the fact that in such environments, companies tend to align their activities and strategies to the ones observed to be carried out by their competitors in order to meet their success. Another reason for isomorphic tendencies is an increase in professionals with a similar educational background within one operational field (Napoli, 2014). The phenomenon of mirroring existing practices to demonstrate caution and legitimacy is especially found within organizations that are protected from direct market influences while organizations that are more directly exposed to market dynamics are known to adapt more substantially (Lowrey, 2011). Researchers warn that data-driven institutional isomorphism could lead to a lack of diverse content (Napoli, 2014) and could "turn the world to grey" (Walker, 2004, p. 182-183). Lowrey (2011) uses newspaper companies as an example for media institutions that require public legitimacy and had found wide acceptance of norms and practices across the industry. He argues, however, that these facts contribute to attempts of adjustment to the digitization being rather superficial and lacking the support of staff (Lowrey, 2011). The traditional players within the broadcasting industry have also proven to be rather reactive than innovative when it comes to big technological changes. The industry seems to be lagging behind in digital transformation processes and orientate itself towards the big tech players dominating the market.

2.2. Big data in the media industry

2.2.1. The discourse around big data's competitive advantage

Overall, big data insights are seen as the chance for the media industry to perform the digital transition and become more data-driven (Tsuchiya, 2014a). But the "fairly rapid institutionalization of algorithmically driven decision-making in the media sector" (Napoli, 2014, p. 354), as it has been outlined above, also changes long-established business parameters (Constantiou & Kallinikos, 2015) and is therefore discussed critically. This might be partly due to the fact that "guesswork, inspiration or hunches" – "the currency of creative practitioners" (Walker, 2014, p. 183) is opposed by the supposed objective nature of big data. The discussion around the optimal combination of expertise and analytics is not new. A study by Burke and Miller from 1999 already points out that the majority of decisions are

made on the basis of intuition and data analysis combined. Furthermore, a study carried out by LaValle, Lesser, Shockley, Hopkins, and Kruschwitz (2011) proves the connection between a firms' performances and their use of analytics. Johnson, Friend, and Lee (2017) nonetheless note that the rise of big data has transformed the "information environment firms operate in as well as the capabilities to successfully perform in the market" (p. 642). Nowadays, it is commonly believed that big data let media professionals make more informed decisions. This tendency is not only observable within the industry, but also in the academic literature that approaches the topic of big data from a business standpoint. Knowledge is believed to be best acquired through big data and the adoption of information technologies as well as the practice of data mining is seen as valuable for competitive advantage (Constantiou & Kallinikos, 2015; Andrejevic, 2014). McAffee & Brynjolfsson (2012) praise big data analytics a way "to measure and therefore manage more precisely than ever before" (p. 4), which, according to them, leads to better decisions and could revolutionize management.

But even though many express the view that data-driven decision-making is based on evidence instead of intuition (eg. Gandomi & Haider, 2015, McAffee & Brynjolfsson, 2012), it is also clearly stated that working with big data also poses new challenges and does not automatically lead to a better performance (Ducange, Pecori & Mezzina, 2018). Even though firms might feel the need to competitively differentiate themselves through innovating, most organizations do not use the huge amounts of data they are collecting effectively yet (LaValle, Lesser, Shockley, Hopkins & Kruschwitz, 2011). Since big data can be used to make predictions, and therefore plays a growing role in decision-making (Andrejevic, 2014), the need to discuss the role of expertise in the context of big data has been expressed, too. On the one hand, "(t)he circumstances of big data production are, in most cases, not controlled by organizations" (Constantiou & Kallinikos, 2015), consequently leading to the principles of expert knowledge often not applying to big data. Their dynamic nature makes decisions based on experience or past solutions in many cases not the most effective ones (Constantiou & Kallinikos, 2015). On the other hand, it is also argued that organizations still need vision and creativity (Batten Briefings, 2016). To achieve that, the right people need to be brought together with the right data (McAffee & Brynjolfsson, 2012). Therefore, firms need to understand the principles that underlay algorithms (Carah, 2017) and "should have a clear understanding of the 'why'" (Batten Briefings, 2016, p. 3).

2.2.2. Strategic implications of big data

While authors from the field of cultural studies and sociology express the need of today's businesses to be aware of the potential pitfalls of big data and ask critical questions before jumping to conclusions, business literature mainly discusses the opportunities of the

phenomenon and outlines the required changes that companies have to undertake to become more data-driven. However, it is also noted that big data challenge businesses in their core management practices (Constantiou & Kallinikos, 2015).

Because big data are collected by social and organizational structures so entirely different than the ones traditionally in place, their characteristics – being unstructured, heterogeneous and agnostic – stand in stark contrast to the structured data that firms commonly used to apply to their existing models and tools (Constantiou & Kallinikos, 2015). This implies that the methods that were employed to support the firms' objectives "will need significant modification, if not replacement" (Constantiou & Kallinikos, 2015, p. 45). However, companies do not adapt to this new kind of information equally successful. Not every leader of a firm understands yet that big data insights are most valuable if applied to the whole scale of the business. Since big data insights usually have a short actuality and reflect real-time events, some only use them for decision-making of every-day-practices. Many business leaders hereby focus on the short-term benefits that can be achieved by exploiting the existing infrastructure without committing to spending efforts and resources on new technologies – a strategy that would, according to Wessel, actually be the right decision on the long-term (2016).

Academic literature, though, outlines the possibilities of big data analytics to renegotiate the impact of the "standard premises of strategy making" (Constantiou & Kallinikos, 2015, p. 50) that are based on long-term commitments. Therefore it can be argued that if companies want to succeed in applying big data to their organization, they need to embed it in their overall business strategy. Constantiou and Kallinikos (2015) define the basis of strategy as "information derived from data collected through systematic and purposeful processes that address specific information needs of the decision makers" (p. 45). LaValle, Lesser, Shockley, Hopkins, and Kruschwitz (2011) indeed demonstrate that successful firms let a wide range of decisions be affected by analytics. Not only do analytics play an important role in their day-to-day operations, they also guide their future strategies. But Andrejevic (2014) also points towards the fact that data cannot "set the agenda" (p. 1679) themselves. Therefore, big data analytics should not be used in the vacuum of a lacking business direction if managers want to circumvent wasting resources and sparking skepticism about the perceived value of analytics (LaValle, Lesser, Shockley, Hopkins & Kruschwitz, 2011). The management of firms has to accept that the top-down, standard approach of strategy making is outdated (Constantiou & Kallinikos, 2015) and instead use the potential of big data to develop a more "ad hoc, inductivist way of strategy making" (Constantiou & Kallinikos, 2015, p. 51). Eventually, it is not the use of big data that will decide about competitive advantage, but their implementation into strategy.

Experts agree that pace matters in this regard (e.g. Johnson, Friend & Lee, 2017, Batten Briefings, 2016). Firms need to be able to react quicker to data-driven insights than their rivals in order to spur on innovation. Because being fast and agile is a challenge for many companies, their adaption to the big data transformation implies changes in their business culture. Carah (2017) expresses the need for companies to "create a routine flow of data" (p. 386). Even if that is established, the challenge remains to make data-driven insights actionable across the organization. In order to achieve that, they need to be made "easy for end-users to understand and embedded into organizational processes" (LaValle, Lesser, Shockley, Hopkins and Kruschwitz, 2011, p. 22).

By now, it should have become clear that far from being an isolated activity, a strategy that bases on data-based decision making affects the very core of organizations, as well as the relationship with a variety of their stakeholders (Constantiou & Kallinikos, 2015). The cultural change that goes along with the rise of big data as a new business paradigm is believed to be a bigger challenge than the technological implications that are needed (Batten Briefings, 2016). Firms need to develop a new mindset and a new set of skills – but how can these qualities be fostered by management?

2.2.3. Successfully managing the big data transformation

First of all, management has to identify the key challenges. Experts point out that even though the collection of data or the establishment of technology challenge existing firms, the biggest barrier is of managerial and cultural nature (LaValle, Lesser, Shockley, Hopkins and Kruschwitz, 2011). Constantiou and Kallinikos (2015) point out that the social environment of a firm has its own practices for handling internal and external changes. Furthermore, they describe established routines as an institutional mechanism "that store experiences and govern attention" (Constantiou & Kallinikos, 2015, p. 47) and therefore affects the input that is provided for the development of a strategy. These routines also explain why managers are observed to collect the data that is easiest to measure for them (Lee, 2018).

If managers dedicate themselves to data-driven decision making, they take value out of big data's possibilities to analyze trends, forecast events, and standardize reportings (LaValle, Lesser, Shockley, Hopkins and Kruschwitz, 2011). Furthermore, they use "statistical analysis and data mining techniques…for association analysis, data segmentation and clustering, classification and regression analysis, anomaly detection, and predictive modeling" (Chen, Chiang & Storey, 2012, p. 1166). To successfully apply all these models, the establishment of a centralized data department has proven to enable the sharing of analytical tools and professionals (LaValle, Lesser, Shockley, Hopkins and Kruschwitz, 2011). However, many data professionals such as engineers and analysts commonly report the difficulty to explain their work to non-experts and discuss important aspects of their work outside their community (Hallinan & Striphas, 2016). To include staff with limited

technological knowledge in the process of change, it is therefore required to humanize big data tools (Lippel, 2016). This is usually done by offering intuitive reporting tools consisting of graphics that assist in analyzing the data (Chen, Chiang & Storey, 2012), make insights understandable and help to make data acted upon in every part of the organization – no matter the skill level (LaValle, Lesser, Shockley, Hopkins and Kruschwitz, 2011). The phenomenon of showing what cannot be explained has also been described as the "contemporary version of the Kantian mathematical sublime" (McCosker & Wilken, 2014, p. 158). Because data visualizations serve as a form of translating the complexity of big data analysis outcomes into easy-to-understand outputs, many firms perceive them as increasingly valuable. Within the Internet and media industry, the fascination with data visualization (McCosker & Wilken, 2014) has led to the common practice of visualizing key metrics in dashboards as an additional business reporting function (Chen, Chiang & Storey, 2012).

2.3. Raising importance of data analytics in the broadcasting sphere

As outlined in the introduction to this paper, the changing media consumption habits that resulted from the rise of new technologies and online communication channels have caused the broadcasting industry to change long-established practices. They especially led to a diversification of products. While content is still distributed through traditional channels, audiences can also find the information and entertainment they seek online. This development took place on the basis of the need for reduction of costs and generation of revenue (Lippel, 2016). With audience attention being a scarce source nowadays, digital platforms are believed to have the ability to regain the control over audience attention through data (Smith & Telang, 2018). This leads to the broadcasting industry's evolvement into "a logic of file databases" (Evens, 2010). The expansion into new business areas creates the need to understand modern broadcasting companies first and foremost as media companies that substituted their core practices – radio and television broadcasting – with media products such as websites, podcasts, or video on-demand platforms.

The digitalization of the media industry has not only added new channels through which broadcasters can distribute their television content (Doyle, 2016), but has also had "major implications for the sort of programming material that is now in demand" (p. 635). The development of online platforms led to new programs – especially because so-called Internet-originals are used as a differentiation method in today's highly competitive media environment (Waterman, Sherman & Ji, 2013). So far, data are mostly used to create a match between viewing tastes and content (Smith & Telang, 2018). This new model is facilitated by the elimination of gatekeepers such as cable companies that used to take the role of intermediaries between producers and consumers in a traditional setup (Evens,

2010). The direct connection that broadcasters could now establish with their audiences is further enhanced by data mining methods that allow them to offer targeted content. All in all, the online presence of the majority of broadcasters is believed to improve the customer experience and said to create a new kind of relationship with the customer (Smith & Telang, 2018). Further benefits that arise for broadcasters from this development are an intensification of trust and loyalty of their audiences and strengthening of their brand (Bardoel & d'Haenens, 2008).

2.3.1. Social media analytics for media companies

Since big data get integrated in "the market research culture of the television industry" (Kelly, 2017, p. 10), broadcasters identified social media analytics as one possible method to gain knowledge about audiences online. Many media organizations try to bridge the big data divide by analyzing the publicly available social media data of their audiences. Social media analytics, "the practice of gathering data from social media platforms and analyzing the data to help decision makers address specific problems" (Lee, 2018 p. 199), include practices such as text mining, sentiment analysis and the collection of user location and profile data. This form of big data analysis is often presented as replacing the single-lane communication of media firms with a dialogue between them and the users they serve (Chen, Chiang & Storey, 2012). Because the utilization of social media analytics is cheaper and faster than traditional analysis and facilitated as well as customized by a variety of open-source tools and commercial providers (Lee, 2018), social media analytics nowadays offer the possibility to every media firm to take the online behavior or their audiences into account for their decision making. This way, social media analytics are argued to bridge the existing data divide instead of increasing it and help broadcasting companies to achieve more independence from viewing rating providers (Kelly, 2017). Incorporating consumer behavior insights into media products – for example news – is often believed to lead to a richer relationship with the users of these products (Lippel, 2016). This goes together with the perception of many that ignoring big data analytics leaves companies with a "wasteful and random approach" to serve their audiences the best possible way (Lippel, 2016, p. 247).

However, many authors warn of the possible challenges that companies face when using social media data and try to raise awareness of the following aspects: First of all, they point out that social media data can be biased (Lee, 2018). Lee (2018) argues that the data collected through social media does not offer a representative picture of society and recommend to not extrapolate it to the society as a whole. Firms, therefore, need to keep demographic characteristics of the social media user groups in mind and need to be aware that "certain methods and forms of knowledge are privileged by the design, affordances and

limitations of these emerging technologies" (Kelly, 2017, p. 10) when applying social media insights to their decision making.

Secondly, Lee (2018) argues that social media data can be noisy. This goes together with the fact that algorithms cannot make sense of user behavior phenomena such as hate-linking, subtweeting or quoting via screen captures (Tufekci, 2014). All these practices exemplify the "blindness" and therefore the limitation of algorithms to make sense of sentiments and online behavior of audiences and demonstrate how the interpretation of reality can become displaced using social media analytics. Additionally, practitioners should be aware that social media and other media channels, such as broadcasting, interact with and are closely connected to each other. Tufekci (2014) points towards viral videos and the fact that they often only rise in popularity after being discovered by broadcasters. Another potential pitfall in applying social media analytics is the wrong selection of metrics (Lee, 2018). Therefore, managers should make sure to achieve social media intelligence – the combination of existing knowledge, knowledge gathered with other, potentially also traditional means, and social media analytics (Lee, 2018).

