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The benefits and harms of algorithms: a shared perspective from the four digital regulators
- BCS Briefing

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This document

This is the BCS briefing for the UK government's research and analysis paper[1] 'The benefits and harms of algorithms: a shared perspective from the four digital regulators'.

1   Purpose of the DRCF research and analysis paper

The four government regulators with a remit concerning data and algorithms are:
- CMA[2], the Competition and Markets Authority
- FCA[3], the Financial Conduct Authority
- ICO[4], The Information Commissioners Office
- Ofcom[5]

These regulators have an influential role in shaping the algorithmic processing landscape to benefit individuals, consumers, businesses, and society more broadly. The National Data Strategy[6] committed these regulators as members of the Digital Regulation Cooperation Forum (DRCF) to discuss what role, if any, they should play in regulating algorithmic processing of data in the industries that they regulate.

The DRCF paper is the result of a year long analysis by the regulators and is an initial assessment of the benefits and harms that can arise from the use of algorithmic processing in the delivery of digital services. It provides input to the consultation[7] on 'Auditing algorithms: the existing landscape, role of regulators and future outlook', which BCS will be responding to.

The DRCF paper identifies the following cross cutting areas of mutual interest that the regulators will collectively focus on as a result of their analysis:

- Transparency,
- Fairness,
- Access to information,
- Resilience of infrastructure,
- Individual autonomy
- Healthy competition

In particular their paper discusses

- where and how algorithmic processing is being deployed in the sectors DRCF regulate
- the benefits and harms associated with those applications
- the extent to which those harms are currently being mitigated
- the type of issues that may arise in the future as the use of algorithmic processing evolves

The paper proposes that the DRCF could establish greater consistency in the way they engage with citizens about algorithms to enable them to better understand what algorithms are, where they're used, and the choices available to consumers.

2   DCRF request for feedback

DCRF regulators are asking for feedback on their discussion document covering these questions:

- What are your overall reflections on the findings of their paper?
- What other issues could the DRCF focus on?
- Which area of focus does the DRCF have the most potential to influence and which would you prefer the DRCF prioritised?
- What outputs would consumers and individuals find useful from the DRCF to assist them in navigating the algorithmic processing ecosystem in a way that serves their interests?
- Do you have any evidence on the harms and benefits of algorithmic systems you would like to share with the DRCF?

The rest of this briefing covers each of the focus areas identified as priorities by DCRF and the points covered in their discussion document.

3   Transparency

The DRCF paper highlights that transparency provides the following benefits

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[7] https://www.gov.uk/government/publications/findings-from-the-drcf-algorithmic-processing-workstream-spring-2022/auditing-algorithms-the-existing-landscape-role-of-regulators-and-future-outlook

- Purpose: being clear to the user about both the purpose and the nature of the system (for example whether it is entirely automated or includes input from a human)
- Knowledge: about how and where the system is used, including the data being processed
- Accountability: regarding the extent of human involvement, and where human accountability lies
- Justifiability: communicating where a decision is made, and the justification for that decision
- Impact: the likely impacts of the algorithmic processing for the individual It is important to note that transparency can sometimes result in unintended consequences, with algorithmic models being gamed or exploited if people know too much about the processes underlying their outputs.

Given the complex supply chains behind information systems, DRCF point out that identifying who is accountable for what is difficult in a regulatory context. They also point out that it is sometimes difficult for those adversely affected by algorithmic information processing either to understand their rights or how to execute them. Despite the fact UK law allows individuals the right to be informed of the underlying logic of an algorithmic system. That is of little real benefit for complex algorithms where even experts in the relevant field would find it difficult to understand them, or where algorithms are based on stochastic inference engines where there is no explicit logic (such as Machine Learning models).

4   Fairness for individuals affected by algorithmic processing

The report points out that generally people do not intentionally design algorithms to be unfair, and the issues of fairness are often down to unintentional bias in the data that algorithms process. This could be a result of latent variables learnt from data training sets, in for example, machine learning. This occurs where a set of data is statistically correlated with another attribute without that being made explicit in the data or resulting model, but where that attribute is then used to determine the output of the algorithm. For example, car engine size is known to be correlated with gender. This could mean insurance premiums that take car engine size into account would affect men more than women, and gender would become a latent variable.

The report also points out that fairness is context dependant, and algorithms deemed fair in one context may not be if adapted to another context. Healthcare being a notable example, where machine learning models that perform well in one hospital or location perform sub-optimally at a different hospital.

The report also highlights that it is possible under certain circumstances to develop algorithms to be used to detect bias and discrimination.

5   Access to digital markets, including information, products, services, and rights

The report discusses how algorithms may limit peoples access to information, products, services, and rights. In particular how access may limit peoples exposure to:

- alternative viewpoints, and to
- economic opportunities

It also discusses how algorithmic processing can assist in widening access to digital markets. For example in finance it may be possible for algorithms to empower consumers with unique insights into their financial needs.

6 Resilience of infrastructure and algorithmic systems

The report considers when it might be possible for bad actors to target the development of an algorithm to inflict damage. For example through the poisoning of training data for a machine learning model, in order to degrade the model's performance. E.g. maliciously adding corrupted data to interfere with a bank's automated fraud detection system. The other scenario considered in the paper is the creation of algorithms to automate unlawful activity. Such as for example automating the generation of phishing emails tailored to people's backgrounds and personality traits.

Apart from these risks the report also discusses how algorithmic processing can be used to enhance the resilience of infrastructure and users to cyber threats, scams and fraud.

7 Individual autonomy

The section on individual autonomy includes a discussion of
- Manipulation through unrestrained targeting
- Manipulation through harmful choice architectures
- Control and protection of personal data

The paper also discusses how algorithms can be used to enhance the user experience and enable individuals to make better choices via specific design choices on social media platforms.

8 Healthy competition to foster innovation and better outcomes for consumers

The section on healthy competition includes a discussion of
- Issues with anti-competitive behaviour in recommender systems and search engines
- The risk of connected algorithmic systems
- Data power

The paper also discusses how algorithmic processing can foster competition by helping customers connect with a greater number of providers, as well as helping firms to access consumers, hence reducing the barrier to entry in some markets.

9 Additional discussion topics in the report

The DRCF paper also includes a discussion of a set of topics suggested through stakeholder consultations that were not originally within the scope of the report. These include
- Human 'in' or 'on' the loop. Which covers when a human can meaningfully provide informed oversight of an algorithmic processing system, and when escalation of an issue is better handled through automated governance processes.
- Impact of algorithmic processing on climate

- Data governance

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