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Safeguarding the Journalistic DNA: Attitudes towards the Role of Professional Values in Algorithmic News Recommender Designs

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ABSTRACT

In contrast to the extensive debate on the influence of algorithmic news recommenders (ANRs) on individual news diets, the interaction between such systems and journalistic norms and missions remain under-studied. The change in the relationship between journalists and the audience caused by the transition to personalized news delivery has profound consequences for the understanding of what journalism should be. To investigate how media practitioners perceive the impact of ANRs on their professional norms and media organizations' missions, and how these norms and missions can be integrated into ANR design, this article looks at two quality newspapers from the Netherlands and Switzerland. Using an interview-based approach conducted with practitioners in different departments (e.g. journalists, data scientists, and product managers), it explores how ANRs interact with organization-centred and audience-centred journalistic values. The paper's findings indicate a varying degree of prominence for specific values between individual practitioners in the context of their perception of ANRs. At the same time, the paper also reveals that some organization-centred (e.g. transparency) and most audience-centred (e.g. usability) values are viewed as prerequisites for successful ANR design by practitioners with different professional backgrounds.

Introduction

The introduction of digital technologies has led to drastic changes in the field of journalism. One example of such a change is the deployment of algorithmic news recommenders (ANRs) that affect online news consumption habits (Moeller et al. 2020; Makhortykh et al. 2020) by transforming news delivery by offering users personalized news selection (Moeller et al. 2018; Bastian et al. 2020). Combining AI-driven techniques with data about content (e.g. topic) and audience features (e.g. user's age), ANRs learn users' news preferences to predict what content might be interesting for them

(Karimi, Jannach, and Jugovac 2018) or even to help them achieve their epistemic goals (Sullivan et al. 2019).

The substantial impact of personalized news delivery on the news industry (Newman 2018) is the result of increasing integration of AI, algorithms, and automation into media organizations' working routines. This shift in journalistic practices and the relationship between the journalists and the audience causes a need for profound reassessment of the role of journalistic values,[1] namely principles and norms guiding public journalism (Ward 2018). In the light of the societal responsibility of the news media, responsibility for upholding journalistic values must also extend to the use of ANRs, which can be seen as an extension of the editorial function of a news outlet (Lu, Dumitrache, and Graus 2020). With the shifting of parts of editorial activity to algorithms, the relationship between ANRs and journalists' norms is far from being a one-directional one: on the one hand, professional ANR design is important in preserving the societal function of journalism, but on the other the integration of ANRs requires revisiting professional norms and concepts, as well as reconsidering what exactly that societal function of journalism is (Diakopoulos 2019b; Bodó 2019).

To advance understanding of the interactions between ANRs and journalistic values, this article scrutinizes how different groups of practitioners in traditional media organizations[2] (e.g. journalists, data scientists, and product managers) perceive personalized news delivery and what values they see as essential for the design of ANRs. Specifically, it looks at two groups of journalistic values – organization-centred and audience-centred ones – and discusses their perception by practitioners in the context of personalized news delivery and possible ways of integrating these values into ANRs.

To achieve this goal, the paper uses in-depth-interviews conducted at two quality newspapers, *Het Financieele Dagblad* (FD, the Netherlands) and *Neue Zürcher Zeitung* (NZZ, Switzerland), as both outlets were undergoing the process of designing or redesigning their ANRs. By contrasting organizations that operate in different media systems and practitioners with different professional backgrounds, the paper aims to identify factors important for more "value-sensitive" (Friedman, Kahn, and Borning 2008) ANR design in the news domain.

News Distribution through ANRs

The deployment of AI-driven systems in the field of journalism has a substantial and often varying impact on media organizations (Bodó 2018). The way the integration of ANRs affects the realization of journalistic values remains under-studied, however, despite a growing recognition of the differences in the adoption of such systems between countries and individual organizations (e.g. Van Den Bulck and Moe 2018; Bodó 2018, 2019; Diakopoulos 2019a). Consequently, there is still a shortage of comparative studies looking specifically at the relationship between journalistic values and the deployment of AI-driven innovations, in particular for news distribution, compared to the larger body of research looking at personalized content delivery in the context of news aggregators (Nechushtai and Lewis 2019; Bandy and Diakopoulos 2020), search engines (Unkel & Haim, 2019; Trielli and Diakopoulos 2019), or social media platforms (Schmidt et al. 2019).

Similar to the use of AI for content production (Diakopoulos 2019a; Lewis, Guzman, and Schmidt 2019), the deployment of ANRs[3] that expose readers to "the hidden richness and diversity of content" (Bodó 2018, p. 14) raises questions related to journalistic ethics. In particular, these questions concern the effects of technology on journalistic responsibility and agency (Carlson 2018) and normative aspects of the changing relationship between journalists and their audience (e.g. whether the collection of user data by journalistic organizations in order to provide personalized news suggestions can undermine user privacy). The debate on the use of ANRs for news distribution also relates to the broader discussion of the societal functions of the media, such as informing the society about important developments, and whether these can be amplified or undermined by AI-driven systems (Helberger, 2011, 2019).

The importance of integrating journalistic values into mechanisms of individualized news delivery is reflected in the mixed assessments of ANRs' effects on newsroom routines. While ANRs are viewed as powerful tools for engaging the audience (Newman 2018) and augmenting human decision-making (Bucher 2017), their deployment is also considered a potential disruption of journalistic practices. By not taking into consideration journalistic values, ANRs can undermine journalists' (Carlson 2015) and readers' autonomy (Harambam et al., 2019) and limit editorial independence by facilitating manipulations in the media sphere (Bastian, Makhortykh, and Dobber 2019; Helberger, 2019; Makhortykh and Bastian 2020). A frequent lack of transparency concerning ANR design (Diakopoulos and Koliska 2017) further amplifies these worries and leads to the prevalence of negative perceptions of ANRs, such as concerns relating to their role in creating the notorious "filter bubbles" (Bruns, 2019).

The seriousness of these concerns stresses the importance of better understanding the process of value-sensitive design in the news sector. Value by design has been defined as "a theoretically grounded approach to the design of technology that accounts for human values in a principled and comprehensive manner throughout the design process" (Friedman, Hendry, & Borning, 2008, p. 1). Value-by-design approaches acknowledge that algorithms are not neutral; instead, the way they function is the result of a range of decisions made by those deciding to implement them (Gillespie 2014). In order to be able to align recommendation algorithms with journalistic values, it is therefore critical to understand what the systems are optimized for (Stray, Adler, and Hadfield-Menell 2020), as well as how and by whom those decisions are made. While much of the existing work on value-sensitive design has concentrated on the recommendation algorithm alone, there is a growing realization that algorithms cannot be viewed as design objects in isolation, but that, in order to realize values in algorithms, it is necessary to look at the broader cultural and human context in which the algorithm is situated, at the stakeholders involved, and at how they conceptualize and negotiate values (Baum 2020). In the context of newsrooms, those stakeholders are not only editors and journalists but also data scientists, product owners, and user-experience researchers working on the concrete design and implementation of ANRs.

The implementation of safeguards to protect the "journalistic DNA" (i.e. the values that guide journalists' work) is therefore a task that is far from trivial because of the complexity of the technology itself and the way it functions in interaction with both its professional users and news consumers. The often-debated nature of journalistic

values further complicates their translation into algorithms. Decisions related to news distribution are also often influenced by practitioners' individual attitudes, thus making it hard to generalize those values and to translate them consistently into concrete design principles (Friedman, Hendry, and Borning 2017). The latter issue is complicated by the transformative effect of datafication (e.g. the use of audience metrics, see: Lee, Lewis, and Powers 2014; Tandoc and Ferrucci 2017) on the understanding of how journalism should work. Consequently, the process of embedding values into ANRs becomes a major challenge for media organizations, which can be addressed only through close collaboration between all those involved in the decision to implement, use, and design the technology.

