RESPONSE to

Competition and Markets Authority

Consultation on Algorithms

16 March 2021

Contents

Executive Summary

This document (JD020) is a Response from Just Algorithms Action Group (JAAG) to the Open Consultation from the Competition and Markets Authority (CMA) on the Paper from the CMA's Data, Technology and Analytics (DaTA) Unit:

"***Algorithms: How they can reduce competition and harm consumers***"

We consider the CMA Paper to be a significant step forward in tackling one of the biggest issues facing society. "Lifting the lid" is a very apt expression. It raises many points that are central to JAAG concerns, or speak directly to them.

JAAG works to counter the injustice and lack of consideration of many modern computer-based systems in their real world use, and the malign impact they can have on human beings. JAAG is a not-for-profit membership organisation.

The problems which JAAG is seeking to address will not be solved overnight and are likely to get worse before they get better, as AI and algorithms proliferate unregulated and unaudited.

Our document contains 33 observations, suggestions and recommendations in response to the eight questions posed by the CMA under the headings: Theories of harm; Investigative techniques; and Role of regulators. We have also raised a smaller number of additional points which we consider will bear on the Digital Markets Unit in the coming months and years.

The CMA Paper raises many deep-seated issues and it is difficult to say which of them should receive priority for attention. However, there are three issues which need particular attention:

      (1) the dangers which "algorithms" pose to children and vulnerable adults over and above the general population.

      (2) the additional issues which need to be addressed in systems which are partly executed by human agents.

      (3) the need for pro-active regulation.

We welcome the CMA invitation to interested parties to participate in the Algorithms Programme and we hope that JAAG will be able to make a useful contribution. Experts from many disciplines will be needed to help tackle the problems that lie ahead of us.

1. Introduction

This document (JD020) is a response from Just Algorithms Action Group (JAAG) to the Open Consultation from the Competition and Markets Authority (CMA) published on 19 January 2021 and titled:

"Algorithms, competition and consumer harm: call for information" [1]

The Consultation is based on the CMA paper

"*Algorithms: How they can reduce competition and harm consumers[2]*

We refer to this paper throughout this Response as "the CMA Algorithms Paper", sometimes abbreviated to "the CMA paper" where there is no risk of ambiguity.

Publication of the CMA Paper was foreshadowed in December 2020 when the CMA published its Draft Plan for 2021/22[3] . The Draft Plan included a proposal to:

"publish a paper in relation to how consumers are presented with choices online and the related behavioural science, and highlight gaps in our knowledge where we would like to see more research done"

and to invite

"academics or other organisations who would be interested in collaborating on our algorithms programme to contact us"

In JAAG's response to the CMA Plan Consultation in late January[4], we expressed the intention to prepare this current document.

JAAG works to counter the injustice and lack of consideration of many modern computer-based systems in their real world use, and the malign impact they can have on human beings. JAAG is a not-for-profit membership organisation; the founding members have a Quaker background.

The press release which accompanied the publication of the CMA Algorithms Paper is titled

"CMA lifts the lid on impact of algorithms"[5]

"Lifting the lid" is a very apt expression. JAAG is under no illusions about the scale of the problems we face and the difficulties we will all encounter in seeking long term solutions. Nobody knows what will come out of the box in the years ahead.

We consider the CMA Paper to be a significant step forward in tackling one of the biggest issues facing society. It raises many points that are central to JAAG concerns, or speak directly to them.

We are greatly encouraged that the CMA is giving such a high quality lead in this area. The Digital Competition Expert Panel in March 2019[6], reported that a pro-competition policy would "help unlock the opportunities of the digital economy."   The CMA led the Digital Markets Taskforce, which reported in April 2020.[7] With the CMA Algorithms Paper now published and out for consultation, the CMA seems well on its way to establishing its Digital Markets Unit (DMU) as part of its Digital Markets Strategy and moving forward on the twin fronts of promoting healthy competition and protecting consumers.

And now we welcome the publication (10 March 2021) of the 2021/22 work plans of the Digital Regulation Co-operation Forum.[8]

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[1]   https://www.gov.uk/government/consultations/algorithms-competition-and-consumer-harm-call-for-information

[2]   https://www.gov.uk/government/publications/algorithms-how-they-can-reduce-competition-and-harm-consumers

[3]   https://www.gov.uk/government/consultations/cma-annual-plan-consultation-202021

[4]   CMA Consultation Annual Plan 21/22 — Just Algorithms Action Group (JAAG)

[5]   https://www.gov.uk/government/news/cma-lifts-the-lid-on-impact-of-algorithms

[6]   The "Furman Report". https://www.gov.uk/government/publications/unlocking-digital-competition-report-of-the-digital-competition-expert-panel

[7]   Digital Markets Taskforce CMA Advice to HMG

[8]   https://www.gov.uk/government/news/a-joined-up-approach-to-digital-regulation

We particularly welcome the CMA policy of inviting interested parties and organisations to participate in the Algorithms Programme and we hope that JAAG will be able to make a useful contribution.

We also recognise the complexity of the problems, and the multiplicity of disciplines which need to be harnessed if we are to find straightforward, enduring solutions in a world where the speed of technological development, and an associated consolidation of power amongst those best positioned to benefit, outstrips the capacity for society to cope and governments to regulate.

The problems which JAAG is seeking to address will not be solved overnight and are likely to get worse before they get better, as AI and algorithms proliferate unregulated and unaudited.

Chapters 2 to 4 of this Response contain our comments and suggestions on the corresponding sections of the CMA Algorithms Paper. In each chapter, we address the questions which the CMA set out in the Consultation.

Each observation, suggestion or recommendation is allocated a unique "JAAG" number for reference purposes, followed as appropriate by the corresponding section/paragraph in the CMA Paper, followed by the Question number from the Consultation. Thus for example "[*JAAG#xx re Sect.2.1, Q3]*" would identify JAAG point *#xx,* addressing Question 3, with reference to Section 2.1 of the CMA Paper.

All occurrences of the text string *"Sect."* in this Response refer to a section of the CMA paper, and all occurrences of *"§"* refer to a paragraph of that paper.

