

Open Algorithms: Lessons Learned from the Open Data

Movement

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Abstract

The past few years have witnessed several scandals surrounding public sector algorithms, fuelling the calls for increased algorithmic transparency and accountability. This paper aims to identify lessons for algorithmic transparency deriving from the well-established open data movement and provide a set of recommendations for algorithmic transparency practitioners. To do so, it draws both on the practical experience of open data and algorithmic accountability professionals in the public sector and on the theory and research on open data and transparency. The authors analyse their own experience of working on transparency policies in national governments in France and the United Kingdom, supplementing it with relevant academic research. The paper finds that key challenges in the open data movement include maintaining the high quality of the published datasets, demonstrating real impact, and considerations regarding the purpose. Building on these observations, this research identifies the following opportunities for further developments in the field of algorithmic transparency. Firstly, aiming for meaningful and actionable transparency of both technical and procedural aspects of the systems while involving impacted communities and civil society organisations in designing algorithmic transparency mechanisms from the beginning. Secondly, demonstrating impact through examples and case studies. Finally, improving quality by prioritising what should be open and considering introducing standards for algorithmic transparency. The overarching conclusions in the paper outline the next steps and future research areas in this field in the public sector.

Keywords – open algorithms; open data; public sector; algorithmic transparency

1 Introduction

1.1 Background

At the 2009 TED conference, Sir Tim Berners-Lee invited the audience to join him in the call for "raw data now" (2009). This event raised the profile of open data and increased its popularity at the international level. In 2020, a crowd of students in London protested against an exam scoring algorithm to the rallying sound of "F... the algorithm" (Smoke, 2020), echoing similar controversies in France concerning the higher education entrance system Parcoursup (Corbier, 2020). Although dramatically different, these two events could serve as symbolic founding moments for the open data and open algorithms movements. Within a decade that sets them apart, open data gained traction as a driver of innovation in the public sector and the economy, and as a tool for increasing the public sector's accountability (OECD, 2020). Promoting public sector transparency was a crucial aspect of the political climate at the time. In 2009, the Obama administration was a strong proponent of open government, promoting the open data movement at the national and international levels. The Open Government Partnership (OGP), established in 2011 at the initiative of the US Government, has successfully grown to 78 countries. In the past ten years, open data practitioners have been exploring the potential and limitations of their approaches to openness and transparency. Simultaneously, the popularisation of automated decision-making systems and artificial intelligence in the public sector raised concerns about the insufficient transparency of how these systems operate (AlgorithmWatch, 2020). Researchers, journalists, and civil society organisations explored the

risks, impact, and documented the limits and pitfalls of automation in delivering public services, for instance, in the fields of education (Terra Nova, 2018) or welfare (Eubanks, 2018). These studies criticised the opacity of algorithmic systems and their lack of accountability and urged for increasing transparency in the field.

Similarities between open data and open algorithms begin with accountability being the overarching goal of both movements. Open data and open algorithms often rely on the same legal basis, for example, the Freedom of Information or public law in France. In practice, open algorithms and open data raise similar strategic and operational questions: which algorithms should be published first? What impact will this openness have? What is the target audience for these initiatives? Therefore, the emerging work on open algorithms would benefit from the experience gathered throughout the years through the open data movement.

1.2 Research questions

This paper aims to identify key lessons and recommendations for algorithmic transparency deriving from the well-established open data movement and provide a set of recommendations for algorithmic transparency practitioners. It analyses the following aspects of open data and algorithmic transparency: (1) the quality of data; (2) the impact of transparency initiatives and their purpose (3). The paper elaborates on challenges and opportunities in these fields and determines how they can inform the ongoing work on increasing algorithmic transparency in the public sector.

1.3 Methodology

The research draws on the authors' practical experience of working on transparency policies in the public sector and is complemented by theoretical knowledge on open data and algorithms. As the authors of this research work in Europe, one potential limitation of this study is that the insights produced are Eurocentric and specific to France and the United Kingdom. In this paper, "open algorithms" are understood as a term encompassing fairness, transparency, and accountability of algorithms used to support decision-making in the public sector. While this paper acknowledges the semantic differences between them and the ambiguity of the notions of fairness, transparency and accountability, the terms "open algorithms", "algorithmic transparency", and "algorithmic accountability" are used interchangeably in this paper.