Journalistic Values and ANRs

Values in the Journalistic Fields

A normative approach to journalism takes into consideration not only broader conceptualizations of media and journalistic ethics but also a specific set of values the practitioners should adhere to (Deuze and Witschge 2018). Such values can be related to different aspects of journalistic work – although overlap is also possible – such as the production process (e.g. autonomy; Sjøvaag 2013), the news content produced (e.g. objectivity; Schudson 2001), or the structure of the organization (e.g. accountability; Bertrand 2000). These values guide both the behaviour of individual practitioners (e.g. objectivity determining what to include or not to include in a news story) and media organizations (e.g. transparency requiring the organization to disclose how individual data about online readers is collected and processed, see: Van Drunen, Helberger, & Bastian 2019).

Because journalistic values are integral for the definition of what journalism should be, there is an extensive debate on how those values should be defined. This article follows the definition by Ward (2018), who identifies journalistic values as a set of principles and norms guiding public journalism. As a starting point for defining what values are to be included in this set, the paper uses the work of Deuze (2005), which proposes several key concepts (i.e. public service, objectivity, autonomy, immediacy, and ethics) that can be used for mapping journalistic norms. Additionally, the paper takes into consideration a number of studies dealing with individual journalistic values in the context of traditional media, such as diversity (Porto 2005), objectivity (Ward 2004), autonomy (Singer 2007), credibility (Hayes, Singer, and Ceppos 2007), and transparency (Ziomek 2005).

To organize the discussion of the relationship between journalistic values and ANRs, we differentiate between two categories of values: organization-centred and audience-centred ones. The former includes traditional journalistic values (e.g. objectivity and diversity) and is informed by the existing literature on the norms and practices that constitute "good" journalism within media organizations, as summarized by Deuze (2005). These values play a prominent role in newsrooms' working routines by defining journalistic practices and their products.

The second category incorporates values that focus on the relationship between the media and the audience (e.g. privacy and user agency) and is informed by

research on the adoption of digital innovations by media organizations, in particular personalized news delivery (e.g. Thurman et al. 2019; Bodó et al. 2019; Monzer et al. 2020). Unlike more inward-looking organization-centred values, which deal primarily with internal journalistic practices and their products, outward-looking audience-centred values concentrate on interactions between journalistic organizations and their audiences, in particular as these values undergo fundamental changes caused by evolving distribution practices (e.g. using ANRs). The integration of ANRs into journalistic routines moves audience-centred perspectives more to the fore, as the technology is typically implemented in such a way as to shape (or reshape) and manage the relationship with the audience, and to do so in a more fine-grained and personalized way (Guzman 2019).

Organization-Centered Values and Algorithmic News Distribution

The deployment of ANRs affects multiple organization-centred values, including those which are formative for practitioners' understanding of what good journalistic practices should be, and vice versa.

Objectivity is the value most commonly found at the core of the debate on the relationship between journalism and algorithms. Often viewed as a key occupational value in the field of journalism (Schudson 2001), objectivity is a highly contested concept that has attracted multiple interpretations down the years.[4] The concept of objectivity as a journalistic value is usually associated with reporting verifiable information in an impartial, truthful way, without mixing it with practitioners' personal feelings and attitudes. While the practical realization of objectivity can be complicated by multiple factors, varying from self-censorship (Lee and Chan 2009) to changing production practices (e.g. Aitamurto 2019), this value remains a cornerstone of journalistic credibility.

The adoption of ANRs has substantial influence on the perception and the practical implementation of the value of objectivity. Unlike the value of objectivity relying on institutional norms, algorithmic objectivity is often defined as a "mechanical neutrality" (Carlson 2019). Similar to the use of algorithms in other fields, ANRs are often associated with lesser bias compared with human editors and are thus viewed as more objective, although this perception is more common among the audience than professional practitioners (Thurman et al. 2019). Within newsrooms, by contrast, there is broader recognition of the limitations of algorithmic objectivity, which translates into calls to keep humans "in the loop" (Carlson 2018) and to retain options for manual intervention by editors (Bucher 2017).

Another value to experience a profound change following the "algorithmic" (Anderson 2013) turn in journalism is diversity. Like objectivity, diversity is a complex notion that is usually associated with the presence of a "multiplicity of voices" (Voakes et al. 1996, p. 568). The value of diversity can be applied to multiple aspects of media practitioners' work, varying from their choice of topics (Carpenter 2010) to political attitudes and cultural aspects (Van Cuilenburg 2000). These aspects can be broadly divided into two major forms of journalistic diversity: newsroom diversity (i.e. the presence of practitioners of different genders or races) and source diversity (i.e. the

visibility of different perspectives and opinions; Deuze 2005). In the context of ANRs, source – or content (Carpenter 2010) – diversity is of particular interest; in the current article we treat it as variety of topics and journalistic products delivered to readers via personalized channels.

In contrast to objectivity, in the case of diversity there is rather extensive debate on the possible effects of ANRs (see, for instance: Bruns 2019; Fletcher and Nielsen 2018; Moeller, Helberger, and Makhortykh 2019; Bodó, et al. 2019). At the same time, in contrast to the traditional newsroom debate that focuses on supply diversity, ANR-related discussions stress the importance of exposure diversity; i.e. the diversity of content users are exposed to (Napoli 1997). This is because ANRs and the way they are designed define which news items users get to see, or not see. Shifting the locus of debate from supply diversity to exposure diversity, however, also raises difficult questions about the composition of the information diet for which news media organizations wish to optimize their services and the effect of news exposure on the audience. The need in this context to reconsider the meaning and purpose of diversity in news is further amplified by the threat of political polarization, concerns about the formation of so-called algorithmic filter bubbles, and the lack of variation in personalized information selection (Zuiderveen Borgesius et al. 2016; Bruns 2019).

Two other values affected by the transition to personalized news delivery are transparency and accountability. Transparency is commonly viewed as the availability of information that allows monitoring of the performance of a specific actor or system (Diakopoulos 2020). In the case of ANRs, transparency can be treated as the ability to monitor and check the functionality of algorithmic systems involved in the news distribution. Keeping journalistic routines transparent is an important condition for the functioning of public journalism, but the adoption of digital innovations substantially complicates this task, in particular in the case of ANRs that function as "closed" boxes (Diakopoulos and Koliska 2017). The complexity of integrating transparency into ANR design is amplified by a broad range of system elements (e.g. data inputs or data-processing mechanisms) that can be made transparent, and varying requirements of the audience or non-technical practitioners in respect of algorithmic transparency.

While transparency by itself is not sufficient to enable (algorithmic) accountability in the news industry (Diakopoulos 2020), it is a basic prerequisite for it. Frequently related to the notion of responsibility (Plaisance 2000), accountability is another complex norm that deals with the need to address possible violations of professional norms defining what "good" journalism is (Fengler et al. 2014). In this article, we treat accountability as a commitment by journalistic organizations to account to society for their actions by engaging in dialogue with their audience about news production and distribution, including the use of ANRs (Chaparro-Domínguez, Suárez-Villegas, and Rodríguez-Martínez 2020). Despite the large number of established mechanisms for holding media organizations accountable (e.g. ombudsmen), their applicability to possible misdoings related to ANRs remains an open question. Consequently, the process of integrating accountability into ANR designs is still far from being realized, even though an increasing number of studies emphasize the importance of its implementation.