2.3.2. Perceived usefulness of big data for content

As outlined in section 2.2.1., the right application of big data is connected to competitive advantage. Broadcasting companies try to become more data-driven by diversifying their products into the online sphere to be able to track and analyze their users' behaviors and by using external data, for example from social media. With the application of big data analytics in the broadcasting industry, potential benefits of these practices are not being discussed for an optimization of the distribution of content and high relevance of advertisements, but also content creation. This is not only a reaction to shifting viewing behavior and technological possibilities but also because of an intensification of the competitive field. Concerning the last aspect, the company that is clearly leading the academic and public discourse in this regard is Netflix.

Netflix did not start creating attention recently. Instead, the company's approach to entertainment has been discussed controversially in as early as 2006, when it launched the Netflix Prize to improve their recommendation system. While it took the contestants around three years to succeed in raising the predictive power of the algorithm by ten percent, Netflix changed its content recommendation strategy while the competition was still ongoing. Instead of taking movie ratings into account, the company decided to use other, more implicit signals, such as "when users start, stop, rewind, fast forward, and pause videos, in addition to logging the time of day of viewing, the user's location, the device on which the streaming occurred, whether the user watched a program from beginning to end, what if anything she or he watched next, and more" (Hallinan & Striphas, 2016, p. 128). As such, Netflix's

approach to entertainment indeed has transformational power since it leads to a redefinition of how success is defined in the industry (Smith & Telang, 2018). Instead of measuring viewing numbers and advertising revenue, Netflix cares about subscription numbers – and therefore the viewer's overall satisfaction with their platform (Smith & Telang, 2018). Since Netflix follows the example of other tech companies and really delivers insights into how its algorithms are applied to make decisions, nor engages a discussion about this topic, the "semantic and socio-technical processes by which these connections are made" (Hallinan & Striphas, 2016, p. 117) become mystified. By now, however, there exist two narratives about how Netflix became so successful. Because of the supposed industry's tendency for institutional isomorphism (see section 2.1.5.), a closer look is taken at both of them.

The first narrative discusses Netflix's supposed ability to use big data insights to create better content. Netflix is known for its distinctive capability to collect massive amounts of data and apply the derived insights to its business. The roughly fifty data points that they track are believed to enable them to predict consumer demand better than any other company in the field of broadcasting entertainment could ever before (Havens, 2014). As has been mentioned in the introduction to this paper, House of Cards is commonly treated as "the most advanced application to date of Big Data to programming decisions" (Havens, 2014, p. 5). However, academics such as Havens (2014) actually doubt Netflix's data intelligence on consumer preferences about content or production techniques. Havens rejects the hype around Netflix's "factor based approach to pursuing House of Cards" (Hallinan & Striphas, 2016, p. 128) and argues instead that House of Cards is not even to some degree as innovative as it is claimed to be. Instead, he even calls it "aesthetically uninventive" (p. 6) and points out the misconception that the decisions about the cast and the director of the series were made by the algorithm itself. He bases his argument on the fact that Netflix only communicated three content variables that were used to come up with the idea of House of Cards, namely the director, the main character and the genre of the series. Therefore, he argues that the degree of big data being used for creative decisions about content creation has not significantly changed compared to earlier years and that the series is instead still based on decisions made by programmers with the help of a few data points. He concludes that "television programming decisions in the digital age might not be all that different than those in the analog age" (Havens, 2014, p. 7).

The second narrative deals with Netflix's strategy of tagging content and creating micro-genres (Russell, 2014). With the attempt to understand the searching behavior of their audiences, the company created roughly 80,000 micro-genres with the help of specially trained people who watched and manually tagged every movie (Madrigal, 2014). It is now argued that the combination of these tags with Netflix's data about viewing habits create their

true competitive advantage. Big data are hereby not applied to decisions about content, but to a content distribution strategy that targets the viewer on a personal level. Thereby, Netflix not only changes how movies but also how audiences are classified. The video service clearly abandoned an undifferentiated mass addressment and instead created micro-audiences that can be paired up with the fitting content (Hallinan & Striphas, 2016). This approach, in turn, is said to potentially lead to more creative freedom instead of less, because it allows Netflix to not only focus "on offerings with surefire mass appeal" but create unique content. (Smith & Telang, 2018, p. 3). The approach that Netflix deploys with their user data has been described as "matchmaking" that "will only get better as technology advances" (Smith & Telang, 2018, p. 4).

Despite Netflix's massive amounts of data, the fact that the popular video service declines information about their field of application lets it remain difficult to estimate the role of big data for creative processes within the company (Kelly, 2017). It is important to notice, however, that the broadcasting industry holds different products and does not only consist of video-on-demand platforms. Even if big data do not affect the decision making about movies, series, or shows to an extensive degree yet, their role for content within the industry is nonetheless changing. Broadcasters are anticipated to vary their content based on the insights they gained from their audiences through big data analytics (Couldry & Turow, 2014) since the success of their content and the success of their company as a brand depends on the interest the content generates (Malmelin & Villi, 2017). The digitization makes the building of audience demand and skimming of highest possible returns through content challenging (Doyle, 2016). The high production costs that characterize the industry furthermore create the need to "know and anticipate audience tastes" in order to predict the return on investment (Havens, 2014, p. 6) and make big data therefore so attractive for them.

Despite the perceived need to create highly relevant content for their audiences, there exists not much literature yet on the usability of big data for content creation or emerging practices as observed in the field. In the Netherlands, the missing innovative power of the public broadcasters has been explained by the strict categorization of formats in either information or entertainment and their perception of their audiences as citizens instead of consumers, letting commercial firms lead the innovative progress (Bardoel & d'Haenens, 2008). Even though the new measurement methods allow media companies to gain more precise insights about viewership and to calculate the value of a single viewer or show to advertisers, Couldry and Turow noticed in 2014 that publishers, at least, had not made any efforts yet to change the strategic direction of the content they create. The same year, Hills (2014) researched how Twitter data can help to predict TV viewing preferences and confirmed the predictable power of social media platforms. In this case, the researchers used

songs to demonstrate that "online buzz is an excellent predictor for sales" (Hills, 2014, p. 83). Shortly after, it became noticeable that the demand for high-end dramas is rising due to the rise of subscriber services (Doyle, 2016). Furthermore, traditional viewing habits got disrupted by the phenomenon of binge-watching that was introduced by Netflix after analyzing that their "customers tended to watch several TV episodes back to back instead of one at a time" (Hallinan & Striphas, 2016, p. 129). This also led to a change of structure and content of on-demand series and created the possibility to forego cliff-hangers and other narrative elements that were intended to keep the attention span on traditional distribution channels high (Hallinan & Striphas, 2016).

2.3.3. Possible future scenarios and warnings

Since big data are enabling real-time analysis, it is anticipated that this will lead to more content being produced that facilitates this type of data, namely live or event formats (Kelly, 2017). It is furthermore believed that the demand for high social media activity leads to those formats being designed differently (Kelly, 2017). Creatives thus expressed worry that the obtained knowledge about the audiences weakens their creative freedom and pressures them to beholden „to the demands of the algorithm" (Havens, 2014, p. 5). Therefore, they stress that work of interpretation of cultural trends and tastes still holds relevant for the industry (Havens, 2014). Interestingly enough, they are not the only ones indicating criticism or reluctance in this regard.

The characteristics of big data analytics – to surface patterns that correlate on an inductive level – are observed especially critically. Andrejevic (2014) explains that big data mining "provides predictive power and actionable information but little in the way of explanation" (p. 1679), thereby letting reasons behind observed behavior become irrelevant. This development is perceived as a "new media logic" (Couldry & Turow, 2014, p. 1711) and is said to influence our democratic structures. Without intending it, the coexistence that developed between content production, big data analytics and the dependency on advertising revenue of some players renounces audiences a collective experience (Couldry & Turow, 2016). In this context, much attention is payed to the dynamics of personalization. When what content is to be discovered by an individual person is decided by algorithms and based on assumptions derived out of data-driven insights whose criteria remains unknown to the user, the new media logic affects established democratic principles. After all, "(d)emocracy depends on some effective form of participation, which media have played a major role in sustaining" (Couldry & Turow, 2014, p. 1711) for decades. Now that time spent on a product decides inter alia about the (monetary) success of media companies, the role of media in our democratic society is notably changing. It should furthermore not be forgotten that the use of online services or services that are connected to the Internet and therefore make big data collection possible, is not spread equally across demographics. This can

potentially lead to certain demographics becoming invisible to marketers and content producers and others being privileged (Kelly, 2017).

Couldry and Turow (2014) are advocating a transparent and public discussion of the yet hidden processes of algorithmic culture. Viewers, however, more often than not lack awareness of the role that algorithms nowadays play for television culture and lack understanding of processes such as television ratings and their defining power of content consumption (Kelly, 2017). Therefore, the idea that "people will take personalization for granted as the lens through which to understand the world" (Kelly, 2017, p. 1718) serves especially as a cause for concern. Seeing more favorable content will not lead to more informed citizens. Instead, the segmentation of media audiences runs into the danger of enhancing the segmentation of society as a whole.

2.3.4. The role of regulators

Within the current developments of the broadcasting industry and media industry as a whole, responsibilities are not only assigned to the corporate world. Instead, "(t)he lines of responsibility and power between corporations and governments are getting increasingly blurred" (Riccio, 2018, para. 11) and many advocate for governments to take on a stronger role. Governments are criticized for their weak influence of the transformational processes and believed to react to demands from the industry instead of putting rules in place that would allow to steer or control the developments (Galperin, 2004). Hereby lack of expertise is named as one of the reasons for a slow reaction towards changing environments (Mager, 2013). Another is the growing tendency of privatization that consequently leads to a shift in control (Mager, 2013). While acting risk-averse by nature, European governments are argued to have created a power vacuum that globally acting tech companies are observed to take advantage of (Riccio, 2018). With the rise of these new market entrants, governments now struggle to establish national rules and regulations for these global players (Galperin, 2004). In this atmosphere of disruptive change, businesses seem to lack confidence as well as the ability to translate the hype around big data into actions that they can truly benefit from. Instead, they pass the responsibility on to the legislative bodies who are asked to create shared standards and an ecosystem that is based on stronger collaborations ((Lippel, 2016)). Lippel (2016), thus, misses European companies to take on their multinational competitors in a proactive way and suggests the industry to focus on "its strengths of creativity and free movement of people and services, in order to bring together communities of industrial players, researchers, and government" (p. 258).

This chapter has given a comprehensive overview of the big data phenomenon. It described how big data are mythologized and treated as objective facts, how algorithms shape tastes

and change cultural practices and how this challenges media companies in general and TV broadcasting companies in particular. Hereby, the cultural dimension of big data and the mediating role of algorithms as intermediaries was critically analyzed by means of recommendation systems. The chapter offered the perspective of theorizing media technologies as institutions and examines how they affect the media landscape and media businesses' decision-making strategies. Then, a deeper exploration into the possible implications of big data for content creation followed that combined existing knowledge around data-based decision-making with internal data – like Netflix – and external data – for example social media analytics – with its implication for creative products. Thereby, room was given for criticism as well as the role of regulators. This chapter follows an overview of how further exploration into this yet under-researched topic is achieved with a qualitative approach.

3. Research design

To add to the existing literature, this research aimed at finding out how TV broadcasting companies in the Netherlands use big data and what their intentions are regarding its application for content processes. As outlined above, data-driven media content is a rather novel topic that research lacks knowledge of. Thus, the knowledge-creating process especially implied insights into professionals' notion about big data and their understanding of big data's possible impact on their professional field. In-depth expert interviews were identified as the right data-gathering method to derive rich and detailed insights about the interviewees' perspectives and meanings.

Because interviews, as a method for data collection, offer the best possibility to develop an "intimate understanding of people and their social worlds" (Hermanovicz, 2012, p. 480), they are widely used to gain insights into personal perspectives. These perspectives are usually obtained interactively through the dialogue with the researcher. The interviewee is hereby required to "share rich descriptions of phenomena" (DiCicco-Bloom & Crabtree, 2006, p. 314), but the interpretation of these descriptions are left to the researcher. One of the main characteristics of in-depth interviews are their high level of flexibility and their lack of structure (Edwards & Holland, 2013). On the one hand, the researcher has a clear list of topics and themes that should be covered, but on the other hand, the method allows to make changes as required by the situation or context of the interview. Edwards and Holland (2013) even argue that situation-specific knowledge can be produced if these relevant contexts are brought into focus by the researcher during the interview. Consequently, the researcher takes an active role in the meaning-making process (DiCicco-Bloom & Crabtree, 2006). In the case of this study, this specifically implied that the big data phenomenon was put into context for the different interviewees, as the next section will elaborate on.

3.1. Sample

Since the sample had to provide the data that was needed to answer the research question (Edwards & Holland, 2013), a purposive sampling method fitted the needs of the research best. However, the sample was at the end obtained through a mix of purposive sampling and snowball sampling, as will be explained below.

Before the search for interview partners started, the set of potential interviewees was defined. Hereby, the researcher followed the approach of Evens (2010), who sees broadcasters as content publishers and distributors alike who either produce the content in-house or buy it from production firms. Therefore, the study first aimed at professionals working for broadcasters and production firms. In order to address the tension between algorithms and decisions about content creation that became evident in the theory section, data engineers, analysts, content creators, and strategical and managerial decision-makers

were identified as fitting professional roles for the study. Because it was presumed that the different points of views of the various professions as well as the statuses of the different companies within the Dutch TV broadcasting system would best become evident with a sample diverse enough to reflect the Dutch broadcasting landscape as a whole, the sample was designed to cover the whole range from public as well as commercial broadcasting companies to different production firms. Since the literature review showed that not all companies in the TV industry collect and analyze big data to the same extent, it was furthermore specified that employees from companies that differ in this aspect would be selected.