2 Key findings

2.1 Challenges regarding quality

In the past ten years, the open data movement has faced several challenges similar to those encountered by algorithmic transparency practitioners at present. The first challenge derives from the "open everything" approach that drove the first wave of open data that emphasised the number of published data sets rather than their quality (OECD 2020). This attitude resulted in the insufficient quality of open data that often hindered efforts to reuse it. As Dodds and Wells (2019) put it, "many early open data initiatives and advocacy campaigns encouraged governments to release a standard list of discrete datasets and to upload them to central data portals, rather than adopting tailored approaches to discussing, releasing, and supporting the use of data that met the needs of local communities". The political will and the urgency to open as much data as possible overshadowed considerations on data standards, quality, and reuse.

Although the algorithmic transparency movement is not as focused on reusability as open data, there are parallels in the negative implications of their negligible quality. For instance, the source code of the French higher-education admissions education algorithm APB was first released in 2016 through scanned PDF files (Conge, 2016). As a result, it was impossible for developers and data scientists to analyse it without rewriting it in computer-readable code, which was the primary motivation to publish the code in the first place¹.

2.2 Challenges regarding impact & public awareness

Demonstrating the impact of open data has been challenging due to the lack of common measurements and indicators². Therefore, a sceptical view on the movement would point out that the promise of open data to transform public policy and increase public engagement has not lived up to its full potential (OECD 2020). This sentiment resulted in the field questioning itself. In 2018, the Open Data Charter (2018) updated its strategy by "shifting their norms" and recognizing that "that opening up data in isolation is less effective than if targeted at solving specific policy problems, and that they continue to represent the gold standard for what good open data looks like". Similarly, the lack of public awareness on the topic hampered the potential for demonstrable impact of the

¹ Although this example is about opening source codes, it is important to remember that algorithmic transparency should not be limited to the technical aspects of the system, but should be understood as encompassing the system as a whole, including the role of humans in the process and the policy choices made.

² Although initiatives do exist, see for example Open Data Charter (2017).

movement. For open data to drive real change, there is a need to find active methods of involving and educating the public. For instance, as demonstrated in the case of Kosovo, where open data and ICT skills training were the key drivers of empowerment and civic participation in local communities (Domagala, 2020).

The call for open algorithms emerged in a different context than for open data and is usually associated with scandals around discriminatory or unjust results produced by these systems. Yet, the question of impact remains the same: what should one focus on to ensure that “opening” algorithms brings greater accountability to the public and is a driver for more equitable public service delivery? How can one include social equity and feedback loops in open algorithms? Moreover, how can we open up processes to challenge the purpose of algorithms? Many practitioners struggled to address these questions as the notion of algorithms in policy and service delivery is multidimensional and challenging to comprehend, even for public servants active in the field. During a working group conducted on algorithm registers in France (see Pénicaud, 2021), a public servant in charge of opening algorithms explained: “[When we asked them if they were using algorithms in their decisions], many agencies immediately dismissed the question, saying: “we don’t have algorithms, we don’t have super-machines that will give you a result from super entry data [sic]”. We then rephrased the question and asked if they have procedures that are systematic enough so that data entered into them produces a result that informs an administrative decision. This lack of understanding was our greatest difficulty”. Further challenges emerge due to the lack of positive incentives to drive this type of work in governments other than avoiding potential scandals, especially in departments with scarce resources.

2.3 Challenges regarding the purpose

The first two challenges identified in our work as practitioners pertain to the question of “why transparency”. The first wave of the open data movement relied on a “build it and they will come” approach, meaning that if data was at everyone's disposal, civil society groups and the public would make something out of it.

This sentiment echoes issues encountered in the open algorithms movement based on the belief that transparency of technical components (e.g. data) is sufficient to guarantee the accountability of these systems. However, as Ananny and Crawford (2016) put it, “showing” is not “knowing”, and transparency does not automatically entail accountability. A legal framework around transparency and explainability of public sector algorithms introduced in France (Chignard & Pénicaud, 2019) recognises that and highlights algorithms as sociotechnical systems. It encourages greater

explainability and transparency around decision processes and policy-making choices as a whole. Although creating momentum around algorithmic transparency in France has been invaluable, it is not enough to ensure full accountability. The lack of systematic sanctions and difficulties to obtain redress mean that agencies are hardly ever held accountable for faulty algorithms. The issue of low public awareness mentioned in the previous challenge is also illustrated by the scarcity of appeals and the freedom of information requests around algorithms in France (Cellard, 2019).

These factors invite a consideration of the “why” of open algorithms: the purpose of governments being open and transparent is so that the public can exert their rights and hold the government to account. The opening of algorithms also responds to the need for public servants to stay in control of the decisions they make. As algorithmic systems advance, public servants often struggle to understand them. Algorithmic decision-making tools such as scoring algorithms could create doubt or result in public servants limiting the use of their human expertise and increasing reliance on the algorithm, as it is difficult for them to understand where the decision came from. In France, user experience tests around the explainability of risk-assessment algorithms for ship control (Loridant, 2019) have shown that public servants can be overwhelmed by too much information about the system and end up blindly trusting the data scientists in charge. In summary, openness must be considered in the context of both accountability towards the public and control over decisions by public servants.