Audience-Centered Values and Algorithmic News Distribution

In contrast to organization-centred values, audience-centred ones (i.e. those explicitly concerning the audience and its needs) are currently less prominent in journalistic norms and standards. While some exceptions exist (e.g. transparency, which is recognized as an integral component of the journalistic ethos), the existing norms tend to focus on values related to traditional working routines associated with news production. However, the changing relationship between the media and the audience in the context of ANRs' deployment is also amplifying the role of other values that were less prominent before the "algorithmic" (Anderson 2013) turn in journalism.

Privacy is one of these audience-centred values, and is becoming increasingly important as news organizations turn to personalized news delivery. Defined as the ability of individuals and groups to determine when and how information about them is communicated by others (Westin 2003), privacy is a highly complex phenomenon that takes on different meanings in different contexts (Nissenbaum 2011). In the context of journalism, privacy was for a long time part of the debate on what aspects of individual life should be reported (Loosen 2011). However, the ongoing transformation of news organizations into data enterprises that utilize personal data about their audiences when deploying algorithmic systems such as ANRs is expanding this value to include the privacy of readers as well as that of news subjects (Eskens 2020).

Data protection is another audience-centred value related to privacy. Traditional interpretations of data protection in the journalistic context relate to the relationship between the public functions of journalism and the rights of individuals who are reported about (e.g. under what circumstances it is ethical or legal to publish personal data such as images of a person's home; Erdos 2016). However, the growing use of audience metrics in newsrooms and the deployment of ANRs relying on user data also make media organizations responsible for protecting the large volumes of data about individual readers (e.g. what exactly they read, but also where from and using what devices). In this context, we opt for a broad treatment of the value of data protection that emphasizes the importance of both protecting reader data and providing readers with control over how their data is used and processed, in particular for the purposes of automated decision-making as in the case of ANRs (Eskens 2019). Consequently, concerns about the data used by the ANR (and also data protection measures implemented by the organization) are an important factor in the user's decision to trust and appreciate individualized news delivery and also influences how the change in their relationship with the outlet is perceived (Monzer et. al, 2020).

Another audience-centred value related to privacy and data protection is user agency and autonomy. Intrinsically associated with the debate about the relationship between journalism and its audience, this value is related to attributing a more active role in news consumption (but also news production) to the audience, by contrast with a view that treats readers as passive recipients of information provided by journalists (Van Dijck 2009; Milioni, Vadratsikas, and Papa 2012). On the practical level, user agency usually deals with the broadening of users' engagement with content by giving them more possibilities to express their opinion about it, but also potentially includes enabling more options for selecting what news to read or even influencing its production by the outlet. The effects of ANR deployment on user agency remain

an open question; on the one hand, personalized news delivery based on individual preferences increases agency, but at the same time the limited ability of users to control ANRs can diminish it (Monzer et al. 2020). Furthermore, the relationship between freedom of expression and the right to receive information is also important in the context of ANR deployment (Balkin 2004; Eskens, Helberger, and Moeller 2017; Helberger, Karppinen, and D'Acunto 2018).

There are also other audience-related values relevant for the deployment of ANRs. Some of these feature most prominently in the discussion of journalistic values and value-centred design (e.g. user agency), whereas others (e.g. personal relevance and enjoyment of use) surface in research into the factors influencing user experiences of individualized news delivery systems (Monzer et al. 2020).

Research Questions

The brief overview we have provided of possible interactions between organization-centred and audience-centred journalistic values and ANRs highlights the complexity of integrating these values into ongoing processes for the adoption of technological innovations in newsrooms. The deployment of new technical systems and the growing influence of new roles (e.g. data scientists and user-experience designers) impact how media practitioners perceive both individual professional norms and their organizations' missions. To investigate how these changing perceptions are influenced by the deployment of ANRs and in what ways specific journalistic values can be translated into ANR design, we pose the following research questions.

> RQ1. How do media practitioners with different professional backgrounds perceive the role of journalistic values in the process of designing and deploying ANRs, in contrast to other journalistic contexts?

> RQ2. What is the perceived relationship between organization-centered and audience-centered values in the context of individualized news delivery, and how can this influence the design of ANRs?

> RQ3. Are there differences in how media practitioners with different professional backgrounds perceive the importance of specific values for the design of ANRs?

Methodology

To answer these questions, this article relies on semi-structured interviews with 17 media practitioners from two quality newspapers in the Netherlands and Switzerland: *Het Financieele Dagblad* (FD) and *Neue Zürcher Zeitung (*NZZ). FD is a daily financial newspaper with a nationwide circulation, based in Amsterdam. Its print edition has an average circulation of 36,000 (FD 2018) and its total number of subscriptions is around 98,000, with a continuous increase in digital subscriptions (FD 2019). Unlike FD, which focuses on financial news, NZZ has a broader focus and a long tradition of quality news reporting for German-speaking Switzerland. It is a daily newspaper based in Zurich and has an average circulation of around 71,000 printed copies. Like FD, NZZ also has quite a substantial online readership, which in 2020 reached more than 240,000 readers (NZZ 2020).

As our interviews were being conducted, both outlets were undergoing a process of designing or redesigning their ANRs. NZZ was further advanced in this than FD. Whereas NZZ already had its personalized news stream in place (see, for instance: Pfitzner 2017; Barmettler 2018), but was continuously adapting it, the interviews at FD took place at a time when in-depth planning of the actual ANR design was in a more initial phase. Consequently, while some simple user-driven personalization solutions were already in place at FD (Bastian et al. 2020), its system-driven solution in the form of an ANR was still far from complete.

The interviews focussed on practitioners' perceptions of the relationship between journalistic values and ANRs, and also possibilities for implementing a mission-sensitive approach to personalized news distribution. In a first step, the selection of interviewees was based on their involvement with the development and use of ANRs (both directly and indirectly), and included data scientists (three interviews), product managers and owners (five), and user-experience researchers (two).

During the course of the study, the possibility of additionally interviewing seven journalists at one of the newspapers (FD) was offered to the research team. Although it was not initially planned, the authors decided to make use of this opportunity. The same set of questions was used to conduct these additional interviews. While this addition to a certain degree affected the comparability of the two cases (i.e. no journalists from NZZ were interviewed), it also allowed us to better understand the journalists' perspective of news personalization and to compare that with the perspectives of more IT-oriented practitioners directly responsible for the development of ANRs.

At FD and NZZ alike, the sample of interviewees included both male and female subjects with both local and migrant backgrounds, as well as employees at the beginning of their career and others in its final stages. At NZZ there were more practitioners in the early stages of their career (as contrasted by a more balanced composition of FD interviewees), and in both cases there was a higher proportion of males than females, reflecting the general composition of the teams working with ANRs at the two newspapers.

The interviews followed a pre-prepared guide with open-ended questions, and included stimulus material in the form of 34 cards. Each of these had a different value (either organization-centred or audience-centred) printed on it.[5] The use of cards served three objectives. First, after identifying those values which first came to interviewees' minds through open-ended questions, the cards allowed us to explore the role of values that had not been mentioned. Second, several values are closely related yet still differentiated in the scholarly debate (e.g. objectivity and neutrality; Boudana 2011), so the presentation of overlapping but non-congruous concepts via cards allowed us to capture nuances in interviewees' attitudes towards the relationship between values and ANRs. Third, this approach prevented the authors from asking the same questions about each of the 34 values (for a similar research design, see, for instance: Bastian 2019).