Because of the unique public broadcasting system of the Netherlands, the researcher desired to interview professionals from different levels within the system. In other words, the importance was recognized to interview not only employees of the public broadcasting on a national, but also on a regional, and if possible even on a local level. To ensure the desired depth of knowledge, it was determined that potential participants had to (1) be working in the Dutch TV broadcasting industry, (2) have an appropriate amount of working experience (Etikan, Musa & Alkassim, 2016) or expert knowledge that differentiates them from other employees in the same company, (3) have an informed opinion about big data that exceeds their daily practices, and (4, if applicable) be knowledgeable about their business unit's/company's use of data. Only professionals that at least the first three points of criteria applied to qualified for the participation in the study.

It was assumed beforehand that this criteria would lead to most interviewees being elites. Elites are defined as "persons who are leaders or experts in a community" (Kvale, 2007, p. 5). Since researchers are known to experience challenges in access to elites (Littig, 2008), the research benefitted from Media Perspectives' network within the industry that helped to realize the purposive sampling. Concerning the method of sampling, the researcher was aware of the subjective nature of this technique and its limitations as discussed by Etikan, Musa, and Alkassim (2016) but as will be discussed below, it was believed and proved true to be the right method for the research purpose.

After the interviewing criteria had been discussed with Frank Visser, the person responsible for the project at Media Perspectives, access to seven potential interviewees from within Media Perspectives' network that met the requirements was established. All seven potential interviewees agreed to be interviewed about the topic. If a specific department or individual was named in connection with big data and content creation during the course of the interviews, the researcher then asked the interview partner to establish contact to someone within the department who could be considered knowledgeable or had a high possibility to add an interesting perspective. With this snowballing method, contact with more than 15 potential interviewees could be established, of whom seven agreed to be

interviewed. Two additional interview partners were found during events about the topic that took place in Utrecht and Hilversum during the time of data collection.

During the sampling and data collection process, it became apparent that the topic is not yet widely approached by professionals in the field. Instead, it seems like the uncertainty and novelty that surrounds data-driven decision making leads many media professionals to believe that they cannot contribute to ongoing research about the topic. Many of those requested to participate declined, stating that they would not know enough about the topic or saying that their company did not work with big data extensively, or had just started using it. Furthermore, due to the interview partners being elites, many stated a lack of time as the reason to decline the interview. Especially professionals in the higher management, such as the Head of Television or Managing Director Content, declined due to a lack of time. However, some also indicated (indirectly) that they could not yet share details about data strategies or new data-driven content cases due to confidentiality. It twice was the case that an interview was declined due to "wrong timing" and a press release reviled shortly after a new collaboration or change of strategy. During the data collection process, it for example was made public that Talpa, a Dutch media network whose owner has bought the commercial broadcaster SBS in summer 2017, is restructuring their online video platform Kijk and plans on sharing their Dutch content with RTL and their competing online product Videoland. Furthermore, RTL announced a consumer-centric strategy and the merge of their two video-on-demand platforms RTL XL and Videoland. Not only do these events highlight the high speed at which the Dutch market is currently changing, they also explain why interview requests at Talpa were answered relatively distantly and why all decision-makers responsible for content at RTL refused to participate in this study.

In the end, 16 interviews were conducted, whereby most of the interview partners hold a background in technology. Six interviewees work for a public broadcaster, three for a private one, and three for production firms. Two interviewees are former employees of a broadcaster in Hilversum (one public, one private) and still have strong ties to the industry. One of them founded his own software company that aims at enabling data-driven content and the other one develops educational programs at a Dutch university to counteract the lack of talent within the industry. Furthermore, both still work as strategic advisors and were therefore identified as experts that fit the purpose of the study. As new themes emerged from the interviews, contact was also established to a Dutch on-demand-platform that is a cooperation between the public and private broadcasters and to the Dutch government, namely a policymaker at the Directorate for Media and Creative Industries. An overview of the interviewees is included in Appendix B.

3.2. Operationalization

To answer the research question, a catalog of questions was developed that served as the foundation of the interviews. The lists of topics covered and questions asked in the interviews can be found in Appendix A. The topic list A.1. offered the researcher the flexibility to decide when and how to ask the questions and to adjust the course of the interview to the participant's answers (Edwards & Holland, 2013). Since dividing the conversation into topical stages is recommended by Hermanovicz (2012), a structure that starts with questions to warm up and lead to questions that are more topic-specific, was constructed. To keep the exploratory approach, the main questions were held relatively broad and were then followed by more specific sub-questions that depended on the interviewees' answers. Many probes, such as silence, rephrasing and asking for clarification (Hermanovicz, 2012) were used. Furthermore, it should be noted that the question catalog was slightly adjusted during the data collection due to the iterative process of the study. This way, unexpected themes that develop during the interview were taken into account (Edwards & Holland, 2013). In any case, the questions varied per interview depending on the specific working field of the interview partner. For transparency, Appendix A.2. offers an example of the questions asked to an interviewee whose expert opinion cannot be covered by the regular topic list. The participants' answers, audiotaped and transcribed, counted as data and served as the basis from which to draw conclusions about the researched topic.

The topics and questions in the interview guide are connected to the theoretical framework and deal with big data's responsibility for changes within the TV industry, their perceived importance, adaptions to the big data phenomenon on an individual as well as an organizational level, and opinions about an ideal implication of algorithmic technologies in the production process. According to Napoli (2014), **"the role of routines, norms, rules, or behavioral guidelines often can serve as an important point of entry or context for understanding the behavior of organizations"** (p. 342). Therefore, questions about the habits of data collection and interpretation were crucial to being asked. Addressing the competitive advantage through data-driven decision-making, Brynjolfsson, Hitt, and Kim (2011) furthermore suggest questions about how big data are used for the development of new products and services and how big data are used for the decision-making on a managerial level. Hereby, possible probes were included in the topic guide that would help to learn about specific examples.

Theories such as datafication and dataism (van Dijck, 2014), the Kantian mathematical sublime (McCosker & Wilken, 2014) and data truism (Kelly, 2017) as well as algorithmic culture (Hallinan & Strippas, 2016) were operationalized in Topic 1: *How big data create market changes and changes in daily practices*. Within this topic, the researcher explored the perceived change of the broadcasting market due to big data and the opinions about

opportunities as well as potential negative effects of big data in this regard. This topic also included questions about daily practices with big data and asked for an assessment of most important developments and further focuses.

The second topic, *Big data and their effect on decision-making and content production*, explored the current state of data-driven decision making and content production (see section 2.2 and 2.3.2.) by asking questions about the collection of internal and external data, the operationalization of big data insights for different fields of application, and the perceived importance of big data insights for content creation as well as its current stage. It furthermore operationalized the theory of strategic change (Constantiou & Kallinikos, 2015), the managing aspect of big data, including data visualizations and the humanization of algorithms through dashboards, and the role of social media analytics, as outlined in section 2.3.1. Additionally, questions were included about obstacles, the change of decision-making authority and the changing role of experts. It is believed that concepts such as algorithms as cultural intermediaries (Morris, 2005), institutionalization of media technologies (section 2.1.5.), as well as institutional isomorphism (Napoli, 2014) could be explored by these questions and became apparent during the latent thematic analysis.

The digital divide (boyd & Crawford, 2012) and future scenarios as outlined in section 2.3.3. of this paper were operationalized and explored in Topic 3, *Big data's possibilities and ways forward* by questions such as "What kind of differences are you aware of that exist between traditional linear TV and online products (e.g. streaming services or websites) in regard to the integration of big data analytics?" and a question about strategies that ensure competitiveness.

Concepts such as institutional isomorphism were furthermore addressed indirectly by asking questions regarding adaption processes and perceived competition and market changes. It was also expected that the topic of social media analytics or the role of legislation would automatically be talked about in the cases where those phenomena are of importance and therefore, no questions explicitly aiming at gathering knowledge about those topics were included. It was also assumed that questions such as if big data are mythologized and institutionalized by the respondents could only be answered after analyzing closely what had been said and *how* it had been said. Therefore, the theoretical framework played an important role during the phase of data analysis since many of the concepts that were elaborated on in the theory section were only to be revealed on a latent level.

3.3. Data collection

Between March and May 2018, a total of 16 interviews was conducted with experts within the Dutch TV industry. During the first direct contact with the researcher (usually via email),

the research purpose, as well as the method, was explained to the participants in order for them to make an informed decision about whether or not to participate in the research.

The data collection process was designed as follows: Each interview was intended to be performed face-to-face in a neutral setting and planned to be approximately 45 to 60 minutes long, which was considered to be enough time in order for the answers to reach the level of depth and detail that was needed for the research purpose. Before the start of the interview, a form of consent was handed out to each participant. After the permission of the interviewee was given, the interviewer started tape-recorded to enable transcription. The semi-structured topic list was used to guide through every interview. After the interview, the questions posed by the interviewer and the given answers were transcribed word-by-word. The transcripts of all 16 interviews have been made available with the thesis.

All interviews were held in English. Due to the fact that both conversation partners' – the participant's as well as the interviewer's – native language is not English, it was assumed beforehand that meaning could get "lost in translation". However, it was hypothesized that the level of English of all interviewees would meet the requirements needed to take part in an in-depth interview. As the transcripts reveal, interviewees and the researcher were occasionally missing expressions, but in none of the interviews were language barriers hindering the process of collective meaning-making.

It should be noted, however, that the asymmetrical power relation between interviewer and interviewee that arose out of the interviewees being elites might have impacted the interviewees' answers. The interviewer was well aware of the aspects that correlate with this kind of interview subjects. To overcome these challenges, the interviewer demonstrated a profound knowledge of the topic and used appropriate language to her best ability. Furthermore, she challenged statements where appropriate to go beyond the mere promotion of viewpoints – as it is often the case with elite interviews – and arrive at new insights (Kvale, 2007).

All interviews were conducted face-to-face either at the professionals' office buildings, the offices of Media Perspectives, or during events about data-driven content in Hilversum and Utrecht. With the exception of one interview that had to be ended earlier due to a change of schedule of the interviewee, all interviews took between 30 and 80 minutes. In the case of the stopped interview, a follow-up call was denied. With the exception of one interview, the full duration of the interviews was audio-recorded. In one case, the recording device (a smartphone) stopped recording after six minutes due to a lack of storage space. This was, however, only noted after the end of the interview. Therefore, the researcher took notes of everything that was recalled from the conversation and wrote a detailed outline of the interview. The outline then served as data to be analyzed. In all cases, the interview recording was transcribed shortly after the interview was held and all audio-recordings, as

well as all transcripts, were stored on several devices to be secured in case of data loss. All interviewees agreed to their name being fully published in this research. The interview partner from the Dutch government, however, requested no direct quotes and no statements from the Dutch governments to be published.

3.4. Data analysis

It was believed that professionals within the TV broadcasting sector perceive the changes in the market in a certain way, and this study is mainly interested in the way how these people interpret 'reality'. Therefore, a latent thematic analysis, as presented and discussed by Braun and Clarke (2006), was conducted, for which the answers were coded. Such an analysis includes the semantic content, but also looks at the ideas, assumptions, and ideologies that lay underneath (Braun & Clarke, 2006). The analysis process followed the six phases as proposed by Braun and Clarke: First of all, the researcher familiarized herself with the data. This was done by closely reading the transcripts and noting first interesting findings. Second, initial codes were generated by coding relevant text fragments. Hereby, it should be noted that coding started during the data collection phase and right after the transcription of the first interview. This helped to "generate an emerging understanding about (the) research question(...)" (DiCicco-Bloom & Crabtree, 2006, p. 317) and provided the opportunity to adapt the sampling and the interview questions to themes that started to stand out. The coding of the data was performed with the help of the software program ATLAS.ti and continued until inductive thematic saturation was reached. This was the case when no new codes or themes emerge from the data (Saunders et al., 2017). In a third step, themes were searched for and thoroughly reviewed.

In total, the coding process resulted in over 1.000 open codes of which some were combined. These codes were grouped into themes and some of them were neglected due to irrelevance. This lead to a reduction and connection of codes into sub-themes that reflected the most dominant elements of the data. After, the codes were connected to the literature framework whereby findings were reflected upon. In the end, seven themes, some of them consisting of several sub-themes, were arrived at. The themes are: *New media landscape, Big data's characteristics and benefits, Current application of big data, Barriers for extensive use of big data, Managing a successful adaption, Need of strategic change of direction, Ways to go forward.*

After the key themes, as described above, were identified, defined and named by the researcher, the findings were presented and connected to the existing body of academic work in form of a written report that can be found in the next chapter. The interpretation of the results intends to highlight key findings and answer questions about how the notions of big

data shift, how professional behavior changes, and how these actions affect or influence TV content.

3.5. Validity and reliability

In order to establish trustworthiness (Morse, Barrett, Mayan, Olson & Spiers, 2002), different criteria that meet the validity and reliability standards of qualitative research were applied to this study. First of all, the researcher ensured that the entire research process was well documented: Requirements of reliability and credibility are demonstrated by clearly describing how the interviews were held, recorded, transcribed and analyzed. Credibility is further taken care of by prolonged engagement of the researcher and persistent observation (Baxter & Eyles, 1997). Additionally, it was ensured that the work is methodologically coherent, made use of an adequate sample and that the researcher used an active analytic stance, as suggested by Morse, Barrett, Mayan, Olson & Spiers (2002). Due to the design of the research, this study had some difficulties to establish intercoder reliability. Since only one researcher analyzed and coded the data, this aspect of reliability could only be met in moderation by consulting the thesis supervisor about codes and agreeing on their values. In a transparent manner, the transcripts, as well as an overview of the professional characteristics of the interviewees are attached as an appendix (Appendix B). Overall, the researcher is aware of the iterative nature of qualitative research and its congruence is further ensured.

Validity was enhanced by asking questions that are based on different concepts as introduced in the literature chapter. Respondent validation was achieved by providing the interviewees with some of the results for review and confirmation. This, as well as source triangulation, was further enhanced by consulting about the outcomes of the analysis with Frank Visser from Media Perspectives. His feedback about the accuracy of the results was taken into account. Thus, the researcher ensured to stay accountable for a transparent research design to her best abilities.