The CMA Paper raises many deep-seated issues and it is difficult to say which of them should receive priority for attention. However, there are two issues on which we feel the need to focus. We present these in separate chapters.

Chapter 5 discusses the need for pro-active regulation.

Chapter 6 raises the issue of "In-the-loop" systems. We understand why CMA judges many kinds of such systems to be outside the scope of its concerns. We are certain, however, that CMA would not wish to exclude giving attention to harmful systems in the digital market just because their effects are partially achieved by the actions of people. We maintain that the CMA should take a keen interest in such systems, even though this introduces many difficult but important issues not present on simple computer-only systems.

Chapter 7 presents additional points in response to Question 8 of the Consultation.

Chapter 8 includes administrative information requested.

Finally, we have included four annexes which support and supplement content of the main chapters.[9]

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[9] Annex A contains a discussion of the word "Algorithm". which has become a catch-all buzzword appearing on news headlines and on the lips of politicians and commentators.

2. Theories of Harm

2.1 Identified harms

> Q1a. Are the potential harms set out in the review paper the right ones to focus on for our algorithms programme?

JAAG agree that the potential harms set out in the review paper all need serious and urgent attention.

[JAAG#1 re Sect.2, Q1a] The "Theories of Harm" are categorised more or less explicitly in the 27 pages of Sect.2 of the CMA Paper. JAAG believe that it would be helpful for the planning and management of future work to have a categorisation of types of harm in a much more concise form.

2.2 Other harms

> Q1b. Are there others that we have not covered that deserve attention?

[JAAG#2 re Sect.2, Q1b] JAAG note that the report makes several general references to "the vulnerable", but no explicit mention of children or other specific categories of vulnerability. We also note that the CMA in February 2019 published a report on Consumer vulnerability[10] though that too only makes mention of children with disabilities and only one very general reference to learning disability. We also notice that the last report produced on Children's online games goes back to 2015 by the OFT. We are concerned that users of algorithmic systems include a wide range of people with different vulnerabilities including children, the digitally illiterate, the learning disabled, and the disadvantaged. While such users may benefit from mitigation of the harms that affect all users, we suggest that they may be at greater risk of harm and perhaps different harms. One example is those that struggle with digital technology being exploited by default; there are significant sections of society that find it hard to navigate the technological world and could be taken advantage of. Examples affecting children include marketing techniques using algorithms having a negative impact on them even if they are not the primary target, and the effect of prolonged exposure to online advertisements prompted by algorithms.[11] We would draw attention to the work of the European Commission on the impact of online marketing on children's behaviour[12] and in particular the pertinent statement from it.[13]   We strongly recommend that CMA add as a high priority a specific plan to address harms to children and vulnerable adults of all categories.

[JAAG#3 re Sect.2, Q1b] There is also a case for giving specific attention to the needs of the digitally illiterate and others similarly limited. If we do not protect those that struggle with digital technology they will be exploited by default. There are significant sections of society that find it hard to navigate the technological world and could be taken advantage of.

[JAAG#4 re Sect.2, Q1b] The document appears not to include discussion of economic disenfranchisement of income due to demonetisation, false claims or the sudden loss of access to platforms in their entirety.

[JAAG#5 re Sect.2, Q1b] Nor is there discussion of the potentially coercive application of algorithmic technologies in monitoring individuals during employment.

[JAAG#6 re Sect.2, Q1b] The document naturally focusses on harms of algorithmic systems specific to markets and consumers, and not, for example claimants to benefits agencies. JAAG judge it would be helpful to have brief clarification of the types of algorithmic harms included or excluded from scope. JAAG recommend that the CMA keep abreast of types of algorithmic harms found in the future when

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[10] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/782542/CMA-Vulnerable_People_Accessible.pdf

[11] This is of special concern to JAAG; see Children harmed by algorithms

[12] https://ec.europa.eu/info/sites/info/files/online_marketing_to_children_factsheet_web_en__0.pdf

[13] "The study is relevant in particular because it confirms the need for a strong and harmonised protection of children as consumers, and it brings new evidence that advances the understanding of children as potentially vulnerable consumers and of marketing practices that can be considered unfair from the perspective of child consumers"

state and commercial actors replicate market-based algorithms in traditional non-market spheres of society. Experience shows, for example, that when the public sector outsources to the private sector, the latter hides behind the regulatory derogations claimed by the public sector, for example, DWP and GDPR compliance derogation.

[JAAG#7 re Sect.2, Q1b] JAAG observe that the pressure to drive down costs in a competitive market can cause serious harm by lowering ethical standards. By this we mean standards of social justice, ethics, privacy and other aspects of social good. The mechanism by which this harm affects consumers is that a competitor incurring the cost of high ethical standards may thereby suffer price disadvantage and be driven out of business; conversely competitors reducing costs by ignoring ethical standards may effectively monopolise the market through following lower ethical standards. The actual and potential harms to consumers include higher prices, coercive choice architecture, or poor product or service experience. This is likely to particularly affect vulnerable members of society. We suggest that this is a potential harm deserving significant urgent attention. More specifically, leaving commercial actors to self-regulate when there is little financial incentive to do so – or no substantive costs in not doing so - leads to a race to the bottom. CMA could investigate further and address how algorithms operate within, and may accelerate, such a race to the bottom.

2.3 Description of harms

Q2a. Do you agree with how we have described each harm?

In general JAAG agree with the way in which the harms have been described. In a few cases we have specific comments on some particular harms that we provide below.

[JAAG#8, Q2a] JAAG see an opportunity to improve the focus of work by refining the overall categorisation of harms in a more structured way. If such a categorisation were published as a briefer document or web pages, it would offer a point of reference for co-ordination of work with other bodies. A broader categorisation of harms could be attempted, with more detail given to those that are regarded as being in particular scope of CMA. It would be necessary to regularly and rigorously assess whether any of the harms 'fell down the gaps' between the various regulatory bodies in case any were not being addressed properly by any of them.