The guide consisted of three parts: (1) general questions about the interviewee's background; (2) questions about their interactions with ANRs; and (3) questions about their attitudes towards ANRs and their design. The first and second parts were important to understand how interviewees' own experiences can influence their answers. In

the third part, the relationship between ANR design and journalistic values was explicitly discussed. As part of this discussion, the interviewer first asked open-ended questions concerning those values which should be integrated into ANR design and whether they had been part of actual discussions of ANR design and deployment within the organization. Then, inspired by the think-aloud method (for the use of this in a journalistic context, see: e.g. Malik 2004), the interviewees were handed over the stimulus material and asked to pick the items they view as most important for ANR design – first a set of cards with organization-centred (or: traditional journalistic) values, then second set with audience-centred values. This facilitated the discussion and allowed the interviewees to elaborate on why specific values should be taken into account, as well as revealing how the two groups of values relate to one another from their perspective.

The interviews took place in 2018 and 2019 and were conducted by one of the authors in person at the respective newsrooms, in the interviewee's mother tongue.[6] They lasted between 25 and 70 min and were analysed using the software Atlas.ti, which is commonly used for qualitative content analysis. A combination of deductive and inductive approaches was used to detect content categories related to journalistic values. The initial set of categories was derived from existing research on journalistic values (see section on journalistic values and ANRs), which also informed the interview guide and the selection of values for the cards. Then, during the course of the coding process, the set of categories was expanded and reordered according to the observations coming from the data. The final list of categories used to structure the findings below is made up of two groups of values: organization-centred and audience-centred. The former include objectivity, public service, autonomy, immediacy/depth, accountability/transparency, trust, and diversity/inclusiveness/cultural plurality/social cohesion, the latter privacy/data protection, broad information offer/personal relevance, usability/enjoyment of usage/surprise, and user agency.

Findings

Perceptions of Organization-Centered Values in the Context of ANRs

Objectivity

In line with existing research (Carlson 2018; 2019), the value of objectivity turns out to be a central yet debateable concept in the context of ANR deployment. Its interpretations share similarities with related values; in particular neutrality, which is frequently interpreted in the same vein as objectivity. In both cases, objectivity and neutrality, one major disagreement between interviewees (regardless of their professional background) was how these two values should be implemented. Their opinions varied from a classical approach, meaning that neutrality and objectivity are the sole responsibility of journalists working on news stories, to calls to implement them as part of ANR design and for their use as overarching principles for the functioning of the media organization.

At the same time, interviewees doubted the possibility of consistently realizing the two values in a way that also aligns with existing research on the perceptions of objectivity and neutrality in the newsroom (e.g. Boudana 2011). For instance, one

journalist noted that objectivity "is almost impossible to achieve in practice … You are someone who has certain convictions … even if you try to disentangle yourself from these." Another practitioner from the user-experience research department suggested that acknowledging the presence of individual perspectives in news coverage is not necessarily damaging for journalistic output, but makes it more transparent. In this context, the use of ANRs is viewed as a means of realizing objectivity by recommending stories from different sections (e.g. economy or culture) or different opinion pieces, as well as suggesting articles from different outlets owned by the same media house.

The difficulties in finding a common understanding of objectivity are also reflected in practitioners' suggestions to use other values to capture its basic meaning. Journalists in particular argued for the use of fairness as a proxy for objectivity in the context of ANR design, as shown by the following quote: "Fairness [is] maybe the best term that can capture a bit better the quest for objectivity. That is, you try to act as honestly as possible and to treat everyone in a fair way." Interviewees noted that fairness encapsulates the balance between the consequences of publishing news stories for individuals and groups mentioned in them with the public interest. Hence, it is essential to integrate fairness into ANRs because "something that is harmful for one person, other people might find very interesting to read, but maybe it is not fair to put this at the top of the newsletter or your personalized website."

Another objectivity-related value, impartiality, was also related by practitioners to the audience-centred values of privacy and data protection, in a manner similar to fairness. Specifically, practitioners mentioned impartiality in the context of the need to "protect" people about whom they are reporting and used as an example the scenario in which algorithmic objectivity might conflict with more humane interpretations of that value:

> "Maybe an algorithm is more impartial regarding what is put first in a recommendation environment, whereas we might perhaps think, 'We should place less emphasis here, because this could be harmful for someone.' … So the question is, who is more impartial?"

The concrete example being referred to here is reporting about misconduct by the CEO of a large Dutch company: although the editorial staff thought it important to publish the article and considered the investigation to be of the proper quality (correct facts, both sides heard, etc.), the proportionality of the publication caused some doubts. As a journalist noted, "When you publish about someone like this, of course you destroy his career … In a [printed] newspaper … you can influence that it is put in a less striking place" or decide, for example, that it is not accompanied by a large photo. "This is still dramatic for the person and the readers often find it very interesting to read. But actually, the proportionality is almost gone. I do not see very well how a recommendation engine can take this into account."

This illustrates that both journalists and developers see a need to retain the possibility for humans to intervene in ANR work to preserve nuances related not only to news selection, but also to the hierarchy or prioritization of news items. As one Dutch data scientist stated:

> "I believe that it is very important always to have humans involved: that automated recommendation technologies are never in place 'instead of' but always in combination with humans who decide what is important news and what is not. And this has simply something to do with the fact that we are not yet able to design recommender systems so good that they can incorporate specific aspects [of journalism]."

Those specific aspects include, as noted by some data scientists and journalists, stories that have severe personal or professional consequences for individuals or that report on cases or individuals known to the journalists and so can be evaluated in more detail because of that prior knowledge. Similarly, a particular significance is attached to journalistic pieces that distinguish the organization from its competitors.[7]

Interviewees also noted the close relationship between objectivity and credibility by arguing that objectivity-related values (e.g. neutrality and fairness) are essential in making the audience perceive the media organization as a credible one. In particular, project owners mentioned credibility as an overarching asset their organization should safeguard, one which also prompts the need to guarantee the credibility of the algorithmic systems it uses. It is interesting to note that, in this context, the data scientists stressed the importance of communication within the organization about the use of ANRs.

Public Service

The importance of the media's task of providing a public service ("as watchdogs or 'newshounds,' active collectors and disseminators of information;" Deuze 2005, p. 447) was rarely mentioned in the context of ANR deployment. To a certain degree, this can be attributed to public service being a foundation of the societal role of the media rather than a value in itself. Primarily mentioned by the interviewed journalists, it was interpreted as the need to "to give an overview of what should be relevant for all of us" and was viewed as a value that can potentially be challenged by individualized news distribution. At the same time, these concerns were dismissed by practitioners with different backgrounds, as shown by a quote from a product owner at FD: "We do not have a public role. We are there for a very specific target group."

The journalists' doubts in relation to the integration of the public service value into ANR design can be attributed to them perceiving the tasks associated with this value (e.g. serving as a watchdog for elites) as a major responsibility of practitioners. Hence, this value is viewed as a foundation on which individualized news delivery should be based because it is essential for all aspects of the media organization's functionality (including ANRs). Similarly, commitment to the truth is understood as part of journalistic core norms that have to be reflected in the content produced rather than in the design of systems used for content distribution.

Autonomy

Editorial autonomy and independence are key journalistic values and substantially affect the practitioners' perception of ANRs and their design. Interviewees (journalists in particular) perceive the preservation of their autonomy as a highly important or even "essential" condition for the shift towards individualized news distribution. The integration of algorithms questions the extent to which journalists are still able to decide autonomously how to give form to values and professional standards, because

of either the complexity of the technology or the fact that they need to rely on third party off-the-shelf products. At the same time, while journalists ascribe utmost importance to integrating the value of autonomy into ANR design, practitioners with other backgrounds suggest that this value should be an underlying principle for the media organization itself and so not something specific to ANRs.