4. Results

From the coding process, seven themes derived. These themes and the corresponding sub-themes are described in the following chapter. In order to understand how big data are currently affecting decision-making about content in the Dutch broadcasting industry, the attention is first drawn towards the new media landscape that the different players operate in and the implications that the current changes bring along for them. In a next step, it is outlined how data are handled within the industry. Then, space is given to the current fields of application of big data analytics for content. This entails a model of the content process in the broadcasting industry and the description of the current usage of big data for the single process steps. After that, barriers to an use of big data analytics are described and important factors in overcoming these barriers and succeeding in becoming more data-driven are stated. In the last step, it is discussed how companies within the Dutch broadcasting industry can stay competitive.

4.1. The new media landscape and its implications for Dutch broadcasting

As has already been discussed in Chapter 2, TV and radio used to be the industry's core products before the rise of the Internet. By now, the broadcasting industry identified new product opportunities and created online alternatives that serve as a "digital window to (a) new generation of viewers" (Maurits van der Goes, RTL, March 13, 2018). While the industry architecture is being "transformed by digitization and convergence" (Evens, 2010, p. 41), there exist two different kinds of narratives for the development of traditional players. While interviewees working for broadcasters describe their new practices as an online-first approach, moving away from online as "some sort of side dish" (Tim Zunneberg, Omroep Brabant, April 24, 2018), professionals with an external view on the industry criticize an inconsequent transformation process of most broadcasters:

> "There are two different kinds of products and they don't have any overlaps. They do their TV programs and a website. Of course, you have the videos of your TV programs on your website, but there the connection usually stops." (Erik van Heeswijk, Clever Lions, March 13, 2018)

In general, the interviewees see the transformation of broadcasting companies into multimedia companies happening slowly and inconsequently. It is agreed that the movement is held back "because they have a lot to lose. There's always this challenge. The business is still profitable" (Hans Bouwknecht, Dasym, March 22, 2018). The traditional broadcasting industry is attested a lack of entrepreneurial spirit that lets its players react under duress, but not proactively to the innovations of new market entrants. The lack of willingness to change might have to do with the new broadcasting eco-system being highly insecure. Changing

consumption habits furthermore led to a dependency on decisions of international players that dominate the online sphere and set the direction.

Audiences are perceived as being "used to have a kind of Netflix interface with a single point of entry and all content combined together" (Niels Baas, NLZIET, April 11, 2018). Thereby, the new digital channels changed the nature of broadcasters: What used to be a B2B business, with cable companies as intermediaries, developed into a B2C business. The development from TV as a mass medium to a direct medium leads to a new importance of understanding audiences and lets companies become more user-centric. The design of the interfaces, in other words, a successful customer experience, becomes a decisive element – if not the requirement to lead the field. With the new logic of user participation, as emerged from mobile and social media applications, responsive algorithms and a media structure that takes users into account are noted as becoming the new norm (Carah, 2017). This development is even described as a "war between the best customer journey, the nicest interface" (Nicolette Nol, KRO-NRCV, May 17, 2018) that the Dutch service providers are slowly losing. Furthermore, the importance of excellence in the field of user experience of digital products is highlighted: "If you are a seven everywhere, you are not making it" (Erik van Heeswijk, Clever Lions, March 13, 2018).

Interviewees emphasize how younger audiences do not think in channels anymore, but in programs. In the digital ecosystem, the link "between 'medium' and 'type of content' has been broken" (Evens, 2010, p. 42), leading to media companies thinking in content instead of mediums. In line with this, the aspect of building strong brands for their formats across platforms becomes more and more important (Bardoel & d'Haenens, 2008). This is the reason why many emphasize that broadcasting companies are required to develop an omnichannel approach, embed TV into a user journey that spans over channels, and improve the interaction between channels:

> "You should change more in stories instead of channels. I think that's the modern approach to it. Of course, television in itself is an important medium, I'm not putting that up for discussion. But the story is the story, not the channel is the story. It's not: 'The medium is the message', it's: 'The message is the message'. (Erik van Heeswijk, Clever Lions, March 13, 2018)

However, this is a vision that is not put into practice yet by the Dutch broadcasters since most content is still first and foremost created for TV. To succeed in treating stories agnostically, Erik van Heeswijk states that companies need a "holistic data approach" (Erik van Heeswijk, Clever Lions, March 13, 2018). Data can be used to identify the right channels for content brands and offer a basis for the modification of content for these channels. Dorine

van Mullem shares this opinion and believes "that data is the glue to actually make it cross-media" (Dorine van Mullem, Talpa, May 3, 2018).

4.1.1. Public and commercial broadcasters' ways of coping with change

A recurring topic in terms of reactions to the industry's digital transformation is the difference between public and commercial broadcasters. A lot of interviewees express the view that the two parties have different mission statements and business strategies that translate into a contrasting focus on consumer groups and different content strategies. While the public broadcasters have a clear task that is given to them by the Dutch government, to inform the public with independent and diverse content, the commercial broadcasters main goal is revenue – something they achieve by producing primarily entertainment content. The entrance of players such as Netflix as the biggest video-on-demand platform in the Netherlands apparently changed a system that was in balance before and is now discussed anew. As a matter of fact, the present imbalance of the Dutch broadcasting system proves that "each new advance in communications technology disturbs the established industry arrangements, challenging economic privileges as well as the existing legal apparatus" (Galperin, 2004, p. 162).

With the creation of their own advertising- or subscription-based video-on-demand services, broadcasters now have additional revenue streams. The according change of business models leads to the need to ensure the quality of customer relationships. Dorine van Mulem explains that Talpa TV, one of the commercial Dutch broadcasters, is creating value for consumers by improving the user experience. In shifting focus away from advertisers to consumers, commercial broadcasters are perceived as struggling. Daniel Hendrikse from FremantleMedia, a production firm that belongs to RTL Group, sees a mismatch between the increased dependence on advertisers due to financial pressure and the fan-centric focus of broadcasters on consumers. Because of the dependency on advertisers, he believes that "it's fair to say that all the advertisers and all the broadcasters keep this institution alive" (Daniel Hendrikse, FremantleMedia, April 20, 2018). A possible explanation for this might be the weakening of the traditional, advertising-driven business model by the cannibalizing practices of the new form of content distribution for their old channels and revenue streams. Financial pressure is further enhanced by the need for high investments in order to sustain the new business. Some interviewees even express the view that commercial broadcasters are threatened in their existence. Because of the financial dependency, the technological change of the commercial broadcasting system is decided upon by advertisers and the pressure to fundamentally change only increases if advertisers start to even more decrease their advertising spending on linear TV. The way of producing content for commercial

broadcasters is therefore currently highly dependent on advertisers "because that's where more money is" (Daniel Hendrikse, FremantleMedia, April 20, 2018).

As a "key cultural institution in Europe" (Bardoel & d'Haenens, 2008, p. 357), the public broadcasters are perceived as in a somewhat safer position than their commercial counterparts. They get their raison d'être directly from the government and receive funds to fulfill their task of creating cultural and educational programs that deal with Dutch language and culture. When it comes to a modernization of the system, many interviewees argue that the public broadcasters are staying behind and finding protection in their special status. The fact that commercial players in the Dutch market lead the field of innovation by inventing new formats has been explained by the public broadcasters' strict division of content in information and entertainment and the fact that formats are rather created for citizen than for consumers (Bardoel & d'Haenens, 2008). Nicolette Nol, who works for KRO-NRCV, sees this missing commercial aspect of the public broadcasting system as the reason for the lack of willingness and urgency to change. Tom van den Broek from the public broadcaster NOS leads this back to the financial security that he describes as somewhat luxurious. This shows the dilemma that the public broadcasters are situated in: Without the financial incentive, they are moving slowly. But most importantly, they are risking to become irrelevant for the newer generations:

> "If we don't pay attention, we will get overtaken by services and people won't notice us anymore. And then we have a really big problem." (Tom van den Broek, NOS, March 9, 2018).

Consequently, the importance to stay relevant for their audiences applies to the public broadcaster as much as it applies to their commercial competitors. There clearly exists an ongoing debate on best ways to achieve that. Gerard de Kloet from the NOS describes the reasoning behind the usage of Facebook for the content of NOS as another way to reach users. Because public broadcasters do not have commercial targets, "a view on Facebook in a video is worth the same as a view in a video on (their) website" (Gerard de Kloet, NOS, April 4, 2018). Being present on different channels has indeed been identified as a possible strategy for public broadcasters to "extend their trusted brands…as well as create greater loyalty and increase their chances of capturing a young audience and retaining it as it gets older" (Bardoel & d'Haenens, 2008, p. 353). However, Nicolette Nol also points out the difficulty in content being "scattered over different platforms that don't give you transparency of what is happening" (Nicolette Nol, KRO-NRCV, May 17, 2018). She compares the new services like WhatsApp, Facebook, or Instagram with a black box. Just Vervaat, working for the NPO at the time of data collection, further explains the difficulty in using third-party

services as communication channels for public content because the mediation of public values cannot be ensured on other services than their own.

Eventually, the different stages of commercial and public broadcasters within the industry foster a competitive relationship between the two parties that also expresses itself in the way they handle data. Niels Baas' explanation of how data are dealt with at NLZIET, a cooperation between NPO, RTL, and Talpa, exemplifies this:

> "They don't want to talk about data. That's more from the competition side of view or something. I give everybody their data, but the market shares of the different broadcasters are not being discussed here." (Niels Baas, NLZIET, April 11, 2018)

4.2. Perceived characteristics and benefits of big data

The phenomenon of interviewees discussing data as a competitive advantage that can be translated into monetary value derives from the belief that data are the industry's future core business. Data are expressed as a necessity for the industry and something that should be used as "a core tool" (Erik van Heeswijk, Clever Lions, March 13, 2018). The statements of the interviewees showcase the institutionalism within the industry (Lowrey, 2011), whereby players adapt to new standards and orientate themselves towards bigger players. This tendency indicates that their "attitudes are driven by a fear of being left behind" instead of "a genuine belief that big data can have a positive creative and cultural impact" (Kelly, 2017, p. 3). Overall, interview partners agree with academics that data are the enabler for organizations to pursue digital transformation (Lippel, 2016) and are by now "an integral part of televisual culture" (Kelly, 2017, p. 3).

With the goal to maximize relevance for the consumers and gain real-time insights, data that can be acquired online clearly become the center of attention for the interview partners. Before the rise of big data, the impact of formats was guesswork, as Kasimir Landheer's explanation of vague success measuring practices shows:

> "We think we might make great videos or great formats, but we don't really know. I mean, we know it on TV when a lot of people are watching, but then, you know, it's so… We all know that the way that TV is measured is quite bold. It's probably alright, but nobody really knows, I think." (Kasimir Landheer, FremantleMedia, March 6, 2018)

Big data insights are perceived as more granular and rich compared to traditional measurement methods and therefore believed to offer more focused advice. Furthermore, they are seen as helping to make more fundamental and more informed decisions. Being described as facilitating a "360-degree view of what's happening in the world" (Maurits van der Goes, RTL, March 13, 2018), big data are perceived as delivering certainty in a more

complex media environment. It is argued that due to the diversification of channels, formats, and user groups, a need for data is created because "that cube, that puzzle is far too complex to be solved only with your gut feeling" (Erik van Heeswijk, Clever Lions, March 13, 2018). Data are perceived as superior to gut feeling because they presumably offer clearer insights that can be treated as evidence, as Hajo Wielinga's description of the decision-making practices at RTL shows:

> "So not: 'I have the feeling that this will work!', I want arguments for that. – 'Do you have the data? And can you please tell me why you think that this is working?'" (Hajo Wielinga, RTL, March 21, 2018)

The overall trend to data mythology and dataism, as identified by boyd & Crawford (2012), is clearly apparent in the industry. In line with this, Leon Backbier describes algorithms as "straight" and "strict" (Leon Backbier, Endemol, May 8, 2018) – unlike humans, who might be less consequent in their decision-making. For Kasimir Landheer, the benefits of big data in comparison to human abilities are a matter of scope:

> "She (an editor) is really good at her job but that the tool definitely adds something because she just hasn't – as a human cannot have the same scope as the machine has." (Kasimir Landheer, FremantleMedia, March 6, 2018)

While big data are discussed as superior to human analytical skills, the awareness of potential pitfalls remains recognizably low under the participants and shows "the television industry's seemingly uncritical acceptance" (Kelly, 2017, p. 4) of the new paradigm. Just Vervaart raises the issue of potential algorithm bias – something that he cannot ensure for the algorithms the NPO builds in-house. He explains that this topic is almost non-existent, even though it comes along with a high degree of political power:

> "Nobody is ever...approached me, saying: 'You're recommending stuff to people. Is there a bias in your recommendation?' Because…I could reach millions of people. I'm not governed. That's a scary thing. So we think we're doing it, but there could be a bias in there that we are not even seeing at the moment." (Just Vervaart, NPO, March 8, 2018)

4.3.   Current application of big data

The current degree of big data application within the respective companies amongst other things depends on the availability of external as well as internal analytical tools. While "major Internet firms such as Google, Amazon, and Facebook continue to lead the development of web analytics, cloud computing, and social media platforms" (Chen, Chiang & Storey, 2012, p. 1169), many interview partners report to cooperate with these tech firms and use their services for their own purposes. Here, also, dataism becomes apparent in the form of "trust in the (institutional) agents that collect, interpret, and share (meta)data culled from social

media, internet platforms, and other communication technologies" (Van Dijk, 2014, p. 198). However, there also exists a trade-off between these one-fits-all tools and the unique needs of the broadcasting and production companies. When the deficits are perceived as too high or the offered degree of customization as too low, media companies start building their own tools. Being part of an international company hereby was noticed to be advantageous for the state of data use and literacy of the company. The advancement is also connected to the size of the IT and data department of the company.

