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"THREE DROPS OF BLOOD FOR THE DEVIL": DATA PIONEERS AS INTERMEDIARIES OF ALGORITHMIC GOVERNANCE IDEALS

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ABSTRACT

Governance bodies formulated the universal ideals of algorithmic decision-making. But, the role of data experts acting as pioneers in developing, resisting, and implementing these ideals is not known. This study relies on in-depth interviews (n=24) conducted with Estonian data experts to explore data pioneers' understandings of algorithmic governance ideals. The results reveal dual transformations in the social datafication process where data pioneers develop technologies and intermediate their ideals towards algorithmic solutions. The study highlighted new sectorial 'algorithmic divides', in both data accessibility as well as ideals among data pioneers in public and private institutions. The resulting force majeure in datafication, which prevents private and public sector experts from forming a uniform community, can create a vicious circle of unforeseen negative consequences. Resolving the divides in algorithmic communities and advancing cross-sector cooperation is the basis for forming transparency, accountability and social good as the main ideals in algorithmic decision-making.

Keywords: Social datafication ▪ algorithmic governance ▪ algorithmic transparency ▪ accountability ▪ pioneer communities ▪ algorithmic ideals.

1. INTRODUCTION

Data collection and tracking are universal activities in the 21st century. Social datafication, as the quantification of all kinds of human behaviour and sociality, is disrupting many forms of the social world (Couldry & Meijas, 2019). Social datafication enables real-time tracking, monitoring and predictive analysis (Mayer-Scöhnberger & Cukier, 2013) and has numerous effects, many of them troubling, which could

result in an array of new harms (Kennedy, 2018). Increased use of data and algorithms both in private and public sector organizations have led to discussions about datafied governance and decision-making (Kennedy, 2018) and everyday algorithmic selection (Just & Latzer, 2017; Schäfer & Van Es, 2017).

The widespread hope of combined efforts of public and private institutions is that algorithms potentially increase the efficiency of services by rationalizing bureaucratic decision-making, targeting information and interventions to precise customer profiles, or by choosing the best available policy options (OECD, 2015). One common assumption is that the use of algorithms leads to more fair and objective decisions. In contrast to this normative approach, a more critical perspective has been adopted by many governing bodies and expert guidelines (e.g., Ethics guidelines for trustworthy AI, 2019 or Algorithm Watch & Bertelsmann Stiftung, 2019) as well as by academic research (Pasquale, 2015; Lyon, 2018; Dencik et al., 2019). Research has concentrated on relations between human lives and classification systems (Bowker & Star, 1999; O'Neil, 2016) showing how socio-material classification systems may sometimes, in unpredictable ways, affect human lives. However, there has been little research on how data experts, who use and develop data solutions, understand and practice the universal ideals formulated by governing bodies.

Hepp (2016, 2020) introduced the concept of "pioneer communities" as a framework to examine the perspectives and ideals of collectivities practising and developing technological innovations. This kind of research has emphasized the role of pioneer communities (Hepp, 2016; Hepp & Loosen, 2019) in initiating social shifts concerning social datafication and algorithmic governance, and in inducing new organizational forms and practices. Although we know research has examined journalist, hacker and coder communities and the quantified-self movement of pioneer communities, there is no evaluation of the practices of pioneer communities in actually using and developing data and algorithm solutions. We do not know the social changes, nor the organizational forms and practices induced by data pioneer communities. Lee and Björklund Larsen (2019) suggest the notion of "algorithmic normativity" as a framework for examining ideals in algorithmic governance. This specific kind of normativity, they argue, consists of and covers the technical, socio-technical and behavioural norms these systems may produce. Although research on algorithmic norms has examined both the politics of algorithms and the algorithms in practice (Lee & Björklund Larsen, 2019), the question of how politics and practice intersect has attracted little research. The practices of the pioneer communities in regard to the use and development of algorithms have been suggested as a significant research gap (Latzer & Just, 2020), that hinders defining appropriate governance mechanisms. Our work seeks to contribute to these discussions, which have so far mostly focused either on a theoretical exploration of algorithmic governance or on specific governmental institutions' practices (e.g., Redden, 2018). We view Estonian data experts as an example of a pioneer community engaged not only in the actual analysis and management of data but also actively proposing novel data solutions.