Some practitioners also noted that the deployment of ANRs inevitably leads to a certain loss of their autonomy. One of the user-experience researchers suggested that, with ANRs, "You have to hand over [autonomy] a bit." The same thought was echoed by an FD journalist, who argued that "this hurts me, but in part you do have to give this [autonomy] away. That, I think, is what the whole thing [the recommender system] does." Another journalist stated that this is the reason why practitioners are reluctant to accept the shift to individualized news distribution: "There is also some kind of journalistic pride involved, of course: that we think that we can make the best choices. And that these are ethically justifiable."

Immediacy and Depth

The value of immediacy – i.e. the ability to quickly react to the latest developments in society and to provide reliable information about them (Usher 2018) – and the related values of actuality and speed were referenced by interviewees as important components of ANR design and as "kind of inherent to a newspaper." Similar opinions were also expressed in relation to journalistic depth – i.e. the provision of detailed insights and wide-ranging information on a subject (Hoskins, 2017) – which is also viewed as a classic journalistic task, although one data scientist noted that immediacy and depth can potentially be conflicting values and that this should be reflected in ANR design.

The role of FD as a specialist newspaper plays a part here, as one interviewed Dutch product owner placed less emphasis on immediacy compared to NZZ, which is a traditional news outlet. However, there are important nuances in the understanding of immediacy and its implementation. Together with depth, immediacy is not a "must" condition for every personalized news feed, and the applicability of these values depends on the specific product and its objective. A product owner and a data scientist both noted that ANR can also reuse earlier journalistic pieces or provide a personalized version of the start page, so the exact balance between the values should vary – as shown by the following quote from an FD data scientist:

> "Actuality is also important, not [in the sense] that things have to be topical but more in that this is an aspect in which you want to vary … This has to do with … what a reader needs at this moment. It is possible that you find depth more important than speed on a Saturday afternoon. And, ideally, a recommender system is aware of that."

The balance between delivering the most topical news stories very quickly and recommending other pieces that provide background on them was also viewed by journalists as a possibility for use of ANR to counter the situation in which a reader misses an important earlier story. Similarly, as a product owner noted, experts on a specific topic might expect or benefit from more depth in their individualized news offering, compared to non-experts in that field. However, a journalist voiced a concern that in-depth-articles might be recommended less frequently by the algorithms because such articles are read less often. This observation also points to a greater problem, namely

that the realization of journalistic values in ANRs is not a static process but ultimately one also influenced by the interaction between the ANRs and signals from users (and whether or not they value a particular value the algorithm has been optimized for).

Interestingly, product owners contrasted immediacy with accuracy by arguing that "it is more important that we are accurate than [that we are] fast." Immediacy also relates to audience-related values like usability, as one user-experience researcher added. According to product owners, the latter relationship can be traced back to a frequent updating of the feed during the day and also concerns user agency: "When I say that I do not like this feed, that I would like to have more … articles from the feuilleton section, then I want this to happen immediately."

Accountability and Transparency

While the value of accountability in its broad sense attracted little attention from interviewees in the context of ANR design, related concepts – in particular transparency and responsiveness – were mentioned as important for individualized news delivery. Similar importance was attributed to the value of responsibility, which is usually referred to by journalists as media being responsible for, for instance, creating a certain hierarchy of content. Finally, some journalists also named autonomy as another aspect of accountability by arguing that it is "a bit the flip side of autonomy. This means that you have to stand for what you write, and that you also have to be held accountable for it."

In line with observations from conceptual research on algorithmic accountability (e.g. Diakopoulos 2020), transparency is viewed as an integral aspect of holding the media accountable in the context of ANR deployment. However, the interviewees' opinions on what exactly should be made transparent differed substantially and seemed to align not with specific professional roles but with individual views. Some practitioners claimed that it should be enough to show that news delivery is personalized, so that the users are aware that not everyone might be obtaining the same information. Other interviewees argued that it is also important to explain to users how their recommendation profiles are compiled and what data is used for this purpose, so as to foster trust among them.

One journalist and one data scientist also noted that it is important to explain how ANRs work from a technical perspective, whereas a number of other interviewees, including journalists, data scientists, and user-experience researchers, argued for the particular importance of clarifying how a particular recommendation is made based on user data. Finally, a project owner and a journalist noted that it might also be important to elaborate on the organization's motivation for using ANRs, if only to counteract users' feeling that "they want to sell me something." There was no consensus about whether all these points are (equally) important for ANR deployment. For instance, one product owner even suggested a more minimalist approach to ANR transparency by noting that, "If you can link the start [the input data] to the end [result], then that is actually sufficient to … win the users' trust."

Despite the divergent views on the best way to integrate transparency into ANR designs, including doubts as to whether users are actually interested in having information about ANR functionality, most interviewees noted that this value is important

in the context of individualized news delivery. As one Dutch data scientist observed, the need for transparency is also a transitional phenomenon that is of particular relevance today because the use of ANR is still a rather novel development. By contrast, in the future personalization is expected to be more common and "everyone will be used to everything being personalized. Then I do not think that it will be very important to explain it per se, because people will have a different state of mind." This also creates new responsibilities for the media, however, as a project manager emphasized when observing that, "In this moment of truth, in which you actually give to us the most valuable thing you have on the Internet [your data], we take that seriously."

The motivation for realizing the value of transparency aligns with well-established reasons for increasing transparency in the context of traditional media organizations (e.g. via newsroom blogs). Specifically, transparency was referenced as a key factor in convincing users of the relevance of new technical features. As one data scientist noted:

> "I am convinced that only if you understand what this algorithm is doing and what this service is doing for you can you understand why it is useful for you. That means that already, due to this self-interest that we want to get people to use it, it is necessary to be transparent and to explain what is happening there."

In addition to increasing audience engagement with new features, transparency was viewed as an important prerequisite to realize the value of trust and make users more open towards technical innovations. One journalist noted that transparency is crucial in cases when users do not feel comfortable with a shift towards personalized delivery or even "find it a bit creepy that there is a machine that knows what they want." Under such conditions, the realization of transparency "can strengthen the legitimacy of the choice to use such a system," in particular during the transition period.

A related motivation for integrating this value into ANR design is associated with it being integral to enabling user agency, when deciding either to use a new service or to be more actively involved with it (a view common among the interviewed journalists and product owners). One of the journalists argued that users should be able to ask why they are recommended a particular story and "receive an understandable answer." Moreover, "at best you can adapt it [the ANR] yourself, you can play with it." Similarly, transparency is essential in countering misconceptions about the use of ANRs that, as a project owner noted, are especially important "in times of … Facebook and biased discussions about filter bubbles and things that [provoke] fear around this kind of technology [and] its use."

However, challenges occur especially when it comes to explaining technological details; as one data scientist stated, "We cannot expect other people to have the domain knowledge." Similarly, a product owner noted that the information provided needs to be reasonable in volume:

> "The challenge is to find a balance between how much you explain, so that the need is met and trust is won, without overwhelming someone. Because a person comes to FD to consume news and not for an explanation of how on earth personalization … works."

When media organizations are transparent about their ANR, responsiveness is viewed as a step between transparency and user agency that allows them to open up

the potential of transparency. One data scientist noted that collecting user feedback is important from the technical perspective, to measure the performance of the algorithm, whereas a journalist suggested that being responsive to user feedback can be beneficial because, for example, it increases legitimacy and shows users that they are taken seriously. Hence, responsiveness can serve as an important factor to stress the human component in automated decision-making.