[JAAG#9 re Sect.2.2.2, Q2a] JAAG understands §2.71 as being the description or explanation of the category heading "2.2.2 *Manipulating platform algorithms and unintended exclusion*".   While we agree with this heading, and agree with the potential harms within the category described in §2.72 to §2.75, we suggest that the description is insufficiently clear. We would be happy to contribute to a discussion of this clarification but we are not able to propose specific revisions at this point.

[JAAG#10 re §2.91, Q2] JAAG note that §2.91 identifies potential harm from poor filtering by algorithmic systems lacking transparency. We suggest that poor filtering could also arise from inappropriate content in training data of ML algorithmic systems, which may be even less visible than rule-based systems. We therefore suggest that CMA emphasise the visibility, adequacy, and relevance of training data, as well as actual algorithms. See further information in Section 5.

2.4 Other examples

Q2b. Are there other examples that demonstrate them in addition to the examples we have included?

[JAAG#11 re §2.89, Q2b] JAAG note that §2.89 highlights the importance of regulators addressing lack of transparency. We see that a particularly important example of this is 'ethics washing', whereby powerful companies try to pretend that they are adequately addressing accountability, ethics, privacy, etc. whilst actually trying to minimise behind the scenes what they need to do in this regard.[14] For example, the number of ethical aspects considered within ethical frameworks supported by such companies can be by far the lowest in the frameworks available, rely on declaring general support for a few key values, rather than signing up for checking of a sufficiently comprehensive ethical approach and

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[14] https://www.theguardian.com/commentisfree/2021/mar/13/google-questions-about-artificial-intelligence-ethics-doesnt-want-answers-gebru-mitchell-parrots-language

criteria, etc.: Hagendorff[15] argues that some frameworks are intentionally not very comprehensive and serve as a smoke screen.

2.5 Impact of harms

> Q3. How likely and impactful are the identified harms now, and how might they evolve in the next few years?

JAAG see that all the identified harms have some current impact and all have potential to grow in the next few years unless constrained by firm regulatory action.

[JAAG#12 re Sect.2.1.1, Q3] Our experience in JAAG is that the personalised pricing harms identified in *Sect 2.1.1* are widespread among the most impactful now, and we expect them to be more of a problem in the next few years. Many of these harms seem increasingly unfair to citizens but also lead to the most vulnerable in society ending up with paying the highest premiums as they are less able to switch to a better deal for essential services.

[JAAG#*13* Q3] JAAG see that the accumulation of consumer data is giving companies an increasingly unfair advantage over consumers, and leading to more price exploitation. We suggest that it is a high priority to start closing the gap in consumer knowledge of their own data harvesting by compelling companies and all operators in the UK market, wherever they are based, to be more transparent. Failing to do this could result in harming vulnerable consumers such as compulsive shoppers.[16]

JAAG encourages systems that give individuals control of their data at all times. Amongst others, this view is also taken by Tim Berners-Lee, as described by him in relation to his Solid project.[17] This is the basis of the Solid project, which now has spawned a new startup called Inrupt. It all works on the basis of users controlling their data in online storage spaces called Personal Online Data Stores, or Pods. ("That's in the cloud –or, if you're really geeky, you have it at home, sitting in a physical box.") An increasing range of newly built apps are being designed to work with this new model: instead of surrendering their data to be indiscriminately used by big platforms, Solid users will judiciously allow everything from social media sites to shopping services to access their personal information on a case-by-case basis.

2.6 Examples to investigate

> Q4. Are there specific examples that we should investigate further to consider whether they are particularly harmful and potentially breaching consumer or competition law?

[JAAG#*14* Q4] Examples of troublesome incidents that merit swift investigation include:

(a) *YouTube*: demonetisation of content without any clear justification why, or transparency as to what precise infraction occurred, with decisions apparently being made based upon banned keywords.[18]

(b) *YouTube*: allowing bad faith copyright claimants to seize advertising revenue.[19]

(c) *Amazon*: permitting counterfeit products to be sold by third-party vendors, with no clear way for customers to alert Amazon as to bad faith sellers on their platform, and only taking action within a single jurisdiction, not across the platform.[20]

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[15] Hagendorff, T., 2020. The Ethics of AI Ethics: An Evaluation of Guidelines. In Minds and Machines, Vol. 30, No 1, pp. 99-120.

[16] https://www.theguardian.com/technology/2018/sep/08/joseph-stiglitz-on-artificial-intelligence-were-going-towards-a-more-divided-society

[17] https://www.theguardian.com/lifeandstyle/2021/mar/15/tim-berners-lee-we-need-social-networks-where-bad-things-happen-less

[18] https://www.insider.com/youtubers-identify-title-words-that-get-videos-demonetized-experiment-2019-10

[19] https://www.eff.org/wp/unfiltered-how-youtubes-content-id-discourages-fair-use-and-dictates-what-we-see-online

[20] https://archive.is/hyLEy

(d) *Amazon*: using its insider knowledge of third party vendor profits and margins to create cloned own-brand products.[21]

(e) *Pontins, UK Construction Sector*: blacklisting of certain keywords or names from receiving customer service or employment.[22]

(f) *YouTube, Netflix*: no longer providing service to older devices, despite them being perfectly capable of functioning, because the OS version is 'too old', thereby disadvantaging the poor and second hand trade as perfectly functional devices are artificially made unviable.[23]

3. Techniques to investigate the harms

3.1 Other techniques

Q5. Are there any examples of techniques that we should be aware of or that we should consider beyond those that we've outlined?

[JAAG#15 re §3.10, Q5] JAAG note the ex-ante (pre-deployment) techniques named in §3.10. We are aware of others used to test and validate systems, to show the presence or absence of important biases.[24]

[JAAG#16 re Sect.3.1 & Sect.3.2, Q5] JAAG note the distinction made by Sect.3.1 and Sect.3.2 between having or not having direct access to firms' data and algorithms. We consider that the productivity of investigations may be very different between the two and recommend investigation of this with a view to setting priorities between them.