In Estonia, which is known as an advanced digitalized society and a hub for e-governance[1], a new strategy was recently launched to make the country a world-leader in the use of algorithms and artificial intelligence (e-Estonia, 2019). Moreover, Estonia has also stated its aim to serve as a possible test site, for use by other governments, for algorithmic or AI solutions. An example of this pursuit is the project "Kratt" (Artificial Intelligence for Estonia, 2019)[2], which focuses on identifying specific instances where artificial intelligence and algorithms could be used to offer more efficient and better services. During this project, experts intend to develop a near-future strategy for Estonia, defining what needs to be considered when developing artificial intelligence or algorithmic solutions, and which conditions are needed to do so (see Artificial Intelligence for Estonia, 2019). Hence, we can assume Estonian data experts are expected to be pioneers in algorithmic governance. Although Estonia shares a lot about its great success in overall digitalization with the international community, the pressures regarding algorithmic solutions, risks and challenges experts themselves perceive, have remained hidden from the wider public. Our study helps to understand which ideals and norms lead the development of algorithmic governance in Estonia. This study strives to answer the following research questions:

1. How do data pioneers practice, experience, and express their ideals about algorithmic governance?
2. How do data pioneers as intermediaries articulate their algorithmic ideals a) within their professional domain and b) in public – and, thus take part in developing *public algorithmic norms*?

2. THEORETICAL CONSIDERATIONS

2.1. Pioneer communities' role in algorithmic governance

In computer science, an algorithm is defined as a set of steps to process input to produce output desired by specific parties (Goffey, 2008). However, social science is critical of this approach (Williamson, 2015), since it does not take into account the socio-technical complexity of algorithms. In this study, we rely on the understanding that an algorithmic system is not just a neutral code but an assemblage of human and nonhuman actors. The algorithmic system refers to "institutionally situated

1 Several initiatives like the nationwide development of computer networks and internet accessibility "Tiger Leap" (established 1997); the technological platform which interconnects states information systems, "X-road" (2001); Virtual Data embassies to secure the functioning of governmental services from a public state cloud and remote servers in case of cyber-attacks or other emergencies (2017) and E-residency (2014) are part of building Estonia's digital society.

2 In Estonia, 'Kratt' is used as a metaphor for artificial intelligence (Artificial Intelligence for Estonia, 2019), representing both the possibilities new solutions may bring and their inherent risks. In Estonian national mythology, a Kratt is a magical creature - a servant made from hay or old household items, which need constant attention to ensure it does not become idle. The belief is that to revive a Kratt, a person had to give three drops of blood to the devil (Mihkelev, 2017).

code, practices, and norms with the power to create, sustain and signify relationships among people and data through minimally observable, semi-autonomous action" (Ananny, 2016: 93). People who produce algorithms impose their values and belief systems on them (Holtzhausen, 2016). They make value-laden choices during the modelling process of algorithms, which have both foreseeable and unforeseeable consequences (Veale & Binns, 2017). Consequently, a discourse has emerged (Snow, 2018; Hoffmann, 2019) emphasizing the need to make sense of how specific designers or data science teams reach decisions in using and developing algorithmic solutions.

Algorithmic governance as a phenomenon is part of a longer historical trend toward the mechanization of governance. However, the speed, scale, and ubiquity of the technologies that make algorithmic governance possible are qualitatively different now than they were in the past (Danaher et al., 2017). For example, many decisions for people and about people are increasingly made with the help of predictive modelling based on historical data (Žilobaite, 2017). Human designers and engineers maintain and regulate those data systems, and traditional corporate and bureaucrat decision-makers use the information acquired from these data systems. However, there is also a growing willingness to outsource various degrees of decision-making authority to algorithm-based automated systems (Dahaner et al., 2017), where algorithmically generated knowledge is used to execute or inform decisions (Yeung, 2017).

Yeung (2017) uses the notion of *algorithmic regulation* to refer to regulatory governance systems that utilize algorithmic decision-making, which in broad terms refers to regulation as an intentional attempt to manage risk or alter behaviour in order to achieve some pre-specified goal. For example, Facebook regulates the posting and viewing behaviour of users by using algorithmic decision-making systems to optimize the company's profits. Within this article, when discussing the use of digital systems to monitor citizens and give them automatic and personalized incentives to influence their behaviour, we refer to algorithmic regulation as opposed to algorithmic governance. Similar to Katzenback and Ulbricht (2019) we understand algorithmic governance as a broader term that covers a multiplicity of social ordering through algorithmic techniques with regards to all the actors, mechanisms, structures, degrees of institutionalization, and distribution of authority.