Diversity, Inclusiveness, Cultural Plurality, and Social Cohesion

Interestingly, interviewees (in particular, journalists) do not perceive inclusiveness and social cohesion as central to ANR design despite the concerns about polarization and other undesirable side effects for social cohesion mentioned above. When mentioned, these values were either related to diversity or referenced as being generally important for the media organization but not necessarily connected with individualized news distribution in any particular way. One project manager also noted that these values are not important for the media organization.

Similar attitudes were expressed in relation to cultural plurality, which was usually referred to as part of diversity by journalists or presented by project owners as not important in ANR design. Such reasoning is attributable to two main factors: first, it is argued that users are the ones responsible for deciding if this value is relevant to news distribution; and second, the practical implementation of cultural plurality is considered problematic. One of the journalists compared the realization of cultural plurality to quotas in management positions:

> "This would also mean that people of specific origin [and] with a specific sexual orientation must be included. Oh, now we need to hear from this or that type of person. And I do not know if that produces the best stories."

Despite restrained reactions to the values of inclusiveness and cultural plurality, the broader value of diversity was viewed as important for ANR design. At the same time, there were different perceptions of diversity. Diversity can be understood as a universal standard to which the whole organization should adhere, but is also interpreted as a benchmark for determining user preferences by exposing them to different kinds of content or a means of satisfying user desire to be surprised with a broad information offer as opposed to what one journalist called "too narrow a channel." And while some practitioners argued that matters of diversity should be tackled at the level of content production, others suggested that it can also be translated into algorithmic designs. On a practical level, diversity has a different role at FD due to that newspaper's thematic focus and what one project manager called the "shift in direction to background information, interpretation, so that not all news is evaluated as equally important." Put another way, diversity can mean different things, in part depending on the news outlet in question and its editorial mission.

Perceptions of Audience-Centered Values in the Context of ANRs

Trust

In contrast to the journalistic values presented above and primarily concerning standards of content production and newsroom functionality, trust is a value that relates

closely to how the audience perceives the organization. Although trust is still determined by general journalistic practices (and hence can be treated as an organization-centred value), it primarily concerns the audience and so we relate it to the audience-centred values.

Interviewees frequently referred to trust as a prerequisite for realizing other organization-centred values or as a consequence of upholding them. Specifically, trust is related to transparency, user agency, and credibility (by user-experience researchers in particular), with transparency playing a key role. Practitioners from different backgrounds noted that, to trust the ANR, users need to be aware that their news delivery is personalized and, ideally, need to understand why a specific article is recommended to them. Besides opening the black box of ANRs, building trust in the media-audience relationship also involves other communication channels (e.g. app interfaces and websites). As noted by one user-experience researcher, "Everything has to be in the service of people trusting the information they are reading … and the way in which this is presented, including personalization. I think this is becoming more and more important."

Besides transparency, practitioners also related trust to privacy, with some data scientists noting that users have to know that the media organization deals with their data in a responsible way and respects their privacy. By contrast, project owners and journalists argued that trust depends primarily on news content, with one project owner noting that, "You can write in an objective, and impartial, and credible manner, and with this you build trust." Similarly, an FD journalist stated that users will trust the media if recommended articles fulfil certain values, "And then I do not mind if a human or a robot has done that [recommended the article]." Consequently, trust can be treated as "kind of a checkpoint" that determines if the organization or brand is performing well in general; that is, as a factor that relates first of all to the organization or brand, and only by extension to the way it uses ANRs – a conclusion supported by our earlier findings about user attitudes towards ANRs and the fact that trust in them is guided largely by trust in a brand (Monzer et al. 2020).

The latter findings highlight the strong relationship between the perception of trust and the background of the practitioner. Depending on what the practitioner's role in a media organization is, trust can be attributed to the reliable use of data (data scientists), transparency (user-experience researchers), or quality of journalism (journalists and project managers). These different views of trust make its implementation in ANR design substantially more complicated and require careful negotiations within newsrooms.

Privacy and Data Protection

The close relationship between privacy and data protection was reflected in interviewees often referencing these two values together and arguing that they should be realized primarily through the organization's general data-handling strategy. One data scientist noted that the organization-wide stance towards data protection results in the privacy-by-design principle being used for NZZ's ANR, with the exclusion of personally identifiable information from its functionalities. A similar statement made by a data scientist at FD suggested that general rules concerning privacy and data

protection define ANR design and usage, and that the deployment of personalized news delivery does not lead to the collection of new types of user data (e.g. reading behaviour patterns). Instead, data collection remains the same as "everyone has been doing for a long time, even though they are not doing personalization. Or not doing it yet."

The motivation for upholding the values of privacy and data protection across practitioners with different backgrounds is related to these values' importance for the media-audience relationship and to possible reputational damage due to data misuse or leaks (e.g. as in the case of the Cambridge Analytica scandal mentioned by one user-experience researcher). Interviewees, in particular product owners and data scientists, also noted the importance of privacy and data protection in realizing the values of trust and transparency. One example of these values' interplay, given by a product owner, is the need to respond to user questions such as, "Can I quit this [personalized news feed], or do I have to stay with it forever? What do you do with the data?" This relates to all four values mentioned above.

As noted earlier, the idea of integrating privacy and data protection explicitly into ANR design itself did not attract much interest from the practitioners. While one data scientist noted that the possibility to "let the users decide whether they can turn off those tracks" as part of ANR design can be helpful, the majority of interviewees shared the opinion of an NZZ user-experience researcher who pointed out that the values should be upheld on a higher, organizational level:

> "A user once told me, 'Normally, I would not share data, but with NZZ I do.' And here our responsibility as a heritage company comes into play, to really deal carefully with that trust and hence with the data."

Broad Information Offer and Personal Relevance

Interviewees noted that the search for balance between a broad information offer and personally relevant values is a challenge for both journalistic routines and ANR designs. For some journalists, the opposition of these two values is a major concern in relation to ANR deployment, as illustrated by the following quote:

> "What you are doing as a journalist … when compiling the newspaper … is trying [to ensure] … that the reader gets to see a large number of topics that are all relevant and in which they are not naturally interested per se. … So the weird thing is [that] … the most important thing about news personalization for me is that it does not become too personal."

In contrast to journalists, who are concerned about the preservation of a broad information offer following the deployment of ANRs, data scientists, user-experience researchers, and product managers focus on personal relevance, because "that is why we are doing this [personalization]." For them, ANRs are viewed as an essential means of implementing personal relevance and generating "added value" for users, who read their personalized news feed more frequently and pay for a subscription.

It is important to note, however, that the value of a broad information offer is also relevant for non-journalists, in particular because they admit that too much personalization can create so-called "filter bubbles" (Pariser, 2011). For these practitioners, though, the opposition of the two values is not as pronounced. For example, data

scientists argue that their organizations can in fact provide broad information coverage while still accommodating user interests, and that broad information offer does not necessarily undermine personal relevance.

Usability, Enjoyment of Usage, and Surprise

Usability is viewed as the key audience-centred value in ANR design by most of the practitioners, regardless of their background. As one product owner noted, making ANR easy and accessible "is the only way to get access to users. Users are not willing to jump through hoops anymore." Both journalists and other practitioners emphasized the importance of usability for user satisfaction and enjoyment[8] and financial success: without a user-friendly design, one journalist argued, "We do not sell our things well." Furthermore, usability is considered (by product owners and journalists in particular) an important parameter for realizing the values of explainability and transparency, with one user-experience researcher stating that it is essential for users to understand "what is personalized, what is curated, how I can remove articles, [and] how [articles] are added: [this is] crucial for everything else to work."