Overall, the interview partners reported that within their companies, data are frequently used for business monitoring. This already indicates a process of institutionalization of data analytics, that is, algorithms (Napoli, 2014). In general, it is noticeable that the possession and usage of data plays a bigger role for the commercial broadcasters than for the public ones because "direct data give them possibilities to create more granular and personalized advertising" (Niels Baas, NLZIET, April 11, 2018). While commercial companies are observed to be fond of using data to predict the business performance in advance, for example by gaining consumer intelligence to forecast viewing numbers, public broadcasters are reported to frequently apply the wrong key metrics to measure success. Because of this, Erik van Heeswijk draws attention to the importance of using the right data for business decisions:

> "We try to show only the data that is important for that specific decision… I frequently don't use the term big data, I use the term smart data because it says a lot more about selection of data points instead of more and more." (Erik van Heeswijk, Clever Lions, March 13, 2018)

4.3.1. Current use of big data for content

As the analysis showed, data insights are not commonly affecting content processes yet. Within the Dutch broadcasting industry, so far, many big data initiatives are project-based and are still tested on a small scale. Even though the majority of interviewees states that data insights are not part of their daily practices, they unexceptionally describe big data analytics for content as an untapped opportunity that offers great benefits because of its potential to make content more relevant for its audiences. Thereby, the interviewees follow Erik van Heeswijk's opinion, who advocates that "data should be a more integral part of content strategy" (Erik van Heeswijk, Clever Lions, March 13, 2018).

The willingness to incorporate a more data-driven approach to content might be present within the industry, but relates back to "institutional stasis" (Lowrey, 2011, p. 75)) and isomorphic tendencies. An indicator for this insight are the periods of time that interviewees were either holding their position within the company or working on projects that they reported on during the interviews. Leon Backbier from Endemol started a data-driven content

project in October 2017. Dorine van Mullem from Talpa works on a data strategy for the broadcasting network since November the same year. Kasimir Landheer and Daniel Hendrikse had their new positions created in January 2018, after FremantleMedia restructured their linear and digital teams. Others report on projects that are being tested in the upcoming months.

In terms of possibilities to adapt big data insights to content, the interview partners clearly differentiate between different kinds of content and the respective medium. They point out that every medium has its own requirements that have to be taken into account during the content process and distinguish between levels of creativity. The production of online news, as happening on the editorial floors of broadcasters, is compared to "craftsmanship" (Erik van Heeswijk, Clever Lions, March 13, 2018), but video "is perceived more as the place for creativity than articles are" (Erik van Heeswijk, Clever Lions, March 13, 2018). This differentiation in terms of degree of creativity has to be taken into account when looking at the different fields of application of big data.

Big data invading the creative world
Different stages of how consequently big data analytics are applied to content became apparent. It can be assumed that this is linked to the differences in companies' mindsets. This is showcased by Erik van Heeswijk who explains the difference between raw data and actual insights, which he refers to as tips:

> "Numbers are patient, while tips are very intrusive. They tell you what to do…These tips…are perceived as a software breaking into their creative world. It depends on where you are on the maturity scale if you accept that sort of solution." (Erik van Heeswijk, Clever Lions, March 13, 2018)

In many cases, the incomprehensibility of big data, as can be explained by the Kantian mathematical sublime (McCosker & Wilken, 2014), is perceived as invasive and restricts an enhanced use of data throughout the company. Therefore, there exists the necessity to break big data insights down and humanize analytical tools (Lippel, 2016) for employees without the required technological background. Erik van Heeswijk explains how his company developed a software with human-like traits that are supposed to build up trust between the users and data tools:

> "We try to conceal that it's big data, because it's scary stuff, right? It's all that numbers and we designed a very friendly octopus which blinks with its eyes – very cute… That's the basis. The rest is for more advanced users. Of course, we have these giant graphics… But I consider that 70 or 80 percent of the people don't want to know. They just want a left or right… And that's our main objective. To be that trustworthy

and smart that people just trust the tip." (Erik van Heeswijk, Clever Lions, March 13, 2018)

Additionally, interview partners counteract the invasiveness of big data by narrating big data in a specific way: It is stressed by the interviewees that technology lacks the element of surprise and the ability to create emotions. This is, in their eyes, why creativity and therefore humans and their gut feelings are still needed. Big data on the one hand and creativity on the other hand are reported as two universes that – especially in the eyes of creatives – often clash with each other. Leon Backbier describes the process of data adaption by Endemol's writers as follows:

"First, you see it as a threat. But in the end, you have to see it as an input source to improve the writing." (Leon Backbier, Endemol, May 8, 2018)

Big data are communicated as an add-on, an assistance to work more effectively, or a validation of gut feeling. The job of creatives, in contrast, is described as creating feelings and storylines that carry emotions. Thereby, it is also stressed that the power of decision-making still lays by the creatives and that the interpretation of big data insights remains open for discussion. Consequently, it very much seems like data are narrated as an empowering tool for creative processes while the decision-making authority still belongs to the media professionals. Erik van Heeswijk expresses the opinion that the real value for content lays in the combination of data and emotional feelings:

"You have to compose those two. It's not only about data, it's not only about gut feeling. Combining these two is what is really powerful." (Erik van Heeswijk, Clever Lions, March 13, 2018)

The content process

In general, the content process can be described as "topic detection, production, distribution, analysis, results" (Erik van Heeswijk, Clever Lions, March 13, 2018), and traditionally involves a variety of different companies. In this work, it is even argued that the step-by-step-process as described by van Heeswijk can be seen as a loop, whereby data theoretically offer the possibility to let results affect the first step, the decisions about what content to produce (see Figure 1). The analysis, however, has shown that big data are not used to create this loop yet and are deployed in varying degrees to the existing stages. In the following, the state of big data usage of these separate steps and possible reasons for the use or neglecting of big data are subsequently laid out.
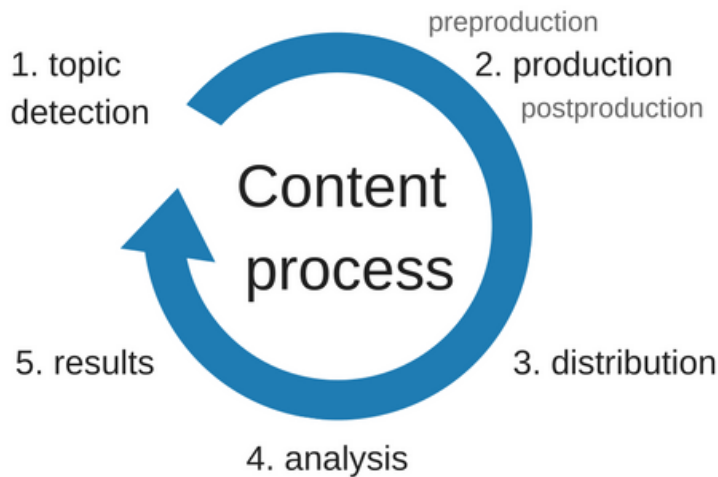
Figure 1: The content process

Big data for topic detection

When content creators enter the stage of topic detection, the "concept and format development" (van der Groep, 2010, p. 847), decisions are made about what type of content to produce or buy. In this regard, one field of application of big data insights is the possibility for customer segmentation on digital platforms. Content is then produced and licensed according to the needs of these customer segments. In this approach, Nicolette Nol sees parallels to Netflix' strategy and states the diversity of content to be negatively affected by this practice. This also raises the question if this is the right way to stabilize the broadcasters' future. Hendrikse (FremantleMedia) sees a difficulty in this form of content strategy, as mostly applied by commercial broadcasters to their online platforms:

> "What they are doing right now is building up on that momentum. Eventually, probably, the momentum is going down. This is how RTL is determining their long-time strategy. Which, in my opinion, is short-sighted." (Daniel Hendrikse, FremantleMedia, April 20, 2018)

Another possibility to facilitate topic detection is offered by social media insights. While Kennedy (2015) sees social media monitoring as "a spectacular manifestation of the monetization of culture" (p. 2), Erik van Heeswijk describes the use of social media analytics as "the easiest part" of big data insights and criticizes their use by media professionals who might not really embrace data-driven decision-making about content yet:

> "These are the kinds of non-intrusive tools that they love. It doesn't tell you what to do, it just gives you examples. It's quite light, fluffy, and nobody gets scared of topic

detection. And they can tell their bosses: 'We are very data-driven. Look, we have a
data tool.'" (Erik van Heeswijk, Clever Lions, March 13, 2018)

Kasimir Landheer explains that FremantleMedia is currently testing different possibilities with
"tools that are based on audience interests and audience profiles" (Kasimir Landheer,
FremantleMedia, March 6, 2018) but admits that the content that is "data-inspired but not
necessarily data-driven" (Kasimir Landheer, FremantleMedia, March 6, 2018) makes up only
a small percentage of their productions.

For public broadcasters, however, big data do not seem to play a notable role in topic
detection. The rise of digital communication channels appears to raise concerns about a
potential decrease in content quality. Another reason is that the main objective of public
broadcasters is not profit maximization, but educating and informing the public with content
that is considered as entailing public value. Therefore, interviewees working at public
broadcasters seem to debate the implications of big data insights of consumer demand:

> "We're also not here as a public broadcaster to just give you what you want. And give
> you more amusement or more cat movies. We should also be able to add something
> to your...and that sounds very high brow, but add something, add value, to your life."
> (Just Vervaart, NPO, March 8, 2018)

The ability to receive direct feedback of what kind of content works in the online sphere also
lets interview partners reflect on their raison d'être, as this quote by Tim Zunneberg about
their online news content shows:

> "One of our big celebrities is Sylvie Meis, who is also famous in Germany and you
> can publish a story about her almost every day. But is that really why we are on
> earth?" (Tim Zunneberg, Omroep Brabant, April 24, 2018)

Instead of taking viewing numbers and clicks into account for decisions about content,
aspects that relate to quality, such as consumer loyalty measured in time spent or returns to
the website, rise in importance for these kinds of decisions.

Big data for content production

When it comes to content production, the interviewees especially emphasize the differences
in mediums. The analysis of the data indeed verified that there exist different levels of big
data application for the forms of content. It became apparent that big data analytics already
play a substantial role in online news. Different tools are used to track clicks, but also to
detect the scroll depth or test headlines. With the aim of creating a feedback loop and
improving articles to attract more readers, journalists recognize the possibility to change
content instantly online. Thereby, the tools are not only used to make statements about the
complexity of content that can potentially be reduced by shorten text to make it more

readable, but also to detect the 'correctness' of content. The phenomenon of media professionals stating data to be able to detect 'right' from 'wrong' is a reoccurring pattern within the data and shows how the perceived characteristic of big data analytics to give clear signs, either a 'yes' or a 'no', is used by newsrooms to make decisions. In the case of online articles, big data analytics help content creators to perform the balancing act of deciding what content is 'newsworthy' and adapting it in real-time to the readers' needs:

> "If you write a story, you check if it's being read after it's published. And if it's not, you have to change things. Not because you did it wrong, but because you made a different decision than the reader wants. So you can tweak and fix things on your story while it's being published." (Gerard de Kloet, NOS, April 4, 2018)

Video content, however, is characterized by a longer and more complex production process and is therefore not as easily 'tweaked and fixed' after its completion as text. On linear TV, the producers are not in control of their work anymore once it has been published. Consequently, the inflexibility to react to possible audience feedback leads to interviewees reporting that colleagues working for linear TV have not yet expressed interest in big data insights but mainly still focus on viewing numbers. At the public broadcasters, linear content is, as Just Vervaart confirms, not affected by big data insights yet. Furthermore, he also affirms that "the data from the on-demand platform it's not used to enhance the understanding of which shows are doing good or bad yet" (Just Vervaart, NPO, March 8, 2018). Nicolette Nol from the public broadcaster KRO-NRCV, however, explains how she incorporates the target audiences feedback into the content creation process not with big but with small data. She uses the example of a WhatsApp project for children about bullying to demonstrate how they test new formats qualitatively with focus groups. She reasons this approach by explaining how programs traditionally were created without direct feedback, but how today's oversupply of content makes interaction more important because it helps content creators to find blind spots in their thinking:

> "We live in different times now… Before, there wasn't any interaction. So I think with the enormous amount of content that you can consume during a day, it's better to create content with people that are going to listen to it or watch it." (Nicolette Nol, KRO-NRCV, May 17, 2018)

This, however, can only be achieved by an all-encompassing reorganization of production habits and chains which would, in turn, lead to a change of tasks for content producers and would entail more effort for them. The results of this research indicate that the industry is still far away from achieving this turn for TV productions in the near future. Producing content in

intervals and testing different aspects of a story that are traditionally decided upon by media professionals is only thought about but not put into practice yet.

One form of content where this new approach seems most applicable are daily soaps and series. As a matter of fact, Leon Backbier from Endemol reported the only case of all 16 interviewees where big data insights affect storyline mechanisms. What started as a project to predict viewing ratings more accurately with the consultation of social media data and scripts developed into a tool that can now predict viewing rates for different storylines of the daily soap 'Good Times, Bad Times'. In contrast, some interviewees express the view to leave the storyline untouched by data insights. They see the possibility of data insights to change some, but not the core elements of the story. Some elements that they envision to be affected by data insights – but are not as of today – are decisions about the fit of cast. Here, the future possibility to employ big data insights to learn about which cast members "are the most popular or generate the strongest emotions" (Maurits van der Goes, RTL, March 13, 2018) is seen.

Big data for content distribution & discovery

Big data for content discovery was one of the most dominant topics within the data. The dominance of big data for content distribution in form of recommendation systems is associated with the fact that NPO, RTL, and Talpa, the broadcasters within the sample of this study, produce the minority of their content themselves but commission either the public broadcasters underneath themselves, in the case of NPO, or several production firms within the Dutch broadcasting landscape such as Endemol or FremantleMedia. Therefore, they do not have many possibilities to let content production be influenced by data and have to make data efforts in other areas. However, these efforts were only introduced recently: NPO started their recommendation engine for their website in the middle of 2017 and Talpa is relaunching their digital platform with personalized recommendations in September of 2018.