[JAAG#17 re §3.14, Q5] JAAG note the statement in §3.14, of the importance of understanding "the context for the development and deployment of the algorithm", including as an example Key Performance Indicators (KPIs). We see benefit for assessors of grasping the commercial intent that gives rise to the commissioning and design of a given system. Therefore we suggest that pre-emptive powers are sought to explicitly include access to the full range of relevant documentation of a development project (see more material on this in Section 5, Proactive Regulation). Where documentation is weak or non-existent, an ethical audit could then be mandated as a standard part of any development process. We further suggest that these powers be backed up with a CMA guidance code, setting out the minimum acceptable scope and standards for system stewardship. It is our experience that risk analysis of these systems will lead to the need for a hierarchy of levels of risk management and therefore, increasingly rigorous guidance. This guidance code should cross-refer to other relevant government policy, in real time.

[JAAG#18 re §3.13, Q5] JAAG note the discussion in §3.13 the different approaches of "dynamic analysis", "static analysis" and manual "code review". We recommend considering judicious combination of these. For example, where "dynamic analysis" finds questionable ethical decisions, "code review" could focus on this particular aspect of that part of the system. This should find its place in a structured standard for these systems. See Section 5.3 for further details.

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[21] https://www.wsj.com/articles/amazon-scooped-up-data-from-its-own-sellers-to-launch-competing-products-11587650015

[22] https://news.sky.com/story/pontins-used-undesirable-guests-list-to-discriminate-against-gypsies-and-travellers-12233656

[23] https://appletoolbox.com/what-to-do-if-netflix-is-not-compatible-with-your-ipad/

[24] In particular these include: Breaking set; cause and effect fishbone analysis; Failure Mode and Effect Analysis; morphological forced connections ; why – how charting; and six thinking hats.

3.2 Other cases

> Q6. Are there other examples where competition or consumer agencies have interrogated algorithms that we have not included?

[JAAG#19 re §3.19, Q6] JAAG note that §3.19 suggests that an algorithmic audit as outlined in *Sect.*3.2 will be more effective than one limited to *Sect.*3.1, but acknowledges that conducting such an audit depends on incentives (relevant legislation, soft power) for companies to engage, in addition to effective formal powers. JAAG recommends that, where appropriate, penalties should be severe enough to oblige active collaboration and evidence provision. The regulator also needs to be sufficiently resourced to ensure that the threat of detection of non-compliance is too high for firms to take the risk. We note the success of schemes such as the Environment Agency's "Monitor Operations Audit" (MOA), which is a judicious combination of carrot and stick – fewer inspections if better techniques and certified equipment are used.

4. The role of regulators in addressing these harms

4.1 Envisaged role

> Q7. Is the role of regulators in addressing the harms we set out in the paper feasible, effective and proportionate?

JAAG note the discussion in *Sect.*4 of the CMA paper and the analysis of the role of regulation under the headings *Sect.*4.1 to *Sect.*4.4. We judge that the 4 categories of guidance and standards, existing harms, algorithmic monitoring, and capabilities and collaboration are appropriate. However, there are both explicit and implicit aspects of what is discussed that we suggest should have further emphasis and attention.

[JAAG#20 re Sect.4, Q7] Many of the regulatory activities imply much highly skilled staff time in the DMU, for investigating, auditing, analysing algorithms, and for checking data; in the light of which, §4.26 mentions "specialised firms to provide algorithmic auditing services to prove certification against these standards". We suggest that CMA seek strategies and policies for maximising the effectiveness of such auditing and certification by ensuring that the costs are supported by the businesses in the respective markets. At the same time, we consider that it will be important that the "buy-in" of the businesses is not compromised.

We also suggest that the development of open-source technologies to affordably audit algorithmic processes should be encouraged, perhaps through competitions and bounties.

Moreover, systems are not deployed in isolation from the organisations behind them. The ethical integrity of such organisations must also be upheld if safety and assurance is to remain meaningful. This should be similarly vetted and certified where feasible.

[JAAG#21 re §4.21, Q7] JAAG note that in §4.21(a) CMA suggests: "We may order firms to disclose information about their algorithmic systems to consumers". We recommend that this be done in a way that consumers can understand –if a system is certified then its "badge" will tell the consumer that the necessary disclosures have been made. Please also see our related comment under Q8 below.

4.2 Other approaches

> Q8. Are there other ideas or approaches that we should consider as part of our role?

[JAAG#22 re Q8] We note that digital platforms are often heard to claim to be mere intermediaries and therefore not responsible for what people say on them. We strongly believe that a platform which (e.g.) allows pornographic or hate material to be disseminated must either take responsibility for the content, or be prepared to provide evidence-backed identities of the originators of such content. We suggest

further that, even before such a principle is built into legislation, CMA should seek to have it accepted in its regulation of these platforms.

[JAAG#23 re Sect.4, Q8] Web sites nowadays ask users to agree to and accept their "cookies policy". Those policies are usually long, complicated, and difficult to understand, and they too often demand intrusive licence, potentially infringing the CMA Prohibition in the 1988 Competition Act at 2(2)(e). They are typically positioned as unwelcome distractions from what the user is trying to do. People rarely read the associated policies. We consider it highly desirable that CMA

    (a) Seek to regulate the content and manner of presentation of cookie policies

    (b) Promote the development of standard forms and styles of cookie policy to which users can give blanket assent.

[JAAG#24 re Sect.2, Q8] Transparency is key: if we shine a light on practices then they are less likely to be unethical. The Uber example of charging more if the user's battery was low would probably have created a backlash if customers were aware that that was happening and the company may not have implemented it if they thought that they would have to disclose this. With reference to the harms raised in *Sect.*2 about lack of transparency, of course transparency about what algorithms do can make a difference, and one way of addressing this is to make information available to the public. A great example is that the city of Amsterdam has started a register of artificial intelligence systems and algorithms used by the city authorities that can be inspected by the public. This demonstrates their ethical and social justice credentials. One of these, for example, calculates the probability of an illegal holiday rental situation, triggered by a report of possible fraud.[25] Our suggestion is that we might have a national register like this for firms of certain size or sales volume.

Related also to transparency, a non technical walk-through of how decisions are made should be published. There might be push back as companies might argue that the decision-making is proprietary. Therefore, independent audit could in some cases be a better way to proceed, as the commercially sensitive elements which do not need to be shared publicly by the algorithm could be verified against a set of standards.