Advancements in machine learning and data collection increasingly enable the automation of processes. Researchers argue using algorithmic governance may enhance efficiency, speed, comprehensiveness, and the fairness of state or market (Mayer-Schönberger & Cukier, 2013; Zarsky, 2015). However, no matter how neutral these classification systems may seem, these methods may (re)construct social relationships and the identity of individuals or even vary the nature of the objects they classify (Bowker and Star, 1999; O'Neil, 2016). Moreover, categorizations do not just label people, they can also create groups and alter future outcomes of automated processes (Hacking, 1995). Automated processes are often invisible or 'black-boxed' and immune from scrutiny (Pasquale, 2015; Lyon, 2018). Thus, researchers have raised critiques against these invisible forms of governance and the socio-technical

shaping of citizenship (Dencik et al., 2019), in which public sector institutions adopt the processes, logic, and technologies of the private sector.

Principles of algorithmic governance are often introduced by 'pioneer communities' (Hepp, 2016; 2020) practising and developing technological innovations. In this article, we analyze data experts' perspectives and ideals and consider them to be 'pioneer communities', who act as intermediaries because they have important roles in both developing and implementing new tools and practices. Data pioneers acting as intermediaries (Hepp, 2020) connect producers and developers with users, and the arenas of research, politics and journalism and the economy. Data pioneer communities often share a rather positive view of technology in the public; they also tend to think about themselves as forerunners and therefore act as intermediaries both within a given domain and with the public. Moreover, data pioneer communities will stimulate the change in algorithmic regulation through their visions of possible futures related to algorithmic governance. However, data experts as pioneer communities may remain unnoticed by the general public, which lacks specific insider knowledge to understand the pioneers' role and their impact on algorithmic processes (Hepp, 2020).

2.2. Ideals of governance through algorithms

Implementation of algorithmic systems carries with it several ideals. These ideals have been formulated as responses to possible harms and concerns related to public interest perspective, human rights perspective, ethical issues and, epistemic ideals. From a *public-interest perspective* (Latzer & Just, 2020) risks associated with algorithmic applications include manipulation (Bar-Ilan, 2007), threats to data protection and privacy (Pasquale, 2015), social discrimination (O'Neil, 2016), violation of intellectual property rights (Colangelo & Torti, 2019), and increasing human dependence on algorithms (Danaher, 2018). All these concerns call for systematic risk assessment but also appropriate governance responses as these practices are mobilized to maximize economic and social welfare (Latzer & Just, 2020).

Another dominant set of ideals emphasizes collective and individual *human rights*, which may be violated by algorithmic decision-making (Lazer & Just, 2020). Discussions have concentrated on racial bias in data-driven policing (Ferguson, 2017), the regulation by algorithms of lived experience and identities (Cheney-Lippold, 2017) or data discrimination as a social problem, for instance, in biased algorithms of search engines (Noble, 2018). These concerns emphasize the need to implement universal human rights principles and ideals in algorithmic governance.

Human rights underlie the focus of *ethical debates* about the consequences of automation (Jaume-Palasi & Spielkamp, 2017). For example, Jaume-Palasi and Spielkamp (2017) contend algorithmic solutions could be developed from the publicness (social good) perspective, in the form of a societal frame or collective goods. They argue that as algorithmic services affect collectives, it is not enough if we concentrate just on

individual rights. For example, in the context of discrimination, ethical conflicts in algorithmic processes are inherently collective. Discrimination happens to the individual but is not directed at a specific person (Jaume-Palasi & Spielkamp, 2017). Therefore, they suggest ethics and legal critique that neglects collectives as groups and their logic will remain blind to a large proportion of the problems associated with automation. The publicness perspective's subcategory of 'societal frame' indicates algorithmic solutions as being the platform by which collectives may exercise their basic individual rights and access collective goods. While a few select groups or individuals shape and control a societal frame, it is accessed by many. Many algorithmic solutions developed by the state may be considered through this perspective, like predictive policing. The collective goods perspective, however, indicates services which are not just accessed by everyone, but also shaped and used by everybody. However, collective goods in terms of "justice" or "common good" are dependent on the context of a particular society to do so.