It is, therefore, safe to say that the Dutch broadcasters are currently focusing on personalized recommendations that "create a routine flow of data" (Carah, 2017, p. 386) because they perceive data to be highly useful for a personalized environment. The focus on the trend of personalization of content discovery is related to the shift of broadcasting "from a mass media to a direct media perspective" (Dorine van Mullem, Talpa, May 3, 2018). In other words, it is used to enhance the customer experience with the aim of increased customer loyalty. However, since recommender systems are "currently ubiquitous" (Constantiou & Kallinikos, 2015, p. 51), it also indicates an isomorphic tendency of the industry whereby the Dutch broadcasters feel the need to adapt to new standards:

"We have to get this personalization in place. I don't think personalization is the silver bullet. I don't think [pause] it will make us the biggest and best for all time, but I do

see with all this competition – not only on news but also on other products – people are getting used to products shaping around their interest." (Tom van den Broek, NOS, March 9, 2018)

Since more and more cultural content becomes unlimitedly streamable, the process of infomediation that is facilitated by recommendation services and algorithms plays an increasing role for companies to differentiate themselves (Morris, 2015). The importance to fulfill consumer expectations lets personalized recommendations seem as a way to lead the consumer through the overwhelming mass of content. Thereby, the curation of content is conceded to algorithms and it is supposed that consumers do not want to make these choices themselves:

"There is so much content, you don't want to make those choices anymore. So within this pile of content that we have available, we have to filter out the possible shows that could be interesting." (Maurits van der Goes, RTL, March 13, 2018)

Overall, personalized recommendations are narrated as bringing 'the right content to the right people'. But even though the technological differences between the recommendation algorithms of public and commercial broadcasters are perceived as minor, the cultural dimension of making decisions about content consumption for the consumers is something that the public broadcasters seem to be more aware of. They recognize the different motives that underlie the content discovery efforts of both parties and turn "the debate on algorithmic curation into a discussion over the quality or accuracy of machine recommenders" (Morris, 2015, p. 448). Unlike the commercial services, who aim for more time spent within their product and therefore optimize for likeliness to watch, public broadcasters have to take their public task into account and are following a 'willingness to watch' approach. Thereby, they compare the usual recommendation systems with "a one-way street where you get stuck in your own interests" (Tom van den Broek, NOS, March 9, 2018) that reinforces opinions. Instead, they express the aim to broaden peoples horizons by recommending diverse content. However, the analysis showed that they struggle to translate their public value into recommendation algorithms:

"The first thing we would like to do is to show them something completely opposite of what they are watching. But that's wrong because they are never going to watch that. Somebody who watches a documentary about art in the 70s is never going to watch a soccer show. So we have to find something they don't watch out of themselves and are willing to watch." (Just Vervaart, NPO, March 8, 2018)

This difficulty has to do with the hamburger-system, as Bram Voermans calls it. Attracting the Dutch public to programs that are perceived as highly culturally valuable or educating was traditionally solved by programming 'lighter' and 'more heavy' programs behind each other

on linear channels. Trying to achieve the same system with their recommendation algorithms directly leads the public broadcasters to the difficult question of "What is the responsibility of the public broadcaster?" and "What way do you want to educate people?" (Just Vervaart, NPO, March 8, 2018). The public broadcasters are therefore demanded to find a way to translate public value into algorithms in order to not risk to become part of the commercial tendencies of the industry.

Furthermore, Just Vervaart points out the needed transparency in communicating how these algorithms are built. The public broadcaster, in his and Bram Voermans' opinion, needs to be able to demonstrate how values are reflected through the new access to public content. Hereby, the perceived beneficial characteristics of algorithms, as shown in section 4.2., enclose to become problematic, because "data science doesn't care whether it's a public program or not" (Niels Baas, NLZIET, April 11, 2018).

4.4.   Barriers for extensive use of big data for content processes

Throughout the analysis of the interviews, multiple challenges became apparent that prevent a stronger application of big data insights for content. The traditional players within the Dutch broadcasting industry can be classified as aspirational in becoming data-driven. It has been acknowledged that such companies often lack "the necessary building blocks — people, processes or tools — to collect, understand, incorporate or act on analytic insights" (LaValle, Lesser, Shockley, Hopkins & Kruschwitz, 2011, p. 22-23). The identified barriers are mainly to be found within the companies and are primarily connected to resources of different kinds, namely time, money and especially talent. The interview partners agree with authors such as Lippel (2016) that the European labor market currently fails at providing the needed number of data professionals.

There furthermore exists high consistency within the interview data about the need for more content intelligence. Media professionals have the ability to collect sufficient user data, but miss the possibility to analyze the metadata of their own content and combine it with user insights. This perceived need seems to be especially high for video content, since text tools, like analytical tools for articles, are already better established. An important factor for the lack of ability to conduct analysis such as sentiment analysis for subtitles, topic distraction, or image recognition, is the diversity of content. Media professionals obviously struggle to find or build the right tools for their website content, digital videos, shows, movies, series, and soaps. Next to the difficulty of diverse content, the interviewees also report to struggle with content not being "labeled well enough to do this kind of analyses" (Nicole Engels, NPO, March 21, 2018). The question what changes in content production would be needed to structure content in a way that allows the application of algorithms is something that is already thought about but not yet followed up on:

> "Are the learnings we have enough to make them invest upfront into a structured way of creating scripts? If it's always the same, we have the benefit afterwards." (Leon Backbier, Endemol, May 8, 2018)

Making video searchable is another ambition of the industry. This is seen as a potential opportunity to improve manual workflows, for example by creating searchable video timelines with the help of data visualizations.

4.4.1. Data sparsity and data silos

In many cases, the lack of data was named as one of the biggest hurdles for a successful adaption of big data analytics. In the case of the regional public broadcasters who provide their content to the NPO and therefore do not run many own digital channels, "there is not enough data to actually analyze something" (Nicolette Nol, KRO-NCRV, May 17, 2018). But professionals working at RTL, a broadcaster that runs the digital platforms RTL XL and Videoland, report data sparsity too.

While data volume might actually be insufficient in some cases, another reason for the perceived data sparsity could be the widespread existence of data silos between different departments or stages of the content process, but also within the whole industry. These data silos partly explain the superficial application of big data analytics: Within companies, various roles and tools are involved in the content process and the combination of insights from the different datasets, tools, and teams is absent in the majority of cases. Nicolette Nol misses a clear structure behind the current data collection practices and feels that this is holding back real insights:

> "At this moment, there are a lot of tools to collect data, but it's all over the place, so it's difficult to actually learn something from it." (KRO-NCRV, May 17, 2018)

When working with isolated data, media companies risk arriving at the wrong conclusions. While Erik van Heeswijk believes the 'data fetish' to be omnipresent, other participants report different approaches to data by different departments. Therefore, the merge of data silos in one data approach that gets rid of the strategic mismatch is demanded. Visions for a data strategy already exist, but do not seem applicable yet.

An additional reason why production companies like FremantleMedia or Endemol are not yet able to thoroughly apply big data insights to decision about content production is the fact that they do not hold the rights to the content once it is sold to their clients and therefore lack data about the viewing numbers and viewing behavior. Producers believe that they would be able to "draw sharper insights and conclusions from that" (Kasimir Landheer, FremantleMedia, March 6, 2018) but are instead missing the feedback loop of knowing what content works well for their audiences. Because of this, they have to rely on recommissions

from their clients as one of the only signs of success. While many broadcasters are perceived to not want to share the data with the commissioned production firms, this specific data silo is also partly created by existing laws and regulations that forbid the exchange of data between companies.

4.5. Managing a successful adaption

In order to manage the technological and cultural change, the broadcasting industry needs to go through a comprehensive transformation. In fact, interviewees speak about a required change of company DNA. This entails not only the strive for a "culture of improvement" (Erik van Heeswijk, Clever Lions, March 13, 2018), but also the need to overthink current habits:

> "We have a couple of customers that are really into revisiting all of their assumptions that they have and they are the ones that are doing very well. Not because of data in itself, but because of their transformation into a curious flow of becoming more effective." (Erik van Heeswijk, Clever Lions, March 13, 2018)

This shows that broadcasters eventually have to change their core business and develop into IT companies to stay competitive. While the interviewees agree that existing employees will start to see the benefits of big data with an increased use of it and start to learn "that it's normal that things are changing" (Gerard de Kloet, NOS, April 4, 2018), some especially emphasize the need of new skill sets:

> "The skill set to really perform well on a digital platform as a company is a completely different skill set than performing well just by producing and broadcasting content." (Hans Bouwknecht, Daysm, March 22, 2018)

To capitalize on big data and "meet future market needs" (Johnson, Friend & Lee, 2017, p. 646) academics agree that organizations need to take the time to work on their skills and mindsets (Constantiou & Kallinikos, 2015). In order to achieve that, broadcasting companies do not only need young talent with a different problem-solving approach, but also a visionary management. Many interviewees, directly and latently, talk about the importance of top management in regard to those transformational processes and share the opinion that without the involvement of the management level, big data implications stay on a superficial level. So far, however, data adaption and innovation within the companies that were object to this study is driven by individuals, not management. CEOs and other managers on or below C-level are reported to lack the technological background "to have an idea on big data and what to do with it" (Erik van Heeswijk, Clever Lions, March 13, 2018). For them as much as for every other non-data-expert, data remains opaque – which in some cases even leads to dismissiveness of the whole issue. They either do not know what questions to ask, or a lot of knowledge gets lost in 'translation'. Therefore, a new management skill is required:

> "Even if you hire the smartest data scientist, it's very hard to understand them, to have them function on the mission of the organization. Managing big data organizations or big data departments is a skill in itself, which is not very present at media companies." (Erik van Heeswijk, Clever Lions, March 13, 2018)

Acquiring data literacy and being critical about data insights, therefore, are believed to be decisive managerial characteristics for the future success of these media companies.

In order to become more data-driven or put data projects into practice, many interviewees tell about internal restructurings such as regular meetings with other departments to overcome data silos, shortened time frames for different development processes, or the creation of new functions. There also exist traces of entrepreneurial practices within their explanations. This, for example, entails setups of independent data units or think tanks to overcome the risk of being slowed down by existing structures. Such centralized units or teams that are not object of daily concerns "make it possible to share analytic resources efficiently and effectively" (LaValle, Lesser, Shockley, Hopkins & Kruschwitz, 2011, p. 28) and allow for brainstorms and try-outs:

> "We don't have this major deadline of this program that goes online or live every day. So we have the time and the mind space to think about these things." (Nicolette Nol, KRO-NRCV, May 17, 2018)

There is consensus between the interview partners about the difficulty of transforming data insights into actions. Having followed the principle of data harvesting, as exemplified by their main competitors, they now lack a clearness of how to derive value out of the data:

> "There is no value in collecting data by itself. We all have data, right? Millions of piles of data, every media organization has them. It's translating this data into a decision that you as an editorial team can make and is quite understandable for everybody on the editorial floor." (Erik van Heeswijk, Clever Lions, March 13, 2018)

So how can a rather habitual data usage be promoted? Of course, there exist different possibilities that could help to make data insights more actionable and scale it down 'to the floor'. In any case, trying to break existing institutional mechanisms such as routines of employees (Constantiou & Kallinikos, 2015) to enhance a data-driven mindset is one of the main difficulties for managers. Tom van den Broek reports challenges to engage his colleagues that derive from daily practices and a lack of mental space:

> "You see, these people have daily concerns about what to publish and what not. Really operational stuff, you know? And we from the department here have another horizon… I think it's part of my job to…break them out of this daily routine. Which is a

very important routine, but not when planning a product." (Tom van den Broek, NOS, March 9, 2018)

The dominating strategy to overcome these challenges seems to be data visualizations for the editorial and creative teams in the form of dashboards. Interviewees explain how they conceal the size of data sets and make data "presentable" or "digestible" with user interfaces. This form of minimization and humanization of data aims at making big data insights independent from expertise or professional background and is perceived as becoming increasingly valuable (LaValle, Lesser, Shockley, Hopkins & Kruschwitz, 2011). Researchers indeed verify that data are "frequently consumed in aesthetic and symbolic form" (Kennedy, 2015, p. 1) – especially in industries related to Internet and media (McCosker & Wilken, 2014). That data visualizations become a cultural practice is for example argued by Kennedy (2015), who suggests understanding "data visualizers as cultural producers" (p. 6). Leon Backbier, however, who also works with this form of visual presentation at Endemol, warns about the risk of arriving at the wrong conclusion when complexity is taken out and people are not educated about the context:

> "If social media is giving the sentiment 'very bad', 'very negative', it's not a bad thing. It's generating traffic and that's good. But if you don't know that and you don't take that into account, you can make the wrong decisions." (Leon Backbier, Endemol, May 8, 2018)

Because of the complexity of big data, some participants are of the opinion that big data analytic tools should not only visualize data but also give recommendations. The lack of clarity can be counteracted by a translational process that turns data into action items. Decisions about relevance are made by the tool and only relevant information is surfaced. Furthermore, the continuous adjustment and improvement of data tools to the daily routines of media professionals is used as a strategy to overcome mistrust in data tools and arrive at a more data-driven mindset. Participants explain that they are working on creating a feedback loop with the editors and creative staff about the perceived usefulness of tools. The attempt to make the tools as useful as possible for non-tech employees goes as far as adopting a personalization strategy that resembles the personalized services these media companies offer to their users. This becomes apparent when Erik Heeswijk speaks about the importance to deliver the recommendation "to the right person" and in their preferred device:

> "It's not a question of building a dashboard and they log in and see what is going on. It's sending that tip to their mobile phones, for example. Or in WhatsApp, or in Slack." (Erik van Heeswijk, Clever Lions, March 13, 2018)

4.6. The need for a strategic change of direction

The identification of a superficial application of big data for content, isomorphic tendencies of the industry, managerial struggles, and the like, suggests that in most cases, traditional players of the Dutch broadcasting market operate without a clear strategy at hand. While academic literature expresses the lack of well-developed Internet strategies of broadcasting companies (Bardoel & d'Haenens, 2008), it can be argued that the same holds true for possible data strategies. This is confirmed by the interview partners. Maurits van der Goes, for example, expresses the opinion that a lot of companies created "data harvest environments" (Maurits van der Goes, RTL, March 13, 2018) without knowing what the aim of these big data efforts is – an aspect that is considered to be "more important than ever" (Lippel, 2016, p. 258). Especially, interview partners that work as external advisors mention a lack of clear vision of their customers and describe efforts that entail big data collection and analysis as unaligned and not connected to a bigger aim.