[JAAG#*25* re Q8] We believe that CMA should explicitly recognise that ultimately one or more human being(s) or other legal entities must take responsibility for harms caused and should be accountable for such responsibility. CMA should take appropriate account of that fact in its examination and regulation of digital markets.

5. Proactive regulation

We make this simple point the subject of a separate chapter because we regard it as too important and too pervasive to risk being lost amongst much other detail.

We know that CMA is aware of all this, as mentioned in CMA's Executive Summary, but we believe it merits higher priority than it appears to be given.

5.1 Proactive regulation

[JAAG#26 re Sect.2.1, Q8] Most of the harms and solutions identified in *Sect.*2 are related to products and services which have been put on the market. The solutions only apply after the harms (including collateral damages) have occurred. We hope that the CMA programme will also consider solutions before products and service are put on the market to avoid harming vulnerable consumers.

Providing examples of harms in *Sect.*2 has been useful in demonstrating the current situation, and we think it would be beneficial if the DMU were to adopt the 'ex-ante' (pre-deployment) regime as mentioned in CMA's Executive Summary. In essence, we propose a *proactive approach* - that is, to consider solutions before products and services are put on the market in order to avoid harming vulnerable consumers.

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[25] https://algoritmeregister.amsterdam.nl/en/

One of the key problems of the digital era is that innovation outpaces regulation, with regulation playing a 'catch-up' role. This also applies to digital markets, perhaps more so as changes happen quickly. What systems actually do, and what harmful effects they have, are very much more difficult to discern, even by those responsible for them, let alone any outside agency. Taking into account the instantaneous global reach of such systems, the harms they cause are likely to be more severe, and more pervasive. Addressing the problems one at a time, even if undertaken with haste, will not stop them happening time and again.

We note CMA reference to guidelines and standards (*Sect*.4.12) and recognise the benefits using these can bring, but it could also be the case that a 'pre-assessment' of a company preparing for a digital market could pre-empt potential difficulties (such as applications for planning permission before building a house).

5.2 Why proactive regulation

In 1942, Joseph Schumpeter formalised his "creative destruction" theory. [26] He explained how innovation is causing destruction of old practices while creating new ones. We are witnessing this theory in action when digital firms enter a market, creating new sets of rules for existing players in the marketplace to adapt or disappear.

What perhaps Schumpeter did not anticipate is the velocity of change brought by the digital companies, which is not giving time for consumers and other actors of the market to make sense of the potential harm they are facing.

Uber and Airbnb are rightfully considered disrupters of their markets as they change them so radically, often leaving consumers, competitors and regulators out of their depth.

This rapid change does not leave time for legislators to identify harm and respond accordingly, thus leaving them far behind very rapidly growing technological companies. This should be identified as a potential risk for fair competition and democracy more generally when we are unable to sensibly anticipate and respond to the nature and force of social disruption.

One example of law catching up with the digital companies was observed recently when, after years of injustice, the UK supreme court gave workers' rights to Uber drivers.[27]

However it seems that digital companies do not realise themselves the full impact of their reach. When Uber and Lyft are asked whether or not their 'dynamic pricing' algorithms create racial discrimination[28], they respond by saying that they welcome outside help in figuring out the potential dangers. We are asking here if the risk assessment not only of the algorithms but also the entire software life-cycle and tools should be part of pre-launch analysis and eventual certification of products.

We consider that it should be the duty of the CMA to search for proactive measures to help companies and consumers avoid dangerous practices (and algorithms) and thus protect vulnerable consumers.

An aspect of pro-active regulation is that regulatory standards should keep abreast of technological developments, and as markets evolve. In order that regulatory standards can be kept up to date, it should be possible to add new sector standards based on insight from experience. This approach has been shown to work in the environmental domain. What we seek to avoid is the sclerotic approach of setting international standards which can take years. Flexibility and responsiveness to the market are necessary qualities.

[26] https://www.researchgate.net/publication/
225606585_Schumpeter_and_new_technology_based_firms_Towards_a_framework_for_how_NTBFs_cause
_creative_destruction
[27] https://www.theguardian.com/technology/2021/feb/19/uber-drivers-workers-uk-supreme-court-rules-rights
[28] https://venturebeat.com/2020/06/12/researchers-find-racial-discrimination-in-dynamic-pricing-algorithms-
used-by-uber-lyft-and-others/

5.3 Standards

[JAAG#*27* re Sect.4, Q8] A code of conduct will help those companies that want to be more ethical and open but do not know the best way to do it. To deal with bad actors, powers to initiate investigations against the code, by third parties and the CMA, should give some protection. JAAG would welcome a standards-based approach to the regulation of digital markets.

Harms can arise from a wide variety of sources. Here, for example, we classify them into layers. Each layer would be part of a standard against which the system, its developers, and suppliers would be audited and certified.

Layer	Threat	Countermeasure
1	1.1 Software defects, malware, configuration control failures (use of wrong versions), etc.	Software life cycle standard certified via independent audit protocol applied throughout its lifetime. The standard would require different levels of rigour as a function of the levels of safety and security required.
	1.2 Lack of competence in staff: All those involved in the conception, development, and maintenance of the system throughout its life cycle need to be be of the required competence.	Each entity will maintain a competence register that will be one of the items of evidence that will be continually audited by the certifying body. All staff involved in the project shall be identified in the system compliance plan (SCP), a living document, analogous to a safety plan, which identifies al the resources, measures, techniques, and staff required to develop and maintain the system so that it always complies with the standards.
2	Loss of database integrity, tampering, etc.	Certified data integrity standard, including audit trails and/or live audit bots.
3	Defective model ethics	Ethical analysis and audit against an ethical framework and sector specific ethical standards
4	Defective model training	Model Validation and Verification –including independent testing with a scenario generator which can be reconfigured to match changes in usage profiles during the life of the system
5	Inadequate understanding and framing of the requirements of the application's stakeholders	Certified sector standard which defines the harms that are to be prevented and avoided. There would be several sector standards – 5.1, 5.2, etc. according to the range of applications being developed.