Certain *epistemic ideals* described by Latzer and Just (2020) also emphasize concerns about the quality of evidence gathered by algorithms, as it may be inconclusive, inscrutable and open to error. Focusing on the process of algorithms rather than on its consequences may lead to unfair outcomes (Latzer & Just, 2020) or harmful results (e.g. Eubanks, 2018). For example, automated data solutions may affect peoples' employment, ability to travel or access to benefits. Therefore, concerns related to informational privacy, autonomy and moral responsibility are rising, which is why Latzer and Just (2020) stress the need for the traceability of cause and responsibility for harm.

Several other ideals, like *transparency* and *accountability*, being tightly intertwined with the previously mentioned ideals, have strong relevance in debates about algorithmic governance (Pasquale, 2015; Diakopoulos, 2016; Ananny & Crawford, 2018; Lyon, 2018). A quick shift from rule-based algorithms to machine learning ones (van Dijck et al., 2018) creates specific problems concerning the transparency and opacity of those systems, especially when they are used in already-opaque governance structures (Danaher et al., 2017). The need for more transparency and accountability is emphasized in research but also reflected in policy discourses and regulations like EU's General Data Protection Regulation.

Calls for greater transparency assume that greater information disclosure also leads to greater trust and accountability (Albu & Flyverbom, 2019). Ananny and Crawford (2018) refer to this as a *transparency ideal* where there is a logic in the assumption that observation provides insights, which in turn create the knowledge required to govern and hold systems accountable. Such an idealistic view, Ananny and Crawford (2018) argue, places a considerable burden on individuals to seek out and interpret information about systems. Fung, Graham, and Weil (2007) suggest that transparency should be aimed at being meaningful, which means that not just more information is provided, but also how decision-makers could be held accountable is communicated.

All these ideals – public interest, human rights, ethics and epistemology, as well as transparency and accountability – appear in research and in the public (policy) discourse as necessary elements supporting the legitimacy of algorithmic governance. This study strives to contribute to these discussions by examining the perceived ideals of the data pioneers who use and develop algorithmic solutions in their everyday work.

3. DATA AND METHOD

3.1. Sample

We conducted in-depth interviews with Estonian data experts who deal with *migration data* in one way or another. As migration data is one of the most contested fields of algorithmic solutions, we used that as the main homogenous characteristic for our purpose sampling (Suri, 2011). We identified experts working with migration data by job title or using previous knowledge. The respondents work in the public and private sector, as well as in third-sector, research institutions in Estonia. The sample consisted of both female and male interviewees equally, and all interviewees had higher education (none with less than a master's degree). Our interviewees (N=24) comprised proportionally three groups of data experts: (1) analysts, (2) managers of analysis divisions (who were responsible for some kind of migration data analysis), and (3) developers of software and algorithms. The experts were involved with traditional register data as well as with more recent digital trace data on migration.

3.2. Method

In Spring 2018, we carried out 90-120 minutes long in-depth face-to-face interviews with data experts. A semi-structured interview plan was developed for this study. First, open-ended questions encouraged the experts to express their experiences in using the algorithms, and their opinions about using and developing solutions with large-scale data and algorithms. Secondly, more focused questions examined the experts' understandings of the potential advantages and disadvantages related to big data and algorithmic governance. To encourage the experts to express their experiences and understandings on algorithmic governance, we used several projective techniques (e.g. Soley and Smith, 2008). The experts were asked to reflect upon some of the most typical examples of algorithmic governance implemented in the field of migration: a matching algorithm for refugee resettlement and the use of algorithms in policing. We also used examples of Twitter chat-bots and social media filter bubbles, as sites where algorithmic control is most visible in everyday lives. The interviews also involved questions concerning the experts' understandings about big data and their use of the algorithmic approach when managing migratory groups.

All interviews were conducted in Estonian, the mother-tongue of the experts.

All the interviews were recorded and transcribed by the authors of the article. The interview extracts presented in this article have been translated into English by the authors.

3.3. Analysis

We analyzed the interviewees' (1) responses to spontaneous questions about the use of algorithms in governance, and (2) comparisons and arguments expressed about the presented cases where the algorithmic approaches are used for managing immigration mobility. We used the thematic coding method (Woolf & Silver, 2017) to analyze the textual data of the interviews and MAXQDA to code the text into meaningful categories, and for comparing text extracts within and between categories. After the text was structured thematically, according to the general in-vivo codes, the more conceptual core categories that emerged in the analysis were formulated.