3 Recommendations

3.1. Striving for meaningful transparency

According to Hong (2020, p. 44), there is no easy connection between the theoretical availability of information and its uptake as knowledge. In the context of liberal, representative democratic societies, transparency functions as a mechanism mobilising the citizens to become “a free auditor for the state” (p. 46) that can monitor and scrutinise the actions of the government. Thus, for Hong (2020), there is a risk of transparency becoming a burden that members of the public are not able to bear, in particular when interacting with an overwhelming number of datasets with irrelevant or impenetrable information. Similarly, Crawford and Annany (2016) emphasise that mere visibility is not bound to evoke understanding and that accountability cannot be achieved without the availability and legibility of information and the ability of the audiences to understand and interpret it. Therefore, there is an emerging need to reconsider what forms of transparency would be the most effective in facilitating understanding and reducing the burden on the general public. Loi,

Ferrario, and Viganò (2019) propose a form of transparency for algorithms where the design of an artefact (including value, translation and performance) is publicised as well as its consistent application. This method aims to provide explanations to see through, access, and analyse models trained on data using machine learning through revealing their following aspects: 1) an explanation of the artefact, namely, an explanation “by design”; 2) an intentional explanation of its deployment; 3) a justification of its use; 4) when used consistently, a procedural justification of the individual decisions it takes (p. 17). In their pursuit of the definition of algorithmic transparency, Safak and Parker (2020) expand the existing accounts by emphasising that any transparency systems must maintain the connection with how algorithmic systems relate to the real world, tracking the shifting influences of technology, governance and economics, and the public and private actors embedded within them. The challenge of achieving meaningful transparency becomes a challenge of building trust, rather than visibility, and additional information should be provided on what are the values and intentions that algorithmic decision-making systems have been deployed with. Therefore, Safak and Parker (2020) describe meaningful transparency as “providing the public with the necessary tools and information to assess and interact with algorithmic decision making systems as public services. In practical terms, this means amplifying existing mechanisms that keep public services in check and making information available to the public with the authentic intention of engaging them in decision-making processes”.

Based on the definitions outlined above, this paper recommends that policymakers striving for meaningful transparency in the use of algorithms facilitating decision making in the public sector ought to begin their quest with the following questions: what is the goal of releasing information about the use of algorithmic systems in decision making? (1), and “who is this transparency for” (2) to improve their comprehension of the target audience and consider how the burden of understanding can be reduced effectively. This could be achieved through creating opportunities for public participation in policymaking and working with the public to define their needs in terms of the specifications of the systems that need to be made transparent, the type of information that should be delivered, and the format in which this information ought to be presented to facilitate feedback loops. A recent example of deliberative engagement in defining the scope and scale of algorithmic transparency measures comes from the Central Digital and Data Office and the Centre for Data Ethics and Innovation in the United Kingdom who commissioned a research consultancy BritainThinks to explore which algorithmic transparency measures would be most effective at increasing public trust and understanding about the use of

algorithms (Domagala, Spiro, 2021). The initial levels of awareness about the topic among the public were low. Using a deliberative process enabled participants to gradually build up their knowledge and opinions about algorithms in the public sector, share their experiences on the topic, and express their expectations for transparency. In the final stage of the project, researchers worked collaboratively with participants to develop a prototype information standard that reflected their needs and expectations regarding the transparency of algorithms in the public sector. Similarly, member countries of the Open Government Partnership group on open algorithms have been deploying participatory methods in algorithmic policy development more broadly; for instance, New Zealand undertook extensive public consultations during the framing of the Algorithm Charter (Turek, 2020). This paper recommends scaling up the use of deliberative methods in algorithmic transparency policies and strengthening global collaboration on the topic to facilitate knowledge exchange and jointly tackle common challenges.

3.2 Aiming for impact

Algorithmic transparency is a dynamically emerging area; nevertheless, there is a scarcity of comprehensive examples of transparency measures delivering greater accountability and positive societal impact. In the past decade, a plethora of extensive case studies investigating the impact of opening up public sector data has been published. The non-exhaustive list includes examples of open data improving government, empowering citizens, creating economic opportunities, solving public problems (GovLab, n.d.); detailed accounts on the benefits of open data for the public sector (World Bank, n.d.); opportunities for value creation (European Data Portal, 2020); critical assessment on its progress and effectiveness in addressing challenges related to socio-economic development and democratization (Davies, Walker, Rubinstein, Perini, 2019); and new open data ecosystems in the local context (Lämmerhirt, Brandusescu, Domagala, Enaholo, 2020). Therefore, a crucial lesson from the open data movement that this paper recommends is to capture, evaluate, and disseminate accounts that demonstrate the significance of proactive algorithmic transparency measures. A collection of positive examples would provide evidence for future uptake and encourage other public sector entities to adopt algorithmic transparency policies.