An audit against such a standard would make use of evidence supplied by the developers who would thereby build a compliance case –a structured argument that shows that the system complies with the standard. Accompanying this compliance case would be an assurance case that demonstrates that the evidence is sufficient and sound. These two documents would provide evidence and references that support the issue of a certificate by the certifying body.

At the present time, certifying bodies are regulated in a lax way. It is our experience that this has led to negligent and even fraudulent safety certificates being issued. In the light of the findings of the Grenfell inquiry, and our own experience in discovering and exposing falsely certified safety equipment, it is necessary to have much stricter regulation of certifying bodies. To this end we recommend that any standards developed for these systems should be certified only by certifying bodies who themselves are certified by UKAS (The UK Accreditation Service) as being competent and fit persons to conduct audits against the proposed standard.

6. In the loop

[JAAG#28 re §2.37, Q2a] CMA stipulates in §2.37 that a specific *"in-the-loop decision making paradigm is not in scope for further consideration here"*. We interpret that to clearly exclude decision-making systems that are essentially people-driven, however much assisted by use of computers. -We do not believe that CMA would wish to exclude from consideration computer-driven systems within which some actions are performed by humans. We consider that, if our interpretation is correct, the CMA could usefully make the distinction clearer. [29]

In Sect.1.1 CMA states that "we use a broad interpretation of the term 'algorithmic system', as a convenient shorthand to refer more widely to automated systems, a larger intersection of the algorithm, data, models, processes, objectives, and how people interact and use these systems". In compliance with this, JAAG uses the word "algorithm" to mean the overall set of rules and methods by which any system has its effects. As such it encompasses both those components executed by computers and those performed by people.

With its function of both market regulation and consumer protection, CMA's DMU would naturally be concerned with all automated systems which have potentially harmful effects on individuals ("users" or "customers") or on society as a whole. And that applies whether or not humans perform some of the actions within those systems.

It could be argued that it should be of little concern by what agency an algorithm achieves its effects. However, it seems clear that having humans in-the-loop, including moderators, will in fact deeply affect numerous significant factors relating to the investigation and regulation of digital markets. It affects, for example
- what a system actually does or can do, which is differently limited or enabled
- how quickly it does it (people's actions are at best people-paced, whereas computers work at what used to be claimed as "the speed of light". This can make a very big difference to users)
- how reliably it does it (computers follow given rules consistently; people overlook things, do different things on different days, and employ unstated -and often unconscious- prejudices)
- responsibility and accountability (of those tasked to interpret and follow the rules, those who make the rules and monitor adherence to them, those responsible for ensuring that staff are competent: appropriately qualified, instructed, motivated and supervised)

[JAAG#29 re Q5] We note that, if a system is to be investigated, the questions which need to be asked about the role of people in its operation are quite different from questions about the computer software. This does not seem to be recognised in the CMA document. We suggest that there is a whole new range of requirements which CMA needs to address. See Annex D for a*n illustrative starter for an audit checklist which JAAG proposes to develop further for its own purposes.*

[JAAG#30 re Q8] It seems likely that, if CMA is to seek to regulate systems in whose operation humans play a significant part, it will need additional powers to obtain pertinent information about those people.

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[29] We note that the CMA cites work by Green and Chen, who appear to have originated the term "in-the-loop" in this context, but the phrase itself has been around for much longer. We have provided a sourced definition in our Glossary (Annex C). Green and Chen themselves have emphasised that "A key aspect of future work will be to study algorithm- in-the-loop decision making in real-world rather than experimental contexts. Mechanical Turk experiments are no substitute for in situ evaluations" (https://webcache.googleusercontent.com/search?q=cache:Oid8SWTE5soJ:https://aaai.org/ojs/index.php/AAAI/article/view/7115/6969+&cd=1&hl=en&ct=clnk&gl=uk&client=safari).

7. Additional points

This chapter presents very briefly some additional points which we consider will bear on the Digital Markets Unit in the coming months and years. As such we regard them as responses to Question 8.

> Q8. Are there other ideas or approaches that we should consider as part of our role?

7.1 The role of experts

The CMA has rightly recognised the complexity of the problems created by the rapid introduction of AI and algorithm-based systems, and its efforts to build alliances with interested parties are very welcome. There is great emphasis on the need to involve "Experts" and rightly so.   However, in tackling the problems, we need experts across a wide range of disciplines, not just the technology: Ethics, Law, Psychology, Economics, Business Management to name but a few. And we also need to engage with the general population through teaching, involvement, and better and more truthful communication.[30]

A problem which commonly arises through neglect of this point is that quite senior and experienced managers in both the public and private sector have a tendency to be in awe of technical experts, especially those who can speak confidently and fluently, but use jargon as a smoke screen for the fact that there are aspects of both the technology, and the environment in which it is being used, which even they don't understand.   JAAG intends to be at the front of efforts for problems and proposed solutions to be described in plain English, but we recognise that much jargon is needed for when technical experts are talking to each other.

Our "responsible owners", leaders and managers cannot abdicate to technicians their responsibility for the effects on the decisions taken by systems which use AI and algorithms.

7.2 Choice architecture

[JAAG#31] Nudge Techniques were widely acclaimed when Thaler and Sunstein's book was first published in 2008.[31]   It was seen to have many advantages for the implementation of public policy, whereby people could be nudged into preferred behaviour while having the option and freedom to choose otherwise. But like other techniques for influencing people, it can be used for harm as well as for good. The ideas themselves have been around for much longer, for example the strategic placing of consumer goods in supermarkets.   But in the online world, the techniques are now being adopted in such abundance that it is arguably often harmful to consumers, contrary to Fair Trading, and anti-competitive. Even consumers with the knowledge and understanding of the technology will go for a quick and easy option if the alternative is to find themselves clicking down rabbit-holes of web pages. Examples include the acceptance of Privacy and Cookie policies, and terms and conditions.

7.3 A perfect storm

[JAAG#32] In our response to the CMA's Consultation on its Annual Plan, we supported the planned focus on the economic effects of Brexit and Covid, but we also welcomed the fact that harms from algorithms are receiving attention. The combination of these three is creating a perfect storm.   A challenge (and opportunity) for the CMA is to emphasise the need for international action on many of the issues raised. It will mean close collaboration with the CMA's counterparts in both Europe and the US. Perhaps an unintended consequence of Brexit could be that the CMA might play a pivotal role in bringing about better co-operation among countries in the Atlantic Alliance, and perhaps the rest of the globe.