Instead of accepting that big data "challenge many of the canons of standard, prescriptive approaches to management and strategy" (Constantiou & Kallinikos, 2015, p. 45) the observed media companies in this study stick to a 'strategy-as-practice' and continue to work with a deductive approach that has been prevalent in the industry since decades: creating content and distributing it top-down. Media companies are busy with keeping up appearances instead of strategically assessing their environment (Lowrey, 2011). They miss the fact that in the new dynamic environment, big data can deliver short-term insights and have the potential to identify changes quickly – especially in user needs and demand – and choices cannot solely be based on experiences of past solutions anymore (Constantiou & Kallinikos, 2015). Apparently, broadcasting companies have not found a way to incorporate these insights into their long-term strategies in a flexible and adaptive way yet.

To use data effectively, companies have to reconsider their approach to strategy-making and become proactive in approaching changes. The transformational developments within the global broadcasting market ask for an integration of insights that resembles a bottom-up approach. Apart from budget reallocation and a modification or replacement of existing tools and models (Constantiou & Kallinikos, 2015), this also entails a change of working culture and management practices – aspects that all companies within this study struggle with the most. Erik van Heeswijk is sure that "the winners of this are going to be the people that make their own strategy" (Erik van Heeswijk, Clever Lions, March 13, 2018). This view is also expressed by Spillane (2012), who argues that "data do not objectively guide decisions on their own—people do" (p. 114).

Erik van Heeswijk stresses the importance of consequence in strategic execution: The strategic course needs to be "calculate(d) to the floor" (Erik van Heeswijk, Clever Lions, March 13, 2018) and translated into algorithms and metrics instead of the other way around.

If applied correctly, algorithms should, therefore, be built in a way that makes them "the DNA of a media brand" (Erik van Heeswijk, Clever Lions, March 13, 2018) that responds to the mission statement of the broadcasting companies who apply them.

4.7. How to stay competitive

When talking about future plans, the majority of respondents raises the topic of the market lead of Netflix. They see the company as the benchmark that they need to compare themselves with. Thereby, the ideas of a successful way of competing with the tech giant differ, but show how the SVOD platform is mystified. As the main competitor for every single player within the Dutch broadcasting market, Netflix' competitive advantage, as stated by the interviewees, consists of a different DNA, more experience in the digital field, high-quality content, technological stability, deeper user insights, a higher quantity of content, and higher budgets. Within the notion of being outperformed, commercial broadcasting companies again show isomorphic tendencies. Hajo Wielinga from RTL is aware of the resemblance of their services and the similarity in mission statements:

> "We are trying to understand why we are different than Netflix because we are not exactly the same. But we are doing the same thing and you can compare the interfaces of Videoland and Netflix, they are similar." (Hajo Wielinga, RTL, March 21, 2018)

His statement offers insight into how the interview partners try to turn their different backgrounds into a unique selling point. One aspect that is mentioned frequently in this regard is local content. While commercial players come up with a competitive strategy that tackles Netflix' dominant position on an international level, public broadcasters have an opposite direction in mind. They think that "it's not very realistic to compete with Netflix" (Nicolette Nol, KRO-NCRV, May 17, 2018) and therefore see the different mission statements as the reason to not align their practices to the SVOD platform. But Tom van den Broek rises the issue of user attention. In his eyes, people have different incentives to consume content from NOS than from Netflix, but the two services still compete with each other because "Netflix is eating away people's time, and time is a very important metric for us" (Tom van den Broek, NOS, March 9, 2018). He concludes: "When you boil it all down to time spent, you are competing with everyone" (Tom van den Broek, NOS, March 9, 2018).

4.7.1. Joining forces

Because of the internationalization of the broadcasting market, as agreed upon by the interviewees, a certain scale is needed to successfully innovate and meet the competition. In many cases, cooperation between different parties is described as a must to reach the required impact. Their assessment coincides with other studies that identified the need for a

collaborative ecosystem (Lippel, 2016). Academics like Lippel (2016) advocate for a strengthening of creativity and "free movement of people and services, in order to bring together communities of industrial players, researchers, and government" (p. 258). The co-creation of value, as prevalent in the digital economy, is believed to be first and foremost achievable by joining forces (Evens, 2010). The assessments that interviewees give about the willingness to cooperate differ remarkably, though. Interviewees discuss intragroup collaboration across the production flow, but also collaboration between different broadcasters. Niels Baas, for example, argues that broadcasters could benefit from quitting their local rivalry. When combining their digital services into one local platform, they could reach each other's target groups:

> "What you need to do as local broadcasters is to at least create one not-to-miss local subscription. Because in the long run, if you have this dominant position, everybody will profit from it, because everybody has this subscription… I always say to NPO, for instance, or to RTL: "This girl or boy, or man or woman, who wants to watch Temptation Island will not logically have a subscription to the NPO, because it's no their basic preference. If you combine it all together, then this person is at least within your reach." (Niels Bas, NLZIET, April 11, 2018)

Government bodies also recommend a centralization of efforts for the whole industry. However, public broadcasters are noticed to resists cooperation due to the firms' different main objectives. Especially opportunities of cooperation in terms of data insights are not yet recognized and none of them seems to be willing to do the first step:

> "Informally, I have a good relationship with RTL. But it's not that we really share. No, they don't do it with us and we don't do that with them." (Nicole Engels, NPO, March 21, 2018)

Niels Baas, the Managing Director of NLZIET, the SVOD platform of RTL, NPO, and Talpa, confirms that data sharing is not common yet between the broadcasters. This, however, takes away the chance to "see any customer journeys across different content, which is really important from a big data perspective" (Niels Baas, NLZIET, April 11, 2018). Even though no rules or regulations hinder a cooperation between commercial and public broadcasters on this level, there remains an unwillingness to move such initiatives forward:

> "It will be the best fight against the international competition, but in the short term they want to see how things will run and they say that they embrace it, but they do not. They give their content and a little bit of money. But really embracing the brand? I don't think they are going to do that." (Niels Baas, NLZIET, April 11, 2018)

Thereby, the case of NLZIET serves as a good example of the overall problem of the industry: While innovating, broadcasters automatically cannibalize their existing business models. Therefore, they see possible co-initiatives as a threat.

The topic of cooperation, therefore, serves as another example of the current paradox that dominates the Dutch broadcasting industry. Their efforts to innovate are reactions to an insecure, highly competitive environment and showcase the isomorphism of traditional players instead of entrepreneurial actions. Before the willingness to cooperate will become stronger, interview partners believe that the pressure for traditional companies needs to be intensified. Until now, the urgency is not perceived high enough for the broadcasters to embrace the new possibilities. Daniel Hendrikse reasons that maybe, they "have to go under and then they start realizing that they need to do something" (Daniel Hendrikse, FremantleMedia, April 20, 2018). The question remains whether they still have the chance to recover once they have drowned.

5. Conclusion

This work has researched the Dutch broadcasting industry's application of big data. Even though the topic of this research is much discussed in combination with the practices of SVOD platforms like Netflix, not much research has been conducted on the current possibilities of big data for decision-making about content prior to this study. Additionally, not much had been known about the perception of this topic in the broadcasting industry as a whole. Furthermore, there existed a lack of knowledge until now about how big data change organizational processes within media companies and production processes of creative products. Therefore, the focus of this research was put on data-driven decisions about content, leading to the research question "*How do companies in the Dutch TV broadcasting industry use data and what are their intentions regarding its possible application for content?*". To add to the body of literature, interviews with media professionals and a latent thematic analysis were conducted. Even though the findings cannot be generalized to other countries, the rich sample enabled the research to take the different perspectives existing in the Dutch broadcasting market into account and draw a detailed picture of current developments.

5.1. Embryonic state of data-driven content

The current developments within the Dutch broadcasting industry, as described and analyzed in this work, evoke the comparison with a journey whose outcome is still uncertain. It's the journey into the new Promised Land – the land of technology, where consumers are the center of attention, whose needs and wishes can and need to be anticipated at all times, and where individualism is king. In far distance lies the goal, to manage the digital transformation without becoming a victim of disruptive powers, and part of the journey has already been undertaken. While some traveling companions dropped out during the past phases, others already reached the shore. The first ones to step on new land, the tech companies, settled quickly, developed an infrastructure, a set of rules, and new standards that the latecomers have no choice but to accept. Those latecomers, namely traditional media companies, are now entering the part of the journey that takes them from the Old World to the other: the ocean crossing, the change of DNA that is required to develop a media company into a tech company. The crew has already embarked the ship, but will the other side of the water be reached?

As this research revealed, the Dutch broadcasting industry has not yet changed its core business. Big data's possible benefits for the industry are acknowledged, but not used exhaustively. Data are narrated as gold, the new currency, and data tools serve as a "gold mine for understanding customers' needs and identifying new business opportunities" (Chen,

Chiang & Storey, 2012, p. 1167). While dataism is widely spread the industry (van Dijck, 2014), the institutional nature of the traditional players requires "accord with norms and practices that have been widely accepted across the field" and therefore leads to efforts that are "fleeting, skin deep, merely ceremonial" (Lowrey, 2011, p. 67) and not truly transformational. A strong indicator for this is that content, the core of the industry, is rarely touched upon by data insights even though business models, distribution strategies, and user touchpoints have been identified and created that circulate around big data.

The research identified three main fields of application of big data for content: topic detection, production, and distribution. Using big data insights to decide which story to tell is the most widespread practice – because it is a rather easy to establish and not very intrusive process. With numerous commercial and open-source tools being available and platforms such as social media services offering analytics for companies (Lee, 2018), external data can be turned into insights and used as a source of inspiration. Internal data, such as clicks and viewing time of digital channels are deployed as metrics to decide which content to commission or to license. It can, however, be criticized that the media professionals of this study showed to be rarely aware of the fact that "online actions…are complex social interactions with varying meanings, logics and implications" (Tufekci, 2014, p. 505) and they therefore risk to arrive at wrong conclusions.

While data are used to match user tastes with content, they are not commonly used to "make creative decisions about *how* [emphasis added] to produce content" (Smith & Telang, 2018, p. 3). Theoretically, big data insights can be used to test multiple story lines for several metrics or tweak existing story lines to become more appealing for audiences. In practice, however, this is rarely done within the Dutch broadcasting industry. While many express the believe of big data benefiting content production by creating a feedback loop, there only exist a few projects where this believe is actually acted upon. One of the few exceptions of the norm are newsrooms, where the length or the headlines of articles are already tested in real-time. Here, feedback seems to be appreciated because the effect can be tracked and becomes apparent almost immediately. One reason for this is the different time frame for content production of newsrooms and linear or digital video content. Another is journalism – and articles – being perceived as "craftsmanship" whereas video production being perceived as more creative. Creativity is believed to be the core of the broadcasting business and while some see the possibility to pair creativity with big data to enhance the outcome, it is nevertheless insisted that big data only create value when combined with expertise and gut feeling. Overall, the importance of the 'human' factor for content is stressed and the "fear that entertainment will increasingly be shaped by analysts crunching numbers rather than creatives following their artistic vision" (Smith & Telang, 2018, p. 3) seems unjustified when looking at the current stage of the Dutch broadcasting industry. The high

degree of movement in the industry, however, shows possibilities for a more exhaustive shift into data-driven content in the coming years.

Last but not least, big data are used for content discovery with the help of recommender systems. The high popularity of this third field of application derives from the new consumer-centric orientation of the industry. Interview partners share the view that a personalized environment of their digital products enhances the customer experiences and leads to a better relationship between them and consumers (Smith & Telang, 2018). As recommendation systems become institutionalized throughout various online industries, the current struggles of the public broadcasters to withstand isomorphic tendencies surface the risks of this trend. As shown by this research, difficulties exist to translate public value into the commercialized practices of recommendation systems. It should not be forgotten, however, that the commercial model of recommendation systems that private broadcasters employ right now might also not suffice. While others see recommendation systems as a chance for unique content "because they can deliver that content directly to the best audience" (Smith & Telang, 2018, p. 3), it can also be argued that as long as recommendation algorithms surface content based on past behavior, the element of surprise will soon be observed to be missing.

5.2. Political and cultural dimension of data-driven content

Academics especially criticize recommendation systems for "remov[ing] people from collective experiences" (Couldry & Turow, 2014, p. 1712). They point out the missing "reliable and regular exchange of common ideas, facts, and reference points about matters of common concern" (Couldry & Turow,2014, p. 1722) within personalized environments and argue that these are crucial aspects of a democracy that will be pushed into the background by information that is closest to the individual's own interests and views (Couldry & Turow, 2014). With recommendation algorithms taking away the chance for users to be confronted with pluralistic opinions in their media consumption, the uncritical application of these practices within the Dutch broadcasting industry clearly has a political dimension.

Couldry and Turow (2014) describe this dominance of algorithm-mediated media consumption as a "momentum of cultural change" (p. 1718) and the point that data are rather culture than science (Tsuchiya, 2014) is also proven by other findings of this study. In their attempt to meet audience expectations and compete with technology enterprises, Dutch players are observed to include more and more algorithms in their daily practices. Therefore, it can be argued that cultural authority is shifted to individuals working in the field of engineering and technology (Hallinan & Striphas, 2016). This proves problematic when "issues of quality or hierarchy get transposed into matters of fit" (Hallinan & Striphas, 2016, p. 122), as was shown by this study in relation to the public broadcaster's struggle with

recommendation algorithms. The transformation of their public task into the digital sphere also implies a revisit of the definition of public value and the responsibilities that they carry. While they recognize the need to react to changing user behavior, they struggle to find their space in a digital world that is dominated by commercial solutions. Their low degree of application of big data for content can on the one hand be explained by their entitlement to educate and inform the public – something that cannot be achieved by blindly following consumer demand. On the other hand, it shows that they are critical about the use of big data insights for the quality of their programs. But other players argue that public broadcasters are holding on to traditional norms too much. To stimulate change, the idea of creating commercial competitiveness for public broadcasters was proposed by a few interview partners. Therefore, it seems like the question of the intended role of public broadcasters in this new ecosystem becomes crucial to be examined by the whole industry (Bardoel & d'Haenens, 2008).