Another audience-centred value viewed as important in ANR design is surprise. Related to the organization-centred value of broad information offer, surprise (and its practical implementation) is an important element in newsrooms' decision-making (Schönbach 2007). Hence, journalists in particular often argued for the need to integrate surprise into ANR design by noting that it is a "compelling necessity, because if you are not surprised, you would not come back. Then things become boring … And I think with more surprise comes a broader information offer."

The practitioners from other backgrounds (e.g. product owners and user-experience researchers) supported the idea of integrating surprise into ANR design, but less so than journalists (as one product owner noted, "You do not have to be surprised continuously: it is no 'discovery weekly' per se."). The non-journalists' ideas about the practical implementation of surprise were also different: one data scientist, for instance, suggested that it is of particular relevance for weekend content, whereas a product owner related it to the discovery of new subjects; i.e. "What is behind this, where you would not have clicked [without personalization]?" At the same time, product owners and user-experience researchers noted the complexities of achieving surprise through algorithmic design, as it is a highly subjective value. As one of the product owners stated, "Surprise [and a] broad information offer are a combination of personal relevance and enjoyment of use: this is what is different for everyone."

User Agency

The implementation of user agency as part of ANR design is related to the complexity of finding a balance between user and media control over news delivery. The difficulty of deciding on what one user-experience researcher labelled as "where to position the lever" was reflected in the interviewees' reactions. On the one hand, one journalist stated that it is important to integrate user agency and to ensure "that it is not only a computer that decides what you will read and what not." On the other hand, another journalist noted that this value should not conflict with the tasks and interests of a newsroom and argued that "many people live in their own profession, in their own

world, and this is logically the most important thing. Journalism is in fact finding the balance between a variety of interests and then choosing between them."

While user agency was widely supported by interviewees, journalists and product owners often adopted a more critical stance towards it and argued that this value's implementation in the context of ANRs should be problematized. Overall, practitioners suggested three different options for integrating user agency into ANR design: (1) give users more control over their data; (2) allow users to opt out of personalized news distribution; and (3) allow users to influence the outcomes of ANR. These different views would determine the degree of acceptance of user agency. As one Dutch product manager stressed, it is better to have as little user agency as possible in the journalistic process, "But if it is about real user data, I find it very important that you can influence it."

The third option – the ability of users to influence ANR outcomes – triggered active debates during the course of the interviews. Suggestions for implementation made by practitioners varied from giving users more possibilities to indicate their recommendation preferences (e.g. by selecting preferred topics during registration) to evaluating the quality of recommendations (e.g. by allowing users to indicate that they want more or less recommendations like the one they are now getting). Despite some scepticism about whether users would actually be eager to use these options, journalists in particular argued that it is important to implement this form of user agency to make users more aware that their news selection is personalized. According to NZZ's lead data scientist, however, the realization of user agency in the context of the algorithmic system is a product-related decision that cannot be generalized into an organization-wide policy and so should be implemented on the product level (e.g. for a personalized start page or weekend news feed).

An additional motivation for integrating user agency into ANR designs, and one noted by interviewees from both countries, is to do with its close relationship to the values of trust and transparency. Transparency is understood as a prerequisite for the implementation of user agency, which in turn is closely related to realization of the value of accountability. The relationship between these values is particularly significant in the case of NZZ, where the so-called "trust features" are deployed to give users "transparency and control." One reason behind this is that recommendations can misguide or even offend users; to prevent that, the NZZ product owner suggested that users have "to have the control … to say, 'This was a great recommendation,' or they could even say, 'I would like to see a bit more of this … topic.'"

Discussion

This study has shown a high awareness among media practitioners of the responsibility that comes with the use of ANRs to realize journalistic values. One observation that characterizes most of the findings of this study is that practitioners understand ANRs essentially as an extension of the editorial activities of newsrooms. As such, the integration of ANRs into journalistic routines must adhere to journalistic values. How this can be achieved is subject to intense debate and experimentation. It has become equally clear that news professionals are intensively aware of the importance of their

professional human judgement and active role in defining how ANRs function, thereby defying popular dystopian understandings of technology. Overall, the study has also highlighted a positive attitude towards value-sensitive algorithm design for ANRs. Although journalists, data scientists, product managers, and user researchers attach varying degrees of importance to specific organization-centred and audience-centred values, as noted above several of these occupy a special position across all practitioner backgrounds.

Our analysis has identified a selection of values that are perceived by most practitioners interviewed as "core" journalistic values for ANR design and implementation. These include transparency, diversity, editorial autonomy, a broad information offer, personal relevance, usability, and surprise. Other values, such as objectivity, neutrality, and enjoyment of usage, also seem to be important but are considered as less essential for algorithmic design, at least among the interviewees in this study. Often, there is a debate inside news organizations on whether (or how) to implement these values, in relation to both ANRs and other aspects of newsrooms. More generally, the introduction and implementation of ANRs can force newsrooms to critically revisit and articulate some of their core values and editorial decisions. One important observation was that practitioners felt that some values need to be reconsidered and integrated at the organizational level, rather than (only) at the level of a concrete recommendation algorithm. Examples included the question of privacy, involving strategic decisions at the organizational level concerning what data to collect and also how to use it, as well as how to communicate to users that the news outlet is aware of the specific responsibility that comes with collecting and processing personal data.

Other values (such as objectivity) are better operationalized at the level of the content being recommended. More generally, we observe that interviewees assessed specific values differently according to context. The interpretation of values in the context of ANRs varied depending on whether ANRs were discussed in relation to news production or news distribution (e.g. regarding commitment to truth and diversity), as well as whether the discussion focussed on news distribution and the overall mission of the media organization (e.g. regarding credibility, providing a public service, watchdog role, trust, privacy, and data protection). Different media organizations have different editorial missions (e.g. general purpose outlet vs. specialized news outlet), which again was reflected in attitudes towards and perceptions of news values and their role in shaping the design and implementation of ANRs. Journalistic values for ANRs are therefore difficult to discuss in isolation from a particular news outlet.

This also means that, although journalistic values play a special role in personalized news distribution because they determine everyday decision-making in the newsroom, it is not always possible to identify generalizable conceptualizations that could inform recommender design more generally, precisely because value interpretations and prioritizations can vary between news organizations or even individual practitioners. An important implication of this finding is that responsible, value-aware use and implementation of ANRs require news organizations to engage internally in an organization-wide process of identifying their core values with regard to ANR use, which can subsequently inform their strategies to achieve value-sensitive design. To the outside world, the demands of transparency, but also of user trust, require communication of these

value decisions to users and society. Doing so will also help other news organizations in identifying and conceptualizing their own value-driven approaches to ANR.

Overall, we have found that organization-centred values seem to be viewed by practitioners as particularly important in the context of ANR design, but they also acknowledge the growing role of audience-centred values as newsrooms shift to new digital innovations. Hence, the challenge of realizing journalistic values relates both to the search for new ways of operationalizing them as part of algorithmic design and to scrutiny of the complex interrelations between different values (e.g. some values being perceived as prerequisites for implementing others). The implementation of ANRs therefore triggers a need within news organizations to revisit some of their established values (such as diversity), whereas core values for more traditional news outlets seem less helpful in the context of news recommendations. One example is objectivity as a journalistic core value, which the interviewed practitioners felt was better conceptualized as fairness in the context of recommender design. The implementation of ANRs can also trigger the discussion of established values in the light of new ones (such as the way impartial reporting will relate to issues of privacy).