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[30] The Taiwanese governments success in using Polis (https://pol.is/home) over the last 7 years in consulting with its population in policy formation shows what is possible.

[31] *Nudge: Improving Decisions about Health, Wealth, and Happiness,* written by University of Chicago economist Richard H. Thaler and Harvard Law School Professor Cass R. Sunstein, 2008.

7.4 Search engines

[JAAG#33] Much Web searching was done before Google existed. But Google was built on, and was the first to exploit, the (retrospectively obvious) insight that Web searches would be very much faster if based on pre-compiled indexes, and that there were a variety of ways a great deal of money could be made by offering such a service free of charge. These include

    (a) appending paid-for advertisements to search results (arguably no more harmful than having commercial television)

    (b) taking payments to have nominated products and suppliers at the top of lists of hits (a dubious practice which could be deemed to unfairly and dishonestly distort the results of searches), and

    (c) selling to prospective suppliers details of enquirers who look like prospective customers (an offensive and intrusive practice which arguably merits closer regulation as a minimum).

8. Contact and future collaboration

We are Just Algorithms Action Group, usually abbreviated to JAAG. JAAG is a not-for-profit membership organisation, founded in 2019 by members from a Quaker background and arising from a concern about algorithmic, artificial intelligence (AI), automated decision making (ADM) systems and their real world use.

To date, JAAG has received no commercial sponsorship. Our work has been resourced mainly through voluntary effort from our members. Funding has come from members' subscriptions and donations, and a number of small grants from trust funds. We have projects planned for which we expect to make grant applications.

As such we do not represent any specific consumer or business interests, and seek only to promote the fair and just operation of computer-based systems and the avoidance or mitigation of the deep harms they can sometimes cause to individuals and to society as a whole.

JAAG does not seek a mass membership like some popular action groups, but a skilled and informed membership who can comment on, and help towards achieving, longer term goals. Having said that, we have members who simply support our aims without wishing to get involved personally. We welcome membership applications from anyone who shares our aims and values.

Further details are provided in Annex B and on our website at jaag.org.uk

Our follow-up contact is John White, email john.white@jaag.info.

We shall be happy for you to follow up this Response and to discuss further the thoughts it offers.

We do not consider any of the content of this Response to be confidential and we do not seek to retain intellectual property rights over any of it. All of the contributors have worked in a voluntary capacity. We are content for it to be copied at will without attribution, even for potential commercial gain.

We are very interested in collaborating with the CMA in its Algorithms Programme. Twelve of our members contributed to the production of this Response. Many of the thoughts and suggestions we received have not been included in this document, but are stored in the Cloud awaiting further research and analysis to be carried out.

Annex A. What is an algorithm?

"Algorithm" has become a catch-all buzzword appearing on news headlines and on the lips of politicians and commentators. At JAAG we have come to terms with the fact that the word is used with different meanings in different contexts, sometimes making no sense at all. It is a convenient word for blurring responsibility and for shifting blame and accountability for bad things. Which is why we attempt to provide further clarification about the term in this annex.

The word "algorithm" used to be a mathematical term for a method of performing a calculation, as distinct from a specific, detailed procedure or mechanism which embodies or implements that algorithm. For example, the venerable "sieve of Eratosthenes" is an algorithm for producing a list of prime numbers. That algorithm may be followed on paper or embodied, in a variety of ways, in computer programs in a variety of different languages.

In computing the term, where it was used, came to mean the method adopted to satisfy a specified requirement as distinct from and prior to the implementation of software, for a given machine in a given language, which operated in accordance with that method.[32]

The word is now used much more widely, but has not settled on a clear, universally accepted definition.

JAAG takes the view that an algorithm is an algorithm even if it is partly implemented by people. JAAG thus uses the word to mean the overall set of rules and methods by which any system has its effects. As such it encompasses both those components executed by computers and those performed by people: it is the result that counts, not who does it.

At JAAG, our concern is primarily where harm is done to individuals due to the malign effects of computer based systems. And modern software (using AI, ML, etc.), whose algorithms are often covert, sometimes unknown even by those responsible for them, and whose malign effects are often commercially or politically motivated but also often carelessly unintended, greatly increases the potential for harm, whether or not there is human intervention.

CMA offers essentially the same outlook as JAAG:

> §1.1 Algorithms are sequences of instructions to perform a computation or solve a problem. We use the term 'algorithm' to include simpler sets of rules as well as more advanced machine learning or artificial intelligence (AI) code. In this paper, we use a broad interpretation of the term 'algorithmic system', as a convenient shorthand to refer more widely to automated systems, a larger intersection of the algorithm, data, models, processes, objectives, and how people interact and use these systems.

However CMA seems in practice to give even less attention to the people components of systems than does JAAG.

Moreover, being concerned explicitly with fair competition between suppliers and protection of consumers, CMA has to give attention to systems which deliver commercial services. Within that, the perceived need, with which JAAG deeply sympathises, is apparently to concentrate primarily on those aspects of the computer components of such systems which go beyond the simple delivery of the service and seek by various means to limit competition and to disadvantage consumers. And it is that kind of algorithm which the CMA Algorithms paper and this response address.

There is a growing public awareness of the undesirable effects of what is in effect a class of voluntarily introduced malware.

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[32] Note, however, that such an algorithm is not in fact always needed. Sometimes there is so close a correspondence between what a computer is required to do and the software which does it that the need for an intermediate stage is at best theoretical.

Annex B. Just Algorithms Action Group (JAAG)

Just Algorithms Action Group (JAAG) is a not-for-profit membership organisation, founded by members from a Quaker background and arising from a concern about algorithmic, artificial intelligence (AI), automated decision making (ADM) systems and their real world use. We are interested in the impact these systems have on human beings. For example, are they safe/unsafe or beneficial/harmful?