In the end, the communicated ambitions of media professionals to analyze their content more thoroughly with the help of algorithms indicate that data will soon shape content production to a higher degree than it is the case now. In the process of separation from new players, the players of the Dutch broadcasting industry focus on the core of their business, that is, content. With the multiplication of distribution channels, content is experiencing its golden ages and creativity its sidereal hour. The combination of big data insights and content processes can therefore be expected to change the core of the broadcasting industry. The need for content to be analyzed will sooner or later "[blow] cultural goods up into millions of data points" (Morris, 2015, p. 448). This will eventually lead to a change in how content is handled and assessed because computers require reality to be presented as a "grid of numbers" (Berry, 2011, p. 2) with the help of subtractive methods. Be it books in the case of Amazon, songs in the case of Spotify or videos in the case of YouTube and Netflix: Audience tastes are nowadays monitored and controlled by algorithms that operate with logics that highly depend on the cultural, corporate and technical background of their creators (Morris, 2015). With its isomorphic tendency, the Dutch broadcasting industry risks to adapt to new norms uncritically instead of taking up its responsibility for the digital mediation of cultural commodities.

5.3. Embedding big data efforts in an overall strategy

The prevalent isomorphism explains the existence of data silos, the rather embryonic stage of data-driven content and the observed managerial struggles as well as low degree of willingness to change of the whole broadcasting sphere. It prevents traditional players from creating strategies that incorporate their core competences and allow them to separate themselves and their services from the tech companies they compete with. And while tech

companies nowadays disrupt several industries and gain the necessary specific expertise while doing so, media companies are far more challenged to transform into tech companies. If they do not speed up their transformational process and start to execute the needed changes, they risk losing their expertise to their greatest competitors. The demanded change of company DNA therefore signifies a rigorous reconfiguration of their core business. Because of that, "it is more important than ever that businesses have confidence that they understand what they want from big data" (Lippel, 2016, p. 258) instead of solely following industry trends. Since "big data is linked to the context of organizational intelligence and strategy" (Ducange, Pecori & Mezzina, 2018, p. 45), aspects that have proven important by this study are non-technical factors like mindsets of employees and managers as well as regulations that help create a level playing field between international and local players.

To return to the comparison of the journey to the Promised Land: With unaligned data efforts as present today in the Dutch broadcasting industry, companies risk to drift off course. The only possibility to reach the shore is by developing a strategy that follows a vision and does not only respond to short-term pressures and trends. As long as managers think in short-term solutions and exploit outdated infrastructure instead of focusing on new technologies, they will struggle (Wessel, 2016, p. 3). The role of management, the captain of the ship, is of uttermost importance here: Without a clear vision that leads the way, the ship will sink. And while others express the view that change will only come "if economic realities push through" (Lowrey, 2011, p. 75), this study believes that "a culture that encourages and rewards data-driven decision-making, collaboration, and entrepreneurship" (Batten Briefings (2016, p. 11) is the key factors of survival for the traditional broadcasting players.

5.4. Limitations

Even though this study delivered valuable answers to the main research question and its complimenting sub-questions, there are general and specific limitations to this research that need to be pointed out. First of all, even though recommended methods of research were followed and data was analyzed carefully, the full objectivity of the study cannot be guaranteed due to the subjective interpretations of the data by the researcher.

Secondly, professionals from the different broadcasters, namely RTL, Talpa, and NPO, were not interviewed in equal numbers. This is also the case for the associated production firms. The imbalance is especially strong between the two commercial broadcasters: While four interviews were conducted with professionals working for RTL and FremantleMedia, only one interview was conducted with a Talpa employee. Additionally, this interview only took 15 minutes and did not offer the possibility to obtain information about the content production company that belongs to Talpa. Furthermore, only one interview was

conducted with a public broadcaster that produces content for NPO, leading to the fact that only one point of view could be taken into account for the analysis in regards to data-driven content within public broadcasters.

Thirdly, the results of this paper suggest that the industry is slowly adapting in a market that can be characterized as highly competitive. Taking the many developments into account that happened during the duration of this research, it can be anticipated that the speed of change will increase and that not all developments could be covered by the analysis. With new data strategies being developed, new products being created and new initiatives being communicated week after week, the industry seems likely to be picking up speed and changing more thoroughly during the next year. For this paper, this also implies that not all practices and future intentions of the application of big data or competitive strategies might have been shared openly by the interviewees. One interviewee, for example, stated to not have information about possible cooperation plans due to his limited field of knowledge. During the course of the research, it was found out by the researcher that the company has already been working on such cooperation plans since a few months but that this information is handled confidentially due to the high competitiveness of the market.

5.5. Future research

Since digital technologies internationalize media industries, further research could go beyond national borders (Moe & Syvertsen, 2007) and "map out the changing balance of power" (Galperin, 2004, p. 166) on a global scope. Academia could possibly compare the degrees of application of big data for the broadcasting industry in certain countries and look into the factors that facilitate or hamper this. Following this, Mager (2012) points out the need to research the relation between US-American tech companies and the cultural value systems of European countries. While it can be assumed that cultural value systems between European countries differ, it can also be assumed that the degree of application of big data to decision-making about content differs between countries.

Adding on to the main findings of this work, further research could also look into the perceived identity of broadcasting companies. Since the results of the analysis showed that those companies stress their expertise in content production and the importance of creative freedom in this regard, but also advocate for a change of DNA to become more technology savvy, research could be conducted about how the expertise of tech companies that operate in the creative industries is perceived and what is done by traditional media companies to differentiate themselves from the international players while adapting to new standards. Additionally, academics could offer recommendations for broadcasting companies on how to develop a strong data strategy that fulfills the demands of the fast-changing industry.

Since the research furthermore revealed the importance of cooperation between local players to counter the dominance of monopolists, the field of possible cooperation between local players should be explored. In this regard, specific focus could be put on the role of public broadcasters and their legal possibilities to engage in a cooperation with commercial business model. Additionally, more should be researched about the different business objectives of public and private broadcasters and if and how these business objectives could be merged into one business model. This also entails a possibility to research the role of state actors in this transformational processes, their decision-making power and the connections between policies and societal opinions and demands (Galperin, 2004). Last but not least, more research is needed on how big data affect the cultural practices surrounding content within the broadcasting industry. This includes research about possible ways for public broadcasters to ensure a translation of public values into algorithms.

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Appendix

Appendix A.1: Regular Interview Topic List

This topic list exemplifies the questions that have been asked during most interviews. However, not all questions have been asked during all interviews and some questions that might have been asked – depending on the course of the interview – might not be included in this list.

Topic 1: How big data create market changes and changes of daily practices

1. Please explain briefly what role you hold within your company.
1.1.　If applicable: What role do big data play for your daily work?
2. During the past years, the ways in which data can be used to add value to existing processes changed. How do you perceive how the Dutch TV broadcasting market changed because of that?
3. What, in your eyes are the most important developments of the Dutch broadcasting market? Why?
3.1.　If not answered: On which current developments would you personally like to focus on? Why?
4. What opportunities rise through big data, in your opinion? What are the benefits of using big data more?
5. What negative effects do big data bring along, in your opinion?

Topic 2: Big data and their effect on decision-making and content production

6. From which channels are data currently collected? (internally and externally)
7. What conclusions are drawn from the analysis of these data?
8. What does your unit/firm use big data for?
8.1.　Probe: New products, new business models, new (advertising) strategies, new or different content
9. How do you perceive the importance of big data for the creation of content?
10. Which strategies exist to implement big data into the creation of new products or services in your company/in the industry?
11. To your best knowledge, how does big data affect the creation of content at the moment?
11.1.　Probe: Can you give an example?
11.2.　If big data are not used much for content creation yet: What do you think is the right way for your company to collect big data for creation processes of creative products?

11.3. Probe (if not yet answered): From which channels would this data be collected? (internally and externally)

11.4. Probe: How would this data be analyzed?

12. In your eyes, how could big data further help content creation?

13. Which obstacles does your unit/company/industry face regarding the procurement and implementation of big data for the creation of content?

14. What role does the experience of professionals and their expertise play for the production of content in your company?

15. Do you feel that there is a shift of power between expertise and big data for decisions about content?

15.1. Probe: For example, how are decisions concerning content made in your company?

Topic 3: Big data's possibilities and ways forward

16. What kind of differences are you aware of that exist between traditional linear TV and online products (e.g. streaming services or websites) in regard to the integration of big data analytics?

17. How is your company/the local market staying competitive? What does your company/the industry do in order to stay competitive?

Appendix A.2: Specific Interview Topic List

In some cases, specific topic lists have been developed for specific interviews. This was, for example, the case for the interview with the policy maker from the Ministry of Education, Culture and Science. The questions that were prepared before the interview can be found below.

Topic 1: Factors for market changes

1. Please explain briefly what role you hold within the Ministry.
2. How do you perceive how the Dutch TV broadcasting market changes?
2.1.　If not answered: What are the reasons for these changes?
3. How do you assess the role of the specific characteristics of the Dutch broadcasting system for recent changes in the market?

Topic 2: The role of the Dutch government

4. How would you describe the role of the government in today's Dutch media landscape?
4.1.　If not answered: What are the government's responsibilities for the Dutch broadcasting industry?
5. How do you assess the role of the specific characteristics of the Dutch broadcasting system for recent changes in the market?
6. Please tell me more about the data laws that are currently in place and how they relate to the competitive landscape of the industry.
7. Are there any other laws that affect market competitiveness?
8. How do you think that the requirements for public broadcasters affect their competitiveness?
8.1.　How do they affect their willingness to change and their innovative mindset?

Topic 3: Possibilities and ways forward

9. What kind of differences are you aware of that exist between traditional linear TV and online products (e.g. streaming services or websites)?
10. How do you think the public service mandate can be translated into algorithms (for example, of recommendation engines)?
11. How is the local market staying competitive? What does the industry do in order to stay competitive?
11.1.　What are differences between public and commercial broadcasters in this regard?
11.2.　What needs are difficulties are communicated by public and commercial broadcasters?

12. What would in your eyes be an adequate reply to market changes from a) the single players and b) the government?
13. What is your opinion about cooperation between different players?

Appendix B: List of Interviewees

Interview #	Name of interviewee	Job title	Company	Date of interview	Approx. length of interview	Comments
1	Kasimir Landheer	Data and Strategy Director	FremantleMedia	06.03.2018	50 mins	
2	Just Vervaart	Manager of Business Intelligence	NPO	08.03.2018	50 mins	Left NPO in May 2018; established contact to Nicole Engels
3	Tom van den Broek	Head of Product	NOS	09.03.2018	45 mins	Established contact to Gerard de Kloet
4	Maurits van der Goes	Data Engineer and Data Scientist	RTL	13.03.2018	50 mins	Established contact to Hajo Wielinga
5	Erik van Hoeswijk	CEO	Cleverlions	13.03.2018	60 mins	Established contact to Nicolette Nol
6	Nicole Engels	Head of Public Research and Marketing Intelligence	NPO	21.03.2018	40 mins	Established contact to Niels Baas
7	Hajo Wielinga	Data Analyst	RTL	21.03.2018	40 mins	
8	Hans Bouwknegt	Advisor Digital Strategy	Dasym	22.03.2018	45 mins	Former employee of Talpa; recording device stopped recording after 6 minutes
9	Gerard de Kloet	Head of Digital	NOS	04.04.2018	45 mins	
10	Niels Baas	Managing Director	NLZIET	11.04.2018	80 mins	Established contact to Dorine van Mullem and Brams Voermans
11	Daniel Hendrikse	Content Director	FremantleMedia	20.04.2018	80 mins	
12	Tim Zunneberg	Head of Marketing & Communication and Digital	Omroep Brabant	24.04.2018	30 mins	Approached on LinkedIn; interview took place during conference
13	Dorine van Mullem	Director Business Intelligence and Strategy	Talpa TV	03.05.2018	15 mins	Interview time was stopped prematurely due to a change in

						schedule, follow-up call was declined
14	Bram Voermans	Senior Policy Officer	Ministry of Education, Culture and Science / Directorate Media and Creative Industries	04.05.2018	50 mins	Requirement for participation: no direct quotes and not general statements about the government
15	Leon Backbier	Manager ICT	Endemol Shine	08.05.2018	30 mins	Interview took place during conference
16	Nicolette Nol	Concept Developer / Creative Producer	KRO-NCRV	17.05.2018	55 mins	

Appendix C: Coding example

Theme	Sub-theme	Connection to literature	Open codes (examples)
Current application of big data	Use of internal and external platforms		Unique needs vs. one-fits-all tool
			Customization of external tools
			Unwillingness for tradeoff for deficits of existing tools
	Big data as business analytics	Chen, H., Chiang, R. H. & Storey V. C. (2012); Lippel, H. (2016).; McAfee, A. & Brynjolfsson, E. (2012)	Translation of growth goals into numbers
			Measuring of business performance with big data
			Predictions of business performance
	Big data for content	Kelly, J. P. (2017); Smith, M. D. & Telang, R. (2018); Lowrey, W. (2011)	Enhance user experience/increase relevance
			No combination of linear and digital products
			Untapped opportunity
	Differences between content characteristics		Difficulty to implement insights for video
			Articles: differentiation between right and wrong
			Different levels of complexity
	Mathematical sublime in practice	Mager, A. (2012)	Recommendations not questioned
			Incomprehensibility of big data makes it scary
			Rise of curiosity with higher analytical expertise
	Reaction: narrating creativity		Automization tools lack element of surprise

			Combination of data and gut feeling
			Job of creatives: create feelings/emotions
	Big data for topic detection	Lee, I. (2018)	Predition of trends
			Gaining audience insights from external sources
			Segmentation of users into by interests and behavior
	Big data for production	Hallinan, B. & Striphas, T. (2016)	Possibility of improvement of story line
			Feedback loop
			Making video searchable
	Big data for distribution and discovery	Couldry, N. & Turow, J. (2014).; Morris, J. W. (2015)	Perceived high usefulness of data for personalization
			Focus on recommendation engines
			Respecting new standards