VALUES IN PUBLIC SERVICE MEDIA RECOMMENDERS

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EXTENDED ABSTRACT

1. INTRODUCTION

Recommendation systems, recommenders in short, selecting and filtering content are widely used by companies in order to provide suggestions for items to users (Ricci et al., 2011). These 'items' range from songs (e.g., Spotify), series (e.g., Netflix), and movies (e.g., YouTube) to messages (e.g., Facebook), job vacancies (e.g., LinkedIn) and products (e.g., Amazon). Public Service Media (PSM) organizations, publicly funded organizations that offer radio and television content to a general audience, can also benefit from recommenders by using them to bring their audience in contact with new content. However, whereas recommenders used by commercial parties often aim to maximize profit or engagement, which is often achieved by recommending items in line with the user's views and interests, PSM organizations have other goals, such as informing the public and exposing them to a balanced mix of different views and perspectives, that could conflict with these commercial recommendation practices. The European Broadcast Union (EBU) acknowledges the tension between serving the audience with recommenders and the responsibilities of PSM organizations (EBU, 2017).

Recently, increasing attention has been paid to the development of recommenders for PSM (Sørensen et al., 2017; Fields et al., 2018; Van den Bulck et al., 2018; Sørensen, 2019). However, though the need for PSM recommenders is acknowledged, research into their design and development is still in its infancy. One of the open questions is what metrics (e.g., diversity or serendipity) PSM recommenders should optimize for (Fields et al., 2018). As a first step towards answering this question, following a Value Sensitive Design (VSD) approach (Friedman et al., 2019), this extended abstract describes a value source analysis (Friedman, 2017), in which an overview of the most important values at stake in the design of PSM recommenders is provided, including a description of where these values come from. The overview is based on a literature study and empirical investigations performed at NPO, the Dutch national public broadcasting organization (NPO, 2019a). Furthermore, some observations regarding the (value-sensitive) design of information systems in general are made.

2. VALUES AT STAKE - LITERATURE

The first set of values relevant to PSM recommenders can be found in literature on PSM. One of the most prominent lists of values for PSM is provided by UNESCO, consisting of universality, diversity, independence and distinctiveness (UNESCO, 2001). *Universality* refers to the accessibility of media content to all citizens in the country, *diversity* involves diversity in content, audience targeted, and subjects discussed, *independence* involves the freedom to express ideas and circulate information, and *distinctiveness* refers to the distinction of one PSM organization from other media organizations.

In addition to PSM values, there are values related to the use of the technology underlying recommenders. As public organizations such as PSM generally have the goal to 'serve the public', they often take public values into account (Jørgensen et al., 2007). Multiple values have been identified as

relevant to the responsible design of information systems (Winkler et al., 2019). In relation to recommenders, most notably, this could mean a responsible use of personal data to protect *privacy* (Hoepman, 2014), and responsible use of machine learning, a technology often used in recommenders, supporting the values of values of *fairness*, *accountability* and *transparency* (ACM FAT).

3. VALUES AT STAKE - IN PRACTICE

We studied values at stake in PSM recommenders in a real-world setting at NPO, the organization that oversees public broadcasting services in the Netherlands. One of the ways in which NPO brings content produced by public broadcasters to the Dutch audience is via its website NPO Start (www.npostart.nl), which makes limited use of a recommendation algorithm. Most of the recommendations on NPO Start are manually curated, but for website visitors with an account (the minority of the visitors), a small part of the recommendations is personalized and generated by an algorithm. NPO is currently working on improving and expanding their recommender. For our study, we attended several meetings at NPO in which the design of the new recommender was discussed, conducted interviews with stakeholders within and out of NPO, and studied project documentation and reports produced by NPO.

NPO's mission is to connect and enrich the Dutch audience with content that informs, inspires and entertains (NPO, 2019a, 2019b), which is broadly in line with the PSM values described in the previous section. Project documentation showed that the most prominent value in the recommender design project was *pluriformity* (the 'explicitly supported value' in VSD terminology). In meetings, a lot of time was spent on discussing what, exactly, pluriformity means with respect to the recommender to be designed. Other values that came up during the meetings were accuracy, privacy and transparency. *Accuracy* of recommendations was deemed important, as users receiving too many recommendations that are not interesting to them would disengage. With respect to *privacy*, it was agreed upon that the recommender should not collect explicit personal information such as age, gender or ethnicity, but only use watching behavior. *Transparency* to users about the origin of recommendations was also deemed important.

In an interview with the head of the development team, responsible for the implementation of the recommendation algorithm (and also part of the project team), we learned that the current algorithm weights five factors: novelty, clickthrough rate, personalization, fraction watched and public values. The last factor, public values is composed of users' ratings of content based on eight values, out of which one is pluriformity (p.62, NPO, 2019c). There is thus a discrepancy between the focus on pluriformity in the redesign project and the (minor) role of pluriformity in the current recommender. With respect to the planned increased importance of pluriformity, the development team neither knew how to translate pluriformity into an implementation, nor did they see it as their responsibility.

Interviews with users, people who watch content produced by public broadcasters on NPO Start, revealed that the majority of users is interested in personalized recommendations, but that most of them were not or only vaguely familiar with the term pluriformity.

4. DISCUSSION

Several insights can be drawn from the results so far. There are several values that the organization wants to embed in the new recommender, most notably pluriformity. Yet, problems are encountered in translating these values into a concrete implementation. Whereas the development team refers to others to operationalize pluriformity so that they can implement the algorithm, other members of the project team have trouble providing such an operationalization, partly because they have limited

programming knowledge and have troubles imagining what developers need. At the same time, the term pluriformity does not appeal to users of the recommender, which may be problematic in providing transparency (another value at stake) about the system. These differences seem to indicate a mismatch between knowledge, culture and languages spoken by different groups of people: (most members of) the project team, developers and users.

A mismatch in understanding of the design challenge and its implicated values between teams in the organization is possibly reinforced by an organizational structure in which employees with different expertise and backgrounds are organized different teams. This is problematic when the goal is to embed values in technology. For example, embedding the value of transparency in a recommender has implications for both the recommender's algorithm and its user interface. On the technical, backend side, the algorithm should be explainable, which may imply avoiding certain deep learning algorithms (Samek et al., 2017). On the user-facing, front-end side, there should be a way to communicate explanations to users in the interface, e.g. a textbox or a button for requesting an explanation for why an item was recommended (Tintarev et al., 2011). If the system does not meet requirements on both of these sides, it will not support transparency. In order to align different components of a system, teams responsible for the creation of these different components need to be aligned as well.

The insights above lead to a more general observation. In VSD analyses, when describing value implications, 'technology' is often treated as a single system and 'the designer' is often treated as a single role (Friedman et al., 2019). However, this is a simplification of (the creation of) a lot of technologies, as systems often consist of different components, which are developed by different teams, consisting of a variety of individuals, with different backgrounds and cultures. We believe that a VSD process could benefit from a more nuanced view on the 'technology' and 'designer', doing justice to their complexities. This may be particularly relevant for complex and intelligent systems, which have a heavy technical component, as well as a user interface.

5. FUTURE WORK

This paper forms a first step towards designing a PSM recommender. Next steps involve analyzing value tensions (Miller et al., 2007); selecting metrics based on these values (Fields et al., 2018); operationalizing these metrics, including weighing them against each other; and designing and evaluating prototypes. This process will be performed iteratively, involving multiple cycles of prototyping and collecting user feedback. In this process, attention will be paid to the multifaceted nature of recommenders as well as their designers.

KEYWORDS: Public service media, recommendation system, recommender, values, value sensitive design, pluriformity.

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