The importance of the values discussion in the context of the use of ANRs within newsrooms is amplified by observed differences in perceptions of values by practitioners with different backgrounds. While some are recognized as important regardless of the practitioners' background (e.g. fairness, editorial autonomy, and surprise in the case of audience-centred values), the proposed integration of these values into ANR-related procedures differs depending on that background. In the case of autonomy, for instance, journalists prioritize safeguarding the autonomy of editors' tasks and roles as part of the shift towards the use of ANRs, whereas other practitioners are more concerned about this value on the broader organizational level. Similarly, there are substantial disagreements in relation to the realization of other values (e.g. personal relevance or transparency), which highlight the fact that practitioners from different backgrounds tend to commit to different conceptualizations and subaspects of journalistic values that in turn raise additional challenges for their operationalization as part of ANR design.

The importance of addressing the audiences' needs (e.g. by deciding how much user agency is desirable in ANR deployment) leads to a reassessment of the relationship between media- centred and audience-centred values. Specifically, this article identifies new synergies arising between credibility, transparency, and trust, with the latter also being closely related to privacy and data protection. Similarly, the interviewees noted that some values are prerequisites for the successful realization of others (e.g. transparency for user agency and usability for transparency and explainability). These observations indicate that linking traditional organization-centred values with audience-centred ones might be a key requirement for the implementation of value-sensitive ANRs.

Consequently, safeguarding the journalistic DNA remains an extremely challenging objective for media organizations that integrate personalized offerings into their general product. NZZ and FD have in common that they are prioritizing this objective, and also see it as a way to distinguish themselves from competitors – both in the media sector and from other platform services. Analysing these two cases in depth

has revealed concerns about the effect of adopting ANRs on their professional routines and public role, but also shown how the introduction of ANRs can trigger new awareness of established journalistic values and how evolution in thinking about values can reshape human-computer interaction.

The present study has shown that more research is needed to dive deeper into the question of which specific values are applicable and how they are conceptualized on different levels within the organization. Whereas traditionally the conceptualization of values in the journalistic field – also mirrored in self-regulatory documents – mostly related to either single journalists (e.g. being impartial) or the whole organization (e.g. being held accountable), or to either the production process (e.g. how to deal with sources) or the actual content (e.g. trustworthiness), nowadays a new layer is coming to the fore. This new layer of complexity in studying values in the journalistic field is news distribution, which has not previously been in focus but is the central in the context of the growing use of ANRs. The introduction of AI-driven innovations in newsrooms is highlighting the importance of understanding how journalistic values extend to the distribution level, and at the same time raises a question as to whether the deployment of individualized news delivery prompts a need to revisit established values, such as diversity, or to prioritize new ones (e.g. transparency or user agency).

The remarkable differences in attitudes towards the role of journalistic values in the design of ANRs indicate that there is no one-size-fits-all algorithmic solution. This observation highlights the importance of cross-background collaboration between media practitioners involved in the design and deployment of personalized content delivery systems. It also highlights the need for more comparative research, between both individual media organizations and different media systems, in order to understand factors influencing perceptions of professional values and norms during the process of introducing AI-driven innovations in the newsroom.

Our qualitative approach, analysing two case studies, has proven fruitful in addressing this under-studied topic and in answering the research questions posed. Building on the insight gained from these two case studies in the Netherlands and Switzerland, it is now possible to analyse different attitudes towards value-sensitive algorithm design on a larger scale in order to identify which contextual factors relate back to structural aspects such as the media or legal system, journalistic cultural factors, or institutional characteristics of the media organization being studied.

Finally, it is also important to note some limitations of this study. Its findings are based on a relatively small sample of interviews at only two news organizations, both of which are traditional quality newspapers. The selection of interviewees reflected the composition of teams dealing with ANRs in the respective outlets, and so was not fully balanced in terms of age, gender, or race. The choice of media type and the sampling of the interviewees (e.g. the inclusion of journalists in only one set of interviews) could potentially affect the findings. Similarly, future research will benefit from looking at the perceived role of values in different types of media (e.g. public-service media) and contexts. Furthermore, in this article we imposed no explicit definitions of the values under discussion upon the interviewees; in fact, we encouraged them to outline their own understanding of those values. We opted for this way of dealing with different definitions in order to tie these concepts to the practical experiences of the

interviewees. Additionally, providing every interviewee with 34 different definitions would have interfered with a smooth interview situation and been impractical.

Even with these limitations in mind, however, this study highlights the importance of the currently under-studied topic of perceptions of journalistic values in the context of adopting AI-driven innovations in newsrooms. It emphasizes the importance of conducting further research on the integration of these perceptions into both algorithmic designs and the design of organizational routines at the news organizations implementing ANRs.

Notes

1. These values are different from news values, which is another concept from the field of journalism. Journalistic values (e.g. objectivity or transparency) are norms that define what journalists understand as "good" journalism (Beam, Weaver, and Brownlee 2009; Holton, Coddington, and Gil de Zuniga 2013; Ward 2018). News values are factors (e.g. unambiguity or consonance) that make a particular story newsworthy (Galtung and Ruge 1965; Harcup and O'Neill 2001). While the perception of algorithmic systems in the context of news values is an interesting subject by itself, the current paper looks specifically at journalistic values.
2. Despite a growing number of studies looking at the interactions between personalized information delivery and editorial values, most of these studies focus on non-journalistic organizations such as Google News (Haim, Graefe, and Brosius 2018; Nechushtai and Lewis 2019), Apple News (Bandy & Diakopoulos, 2020) or Google search (Trielli and Diakopoulos 2019). By contrast, the relationship between ANRs and practitioners' values in the context of traditional media is approached by only a few studies so far (e.g. Bucher 2017; Bodó 2019; Diakopoulos, 2019).
3. For more information on how ANRs function, see Karimi, Jannach, and Jugovac (2018).
4. For the discussion of objectivity as a traditional journalistic value, see, for instance, Schudson (1978; 2001), Maras (2013). For the discussion of the changing perceptions of the value in the context of digital innovations in the field of journalism, see Aitamurto (2019), Carlson (2018; 2019).
5. Organization-centered values: 1) providing a public service to people as citizens and/or consumers; 2) watchdog of political and other elites; 3) legitimacy; 4) commitment to truth; 5) objectivity; 6) fairness; 7) professional distance/detachment; 8) impartiality; 9) neutrality; 10) credibility; 11) diversity; 12) cultural plurality; 13) independence; 14) (editorial) autonomy; 15) actuality; 16) speed; 17) depth; 18) inclusiveness; 19) transparency; 20) accountability; 21) social responsibility; 22) control; 23) responsiveness; 24) social cohesion. Audience-centered values: 25) trust; 26) privacy (confidentiality); 27) privacy (intellectual autonomy); 28) user agency; 29) usability; 30) personal relevance; 31) enjoyment of usage; 32) data protection; 33) broad information offer; 34) surprise.
6. I.e. Dutch or German with a single exception of one interview conducted in English because the interviewee's mother tongue was not spoken by the interviewer.
7. An example of such distinguishing coverage is the coverage of the Charlie Hebdo attack, when the frontpage of the FD consisted of an image of a broken pen and a commentary. As noted by a journalist, "we were the only newspaper in the Netherlands doing this. So our choice was to distinguish ourselves with this. … It gave us additional self-confidence … also in what we stand for."
8. At the same time, the perceived importance of enjoyment for the ANR design varied between practitioners. Whereas a Dutch data scientist and a journalist present the increase of user enjoyment and engagement as a key objective of individualized news delivery, opinions of other interviewees range from it being "important" or "logical" to "uninteresting" or "not necessary".

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