In the following analysis, the positions regarding the algorithmic approaches are evaluated. The researchers' generalizations and conclusive statements are illustrated with extracts from the interviews. To protect the experts' anonymity, all the names of the institutions and organizations which might identify specific experts have been replaced with generic characterizations of people and organizations, but to differentiate the interviewees (INT) we used numbers (1-24) and the interviewee's sector (private, public, third). For example (INT 1, private).

4. RESULTS

4.1. The ideals of efficiency and social good

Efficiency as the core ideal of algorithmic governance (Goffey, 2008), was often discussed by the interviewees. The interviewees understood efficiency in algorithmic governance as the main means for quickening the decision-making process. In response to this ideal of normative efficiency, the unintended social consequences may follow, as interviewees suggested. Therefore interviewees discussed social good as the alternative ideal of algorithmic governance. The ideal of social good as part of the public interest was seen as a solution to the epistemic ideals (Latzer & Just, 2020), that exclusively focus on the efficient process of algorithms rather than on its (possibly unfair) consequences.

Most of the interviewees expressed efficiency as the core ideal of algorithmic governance. However, they did not always emphasize either the potential harm in using algorithms in their work or the exclusive focus on efficiency. Instead, many of them considered algorithms inevitable in certain situations, for example, in public sector authorities and institutions providing vital services. In these situations, efficiency can be enhanced by automated services, which have been sufficiently standardized to be offered through algorithmic calculations. One example of this was applying for

a residence permit, where algorithms could be used to check the criteria based on what a specific person is allowed to stay in the country:

> As residence permits usually are these standard things that you have to check something from databases. And there's the question of whether this decision is made by a human or a machine. (INT15, public sector)

Similarly, in instances of emergencies or critical situations, interviewees say that the use of algorithms has proved helpful. They make the system more efficient and quicker, through prioritizing the calls, this interviewee indicated:

> Here I see potential in such situations when the vital service institution is receiving calls. ... there are certain numbers, which sometimes call ten times a day and nothing is wrong ... Here I see potential ... to prioritize this queue for getting on the line. Which to prefer ... (INT5, private sector)

These examples illustrate the potential of algorithms and automated decision-making in the contexts of resource allocation and efficiency of the services, as also suggested by researchers (Mayer-Schönberger & Cukier, 2013; Zarsky, 2015).

Jaume-Palasi and Spielkamp (2017) elaborate the importance of efficiency as an important ideal. They argue algorithmic regulation examples are often justified not only because they are economically beneficial for the wider public, but also speed up the decision-making processes. Such justifications also point seeing algorithmic regulation through the perspectives of social good. Certain concerns, which may arise are rather oriented towards specific groups or collectives, rather than one particular individual. For example, according to Jaume-Palasi & Spielkamp (2017), discrimination as a consequence of algorithmic regulation happens to the individual but is not directed at a specific person. Our study confirmed this idea, as the public sector experts referred to data analysis being interested in patterns in the data, rather than a single individuals' information. Moreover, certain risks with algorithmic applications, like manipulation, threats to data protection, and privacy (Pasquale, 2015) were associated mostly in association with private corporations like Facebook. Therefore, our study also highlights the concerns regarding institutional privacy when public sector institutions are using individuals' data.

However, the potential risks acknowledged by data experts are more concerned with anonymization and aggregation of data. For example, analysts could, in some data solutions, easily identify certain people, as this interviewee indicates:

> This subject of aggregation and anonymization is quite tricky in Estonian society. We have a small society, but when looking at educational data, we can remove names, higher education institutions. When we are talking about male candidates with a Doctoral degree in the field of arts obtained

> within [the last – authors] three years, this information can be traced back to the person quite easily. (INT1, public sector)

Our interviewees' vision of societal transformations is related to using data and algorithms for better governance and in developing new services and solutions. In this way, the results differ from previous research by Hepp (2020), who argues that scepticism of possible technological futures may be absent among pioneer communities. In our sample, the data experts, especially those working with data about marginalized groups (e.g., refugees), were actually rather cautious. They acknowledged the risks related to categorizations (Hacking, 1995) and data discrimination (Noble, 2018) of data subjects.