JAAG was established in 2019 in response to concerns about the adverse impact of welfare system reforms on the most vulnerable in society. The founding members are professionals with a blend of experience in the investigation of injustices, management and decision-making, mission- and safety-critical software, software standards and auditing. The root concern arose from contact with homeless people and the role of the Universal Credit system (UC) in their misfortune.

Social welfare is just one example of where algorithmic decision making systems are used. We see our work going into other areas such as criminal justice.

Our principles and working methods are rooted in Quaker values, but we are attracting and recruiting members from all faiths and none, computer scientists, project managers, lawyers, teachers, engineers, ethicists, public servants and members of the caring professions: anyone who is concerned with the risks that the world is stumbling towards dystopia, without due regard to basic human dignities and rights.

JAAG draws on professional experience from the following areas:
- Decision-making, decision-taking and decision stewardship; governance, corporate design, management culture and practice, leadership development
- Many years' developing, consulting on, and auditing information technology (IT)-based systems
- Creation of multi-layered threat-based technical standards for mission-critical software systems; development, integration and use of mission-critical systems
- Auditing and certification of mission- and safety-critical systems and their lifecycles
- Development of advanced user-centred computer systems, with focus on human computer interface issues and IT users' needs for standards
- Many years commercial experience applying AI approaches including genetic algorithms, Bayesian nets, fuzzy and neuro fuzzy logic

We are establishing links with other bodies active in this area: professional institutes, academic departments, legal firms, government and non-government organisations, regulators and media groups.

Our principal objective is to bring together and build an influential group, to promote practical solutions to the complex problems we face.

Annex C. Glossary

Some of the terms and abbreviations used in this document

"Sect." refers to a section id of the CMA Paper, "§" refers to a paragraph id.

A/B testing	A technique whereby two versions of a system are operated simultaneously, typically to assess the effect of envisaged changes. (See *CMA §2.60)*
ADM	Automated Decision Making
AI	Artificial Intelligence, a term used in computing to mean machine intelligence, or the development of computers to carry out tasks which would indicate intelligence in humans
algorithm	Originally a technical term in computation. Now more widely used and less precisely defined. In this document, deemed to encompass any system of procedures and rules followed by people as well as computers for a given purpose. (See also Annex A and CMA §1.1)
API	*§3.8* note 139: "An application programming interface (API) is a computing interface that allows data to easily be sent back and forth between systems (including inputs and outputs to an algorithmic system)."
Choice Architecture	A method to retain consumer sovereignty (the right to choose) but nudging consumers to make certain choices
CMA	The Competition and Markets Authority, an agency of HMG whose mission is "to make markets work well for consumers, business, and the economy" *(§1.7)*.
cookie	An HTTP cookie is a small packet of information stored by a Web browser on behalf of a website to facilitate future interaction, typically with pertinent details of the user.
crawling	*§3.7:* "Crawling and scraping are methods that allow data to be extracted from websites."
DaTA	The Data, Technology and Analytics Unit of the CMA
DMU	Digital Markets Unit, a (proposed) section within the CMA whose function is "to implement a pro-competitive regime for digital markets" *(§1.8)*.
EHRC	Equalities and Human Rights Commission
ESG	Environment, Social and Governance (measures)
HMG	Her Majesty's government, the government of the UK
ICO	Information Commissioner's office, a UK NGO responsible for upholding information rights.
in the loop	Ben Green, Yiling Chen, Harvard University: "The algorithm-in-the- loop framework centers human decision making, providing a more precise lens for studying the social impacts of algorithmic decision making aids."[33] (But see Chap.5)
JAAG	Just Algorithms Action Group
ML	Machine Learning, a subset of AI and the process whereby a computer system uses algorithms that improve automatically through experience.
NGO	Non-governmental organisation

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[33] Green, B. and Chen, Y. (2019). "The Principles and Limits of Algorithm-in-the-Loop Decision Making". In *Proc. Hum. Comp. Interaction*, 3, CSCW, Article 50.

Ofcom	Office of Communications, a UK NGO responsible for regulation of communications.
predation	*§2.77,* note 98: "Predation refers to situations where an incumbent firm with a dominant position sets prices very aggressively with the aim of excluding a rival from the market. If successful, the predator will be able to recoup its losses by raising prices and earning higher profits because the prey is longer in the market. Predation is controversial because it is difficult to distinguish low prices due to tough but fair competition from low prices that are part of an exclusionary strategy by a dominant incumbent."
sandbox	*§4.25,* note 181: "A regulatory sandbox is a programme run over a set number of months, in which firms can test their products with real customers in a controlled environment under the regulator's supervision and feedback, whilst not being subject to the usual rules that apply to regulated firms. A key aim is to assess the viability of innovations in terms of their compliance with regulatory requirements."
scraping	See crawling
STEM	STEM is a common abbreviation for four closely connected areas of study: science, technology, engineering and mathematics

Annex D: "In the loop" – an initial exploration of considerations

This is not proposed as a definitive audit checklist. It is just an illustrative starter which JAAG proposes to develop further for its own purposes

1. What is done?

(a) Humans are in the loop watching every decision, all the time eg TikTok child porn moderators
(b) Human is in the loop watching some decisions, some of the time
(c) Human is in the loop sampling decisions made, in real time
(d) Human is in the loop sampling decisions made, in arrears
(e) Human comes into the loop if there is an appeal, eg UC
(f) Other 1
(g) Other 2

2. What authority does the human in the loop have?

(a) Reverse one decision
(b) Reverse many /all decisions
(c) Change or fix system decision-making protocol
(d) Change or fix system code or algorithm
(e) Provide compensation
(f) Recommend compensation
(g) Escalate a concern to authorities with adequate power to remedy the situation

3. What certification or training does the human have?

(a) Is their training up to date
(b) Are they trained to work on this system eg bias alertness
(c) Is there adequate supervision in place?

4. Fairly traded? (Corporate responsibility)

(a) Are there verifiable safeguards to validate the suitability of the human customer in this loop? e.g. under-age children playing online games
(b) Choice architecture: are nudges being used to rush or coerce customer choices in the decision-making process

5. Best practice?

(a) Does choice architecture uphold the spirit of equality law?
(b) Has the precautionary principle been adequately used in system design
(c) . . .