In addition, the emphasis on increasing the positive impact of these initiatives also implies engaging the public to support the capacity and community-building efforts and increase algorithmic and technical literacy. One example of this could be a series of comics by Stoyanovich, Sloane, and Arif Khan (2021) developed to provide a new understanding of artificial intelligence and

its impact on daily life and enable individuals to critically evaluate AI technologies.

3.3. Focusing on quality

In order to increase the quality of information gathered through algorithmic transparency measures, this paper recommends prioritising what algorithmic systems should be made transparent in the first instance; providing clear definitions of which systems are classified as algorithms for the needs of transparency reporting; and considering development and deployment of unified standards to present this information.

Governments should identify the highest impact algorithms that would be prioritised when introducing algorithmic transparency measures. The challenge of determining what algorithmic models should be in scope needs a comprehensive review of the existing uses of algorithms and AI in the public sector alongside consultations with external experts. Definitions of algorithms from Canada or New York City could provide a helpful starting point for other public sector bodies grappling with this issue. In New York, examples of algorithmic tools include but are not limited to risk scoring instruments, categorisation or grouping algorithms, and optimisation models (Thamkittikasem, 2020). Often such tools incorporate artificial intelligence or machine learning techniques. There is a set of additional criteria to further specify which systems are in scope. In particular, a system must be derived from complex data analysis approaches, or routinely employ complex data analysis approaches to operate; support agency decision-making; and have a material public effect (ibid.).

The Open Algorithms Exchange convened by the Open Government Partnership has been leading a discussion about international standards and potential reconciliation of different approaches. Turek (2020) flags that standards could be more effective if accompanied by a professional accountability body, grievance mechanisms, and supported by an appropriate legal framework. Currently, no global standards for algorithmic transparency exist. Nevertheless, there have been attempts to identify the categories of information that should be prioritised. For instance, The European Parliament's Panel for the Future of Science and Technology (2019) suggested transparency in the following areas: data, algorithms, goals, outcomes, compliance, influence and usage. Similarly, the cities of Helsinki and Amsterdam adopted a standardised approach developed by Saidot, with the following categories of information being made available: datasets, data processing, non-discrimination, human oversight, risk management. In addition, a designated accountability section provides details on the department where the algorithm is being used, responsible organisations and

departments, contact details, and any external parties involved (Haataja, van de Fliert, Rautio, 2020, p. 7). Moreover, Haataja, van de Fliert, and Rautio (2020) recognise that there are varying levels of information needs and identify the existence of potential bottlenecks for how to enable provisioning of such information in its most detailed level (p. 10). The issue of categories and prioritisation of information to be made publicly available has been raised by the Centre for Data Ethics and Innovation and the UK's Central Digital and Data Office. Their report (BritainThinks, 2021) resolved the tension between transparency and simplicity by allocating information categories to different tiers. Tier one should contain basic information about the purpose and description of the algorithm and it should be immediately available at the point of, or in advance of, interacting with the algorithm. Tier two would cover all the remaining categories (including data, privacy considerations, human oversight, risks, impact, technicalities, commercial information) and be easily accessible for those willing to find out more (2021, p. 18).

Conclusion

Following the analysis of challenges and recommendations in open data and open algorithms, the paper proposes the following overarching conclusions:

Understanding the limitations of transparency is key. Although openness is a crucial aspect of the responsible deployment of algorithms in the public sector, there is a need to rethink the wider organisational and power structures in which algorithms operate. Therefore, further research should be conducted to embed algorithmic transparency within governance mechanisms and enable opportunities to challenge them.

The wider dynamics of the open algorithms movement differ from those of open data. Political buy-in and enthusiasm in the open data movement were significantly different to the current climate within which open algorithms operate. In the open data movement, the emphasis was on open data as the solution to the issues with trust, transparency, and accountability of the public service organisations. In open algorithms, the focus is on the problem of insufficient transparency in how algorithms are used and the lack of public trust.

Further research is required in the emerging field of algorithmic transparency, especially using methods to observe its implementation on the ground. Based on the research gaps identified when working on this paper, we would like to encourage additional inquiries into the concept of meaningful transparency, algorithmic

accountability and governance structures, and international standards for open algorithms.

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