Based on our interviewees, the uses of certain algorithms or algorithmic regulations are justified through their publicness - social good (Jaume-Palasi and Spielkamp 2017). Most services are meant to be used by the public, so data experts seeing certain services inevitable and justified may be explained through the collectiveness of those data solutions. However, this study has indicated that the algorithmic collectivities, which data pioneers formed using and developing algorithmic solutions, do not constitute a coherent group. Data pioneers are active in experimenting with the efficiency and effectivity of data solutions and possess not only a sense of mission (Hepp, 2016), but also express conflicting ideals within a single organization, or between private and public sector institutions.

4.2. The interrelated ideals of transparency and accountability

In the context of using automated decision-making and algorithms, several interviewees considered the need for both transparency in decision-making and responsibility of experts for any decisions. We may conclude that these interviewees saw the algorithmic approach as a solution that can be used for supporting decision-making processes. But as algorithms cannot be accountable for wrong decisions, as indicated by the interviewee from a third sector organization, it should be clearly defined who will be responsible:

> It's important that the algorithms are transparent. Or when a certain decision is made that, in the end, a person is responsible. Or, at least ideally, it should be so that if there are decisions that influence people or their lives to a significant extent, it would be good if a person is liable for this decision. (INT12, third sector)

Nevertheless, transparency of algorithms, as expressed by the interviewees, means there is an understanding of what is the basis of a specific decision. Similar to Pasquale (2015), several experts in our study compared algorithmic approaches to a "black box", referring to the notion that how a specific algorithm reaches a

conclusion cannot constantly be checked and understood. Interviewees explained potential biases on the basis that the algorithm may be biased or the person who created might have had a predisposition, as expressed by this interviewee:

> It should be transparent for the decider. (…) If the method itself is a so-called black box method from which nothing can be seen through (…) the creator of the algorithm has no confidence about what basis this decision was made on. Perhaps it learned totally insignificant features. (INT12, third sector)

The importance of the acknowledged impact, by principles like transparency and accountability on various issues, is related to human rights. Experts expressed concerns about racial bias related to data-driven policing (Ferguson, 2017) or social discrimination (O'Neil, 2016; Noble, 2018) that tend to affect already marginalized groups. Indeed, the interviewees emphasized that issues with discrimination arise more from biased algorithms rather than from missing data. The experts associated data discrimination with faulty services or solutions rather than with the choices and values developers of the algorithms may have. One example mentioned by several interviewees was the face recognition algorithm, which has been criticized for its inherent bias. The algorithm gives more false-positive results for people of colour than for Caucasians, as this interviewee indicated:

> It was revealed that the system gives more false-positive hits for the so-called criminals with black people than the white. Well, this could be seen as a racist algorithm. The algorithm is evil. Actually, this is a poorly made algorithm … They are not intrinsically bad. (INT6, third sector)

Clearly, the interviewees do understand that algorithms are simply tools or technological solutions, which cannot be developed and critically evaluated without humans' intervention. However, one interviewee argued the use of data is justified for specifying certain needs and services because that specificity helps service providers to identify those who "actually" need help. Some of the interviewees believed the use of algorithms leads to an increase in fair decisions, which has been one of the norms argued in the context of algorithms (OECD, 2015). This interviewee expressed it this way:

> It seems to me that there are certain features and things which enable us to say that this person needs help. I don't know this yet. I believe that data can be helpful too. We can distinguish those who want a better life versus war refugees – we can distinguish between them. (INT3, private sector)

Transparency and accountability are important ideals mentioned by most of the interviewees. However, they did express some concerns about how certain

information is made visible to the decision-makers rather than the individuals about whom algorithmic decisions are made. Although research has expressed concerns about governments adopting the processes, logic and technologies of the private sector (Dencik et al., 2019), which is only partially supported by our research. Whereas algorithmic regulation is seen to be leading to more efficient governance, public and third sector experts do not seem to share private sector experts' understanding that algorithmic governance leads to more decisions being fair.

4.3. Data pioneers as intermediaries of algorithmic ideals

We also examined how the interviewees, when acting as intermediaries between their field and the public, positioned themselves as a specific pioneer community. The analysis indicates data experts may take on the role of pioneers in their organizations and even see themselves distributing the new type of "data culture", as explained by this interviewee:

> And quite often it is here rather like educating like I have been in this organization for three years. ... I just walked around and introduced what data analytics is, why it is used, and where it can be useful. Distributing this kind of culture so that we could have a data-based organization. (INT11, public sector)

This example highlights how the focus is mostly on skills and specific software when practising and expressing the unique intermediating role of the pioneer communities. By contrast, private-sector experts were more focused on developing new services and solutions, which indicates that lack of both skills and access to data is of concern to the public or third sector data experts, rather than those experts in the private sector.

The data experts see themselves as a community, which has analytic resources for assuring and intermediating the 'social good' through data. However, our interviewees indicated the central problem in their mission and role as intermediaries was the limited access to the data. For example, experts described situations where data may be available only for specific institutions or provided in non-appropriate formats. From the perspective of governmental institutions that outsource their need for analysis, data access limitations complicate the process of assuring 'social good'. For example, this interviewee indicates:

> Quite often, there is a problem when a research institution or university wins the procurement. It is very difficult to get access to the database because, for this, you will need the consent of the Data Protection Inspectorate... (INT15, public sector)

Some of the interviewees also expressed interest in cooperation between public and private institutions. Experts saw this as one of the ways to solve any problems, and to develop algorithmic expert communities. However, in the context described in the next extract, one of the public sector experts notes that private companies may not share data, and collaboration may fail. Since associated parties prefer to support the needs and interests of their own institutions, not only does the cooperation fail but also the intermediation of the public ideals.

> But we cannot have this data. The bank does not share ... once we almost had an agreement with the bank, but it failed because they were afraid that maybe something would not be following their economic interest, comes from it... (INT14, public sector)

Some of the interviewees also wanted to improve access to data and create possibilities for the data to be used by scientists, as well as various officials and analysts in public institutions. Opening up data for these interested parties is seen as a positive solution, although it confers the aspect of a commercial product on data, as this interviewee indicates

> Includes many interesting databases, such as census data, which covers a large part. As a result of that, we can actually interconnect and combine a great database about the whole Estonia ... this would then enable us to make some kind of a product for attracting interest ... (INT2, third sector)

Our analysis indicates data experts treat data as an entity owned by corporations and public institutions and used to create new algorithm-based services and solutions.

Although the human rights perspective and concerns in this relation arise mostly through asking who and how is accountable, the economic and other associated interests of different parties are still prioritized when developing data and algorithms as a "product". Public sector institutions are also adopting specific processes and logic used by the private sector and are thus changing the nature of governance and socio-technical shaping of citizenship (Dencik et al., 2019).

Our interviews highlighted significant differences across types of data experts concerning how they act as intermediaries in the social datafication process. Data experts in Estonia's public sector institutions expressed the importance of developing software and related analytical skills as a means to assuring the mediation of "social good" through data solutions. In this way, public sector experts may be more focused on the technical analysis process where their focus should be on meaning-making through being informed by data (Haardörfer, 2019). Third sector actors expressed collaborative forms of intermediations – cooperation with private companies is seen as the key to supporting social datafication. However, these cooperative forms of intermediations may fail if not viewed economically or in other ways

sufficiently beneficial for the private sector, or in the case of failed cooperation to assure access to the data.

5. CONCLUSIONS AND DISCUSSION

This research strove to contribute empirically to earlier discussions (Hepp, 2016; Lee & Björklund Larsen, 2019; Hepp, 2020) on current tensions in algorithmic governance from the perspectives of data pioneer communities, i.e., actors and experts using and developing novel data solutions. We tackled two questions: (1) how data pioneer communities express their ideals on algorithmic governance, and (2) how do they intermediate their understanding of algorithmic ideals, as part of developing public algorithmic norms. Qualitative in-depth interviews were conducted among data experts in Estonia to evaluate their expressed norms and ideals on algorithmic governance.

Social good, transparency and accountability were expressed as the main ideals by data pioneers in response to the universal and normative ideals on data governance formulated by the governing bodies. These particular expressed ideals are tightly intertwined with the general ideals proposed in previous studies related to public interest perspective, human rights perspective, ethical issues, and epistemic ideals (Latzer & Just, 2020).

Our analysis revealed that algorithmic governance is not just perceived through its potential to enhance *efficiency*, but also through the lens of *social good* (Jaume-Palais & Spielkamp, 2017) of the services and solutions. In the expert interviews, algorithms were mostly viewed from the societal frame. This means that institutions decide by whom, why, and how access to certain services is provided and regulated. This kind of approach allows states to justify some services as inevitable but does not take into account the individual concerns previously expressed in research (Noble, 2018) like data discrimination. In contrast to earlier research (Holtzhausen, 2016), possible problems of algorithmic governance like data discrimination in the case of migration data solutions are explained by bias in the data rather than through the values and ideals developers or experts may impose on algorithms.

The experts interviewed in this study emphasized transparency and accountability as the ideal principles of algorithmic governance supporting previous research (see Pasquale, 2015; Diakopoulos, 2016; Lyon, 2018; Ananny & Crawford, 2018). The study's data experts emphasized the need for a more precise understanding of who is accountable and how, as certain decisions made with the help of algorithms may not be transparent to the decision-makers. Therefore, the results of our study highlight that although legislation may address some of the accountability, there are still "grey areas". This may leave too much room for interpretation for experts in both the private and public sector, which in some situations may lead to new negative consequences.

The results of this research highlighted that data experts act as intermediaries

in developing public algorithmic "normativities" (Lee & Björklund Larsen, 2019), a framework for norms and ideals for using and designing algorithmic solutions. The data pioneers expressed their role as intermediaries not only within their domains and institutions but also in society and among the general public, particularly when communicating the advancements of algorithmic solutions. The dual role of pioneer communities, as Hepp (2016, 2020) suggests, in developing data solutions and acting as intermediaries of their ideals towards technological solutions, was confirmed in this study. Similarly, in the context of mediatization (Hepp, 2020), the duality of social datafication is visible not only in data pioneers' reflexive activities and in the interpretation of their actions but also dealing with unintended consequences when using and developing data solutions.

However, dual transformations in the social datafication process tend to force data experts to act according to the sector, in which they work. Algorithmic pioneer communities do not constitute a coherent collectivity, as suggested in previous studies (Hepp, 2016), but an internally divided community, with different ideals on algorithmic governance. The resulting *force majeure* in datafication, when private and public sector experts do not constitute a unified pioneer community, may lead to a vicious cycle of unforeseeable negative consequences. A united community would, by contrast, be able to realize the ideals of algorithmic governance. Private-sector data experts do not have constraints impeding their development and use of new algorithmic solutions and realize any of the technological futures with all of the unseen consequences they do bring. Public sector data experts are constrained by legislation and institutional rules which the government applies to protect the rights of the data subject that the private sector ignores.

Moreover, we have to take into account the specific field of application as some algorithmic solutions may be more influenced through national and cultural contexts. The conflicting understandings on algorithmic governance ideals, as expressed by private and public sector experts, are visible in the case of the migration data solutions considered in this study. Pioneers' visions of suitable data solutions in the case of sensitive migration data may not always be correct, and they may fail (Hepp, 2020). Irrespective of whether or not their ideas will result in working models for algorithmic governance, the data pioneers push current changes forward in experimenting with the new technological futures. Private and public sector data experts need to seek common grounds and possibilities to work together beyond their institutions and organizations. Hackathons, for example, may be a specific space where the two sectors can practice bringing their disparate ideals together. Questions remain whether and how newly developed innovative solutions can be implemented, especially in the public sector context.

Therefore, as the title of this article suggests, data experts need to be aware of the "devil" e.g., the risks and concerns, or taste at least a couple drops of the "devils medicine", in order to revive public and private faith in algorithmic solutions. However, the aim of the activation of the magical creature of an algorithm is to strengthen the

possibilities for new solutions and to avoid any risks concerning algorithmic governance solutions (Artificial Intelligence for Estonia, 2019). Serving the "social good" assumes increasing cooperation in developing and implementing algorithmic solutions in public and private sector institutions.

Our study focused specifically on Estonian algorithmic pioneer communities but could not discuss whether and how disciplinary backgrounds and skills may also be altering the experiences of data pioneers. Data sharing practices between public and private institutions (e.g. to analyze self-isolation measures), as well as conflicting ideals, are essential in light of the 2020 corona virus pandemic, where specific regulating policies are missing. Therefore, we find it crucial that future policies go into more detail on how and for which purposes algorithms could be used and how this should be regulated during the unforeseen events. This could help in assuring that when in need, the use of algorithms for the collective good is valid.

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