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ABSTRACT:

Over recent years, the EU has increasingly looked at the regulation of various forms of automation and the use of algorithms. For recommender systems specifically, two recent legislative proposals by the European Commission, the Digital Services Act from December 2020 and the Artificial Intelligence Act from April 2021, are of interest. This article analyses the recent legislative proposals with a view to identify the regulatory trajectory. Whereas the instruments differ in scope, it argues that both may –directly and indirectly– regulate various aspects of recommender systems and thereby influence the debate on how to ensure responsible, not opaque, machines that recommend different kinds of information to humans.

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Recommender Systems in the EU: from Responsibility to Regulation

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1. INTRODUCTION

Over recent years, the European lawmaker has increasingly looked at the regulation of various forms of automation and the use of algorithms, for example in relation to algorithmic content moderation on the Internet (Riis & Schwemer, 2019). This discourse on content moderation focuses primarily on the disabling of (illegal) information (Grimmelmann, 2015; Riis & Schwemer, 2019; Gorwa et al., 2020)¹ and the underlying balancing of fundamental rights, most prominently freedom of expression and information.

Somewhat related to this –but different from the discourse on content moderation– is the use of automated systems, which are not used to disable but instead to (query-less)² recommend content. These algorithmic systems are used for the selection and prioritisation of information by a large variety of intermediaries such as search engines, social media or streaming platforms and facilitate users' discovery (personalised item suggestion) in an overwhelming sea of information.³ Technically, recommender systems 'follow a variety of criteria and designs, sometimes personalised for the users, based on their navigation history, profiles, etc., other times based purely on the content analogy or ratings.⁴

Today, these systems recommend news⁵, products or entertainment content to just name a few. Spotify's personalised 'Discover weekly' playlist has resulted in a staggering 16 billion streams since its release in 2016.⁶ Already in 2015, Netflix, which goes as far as customising thumbnails⁷, claimed that their recommender system⁸ influences the choice for about 80 percent of hours streamed (Gomez-Uribe & Hunt, 2016). YouTube, in 2018, announced that 70 percent of the time watched on its platform based on its recommender system. These automated systems, in any case, play a crucial role in how humans consume information online. In a way, they have augmented or replaced the 'natural social process' (Resnick & Varian, 1997) of word of mouth or other 'manual' recommendations like the mixtape of your friend.

Recommender systems, however, also have raised various concerns related to e.g. privacy (see already Resnick & Varian, 1997), filter bubbles and the amplification of confirmation bias (Pariser, 2011) or potential negative consequences for diversity and the quality of public discourse (Helberger et al., 2018). Concerns become even more visible when harmful or illegal content is recommended, e.g. extremist content (Alfano et al., 2020; Whittaker et al., 2021). Recently, for example, Instagram's algorithm and its effects on teen mental issues became subject of widespread public attention.⁹

Recommender systems are at the very core of many online platforms' business models¹⁰ (and potentially constitute trade secrets). Despite data and computer science research communities being involved in some of these developments¹¹ and certain transparency efforts by platforms like YouTube¹² as well as civil society projects to improve knowledge about recommender systems¹³, the opaqueness of these systems and their effects are criticised (e.g., Council of Europe, 2019).

Against this backdrop, this article analyses two recent legislative proposals with a view to identify the regulatory trajectory for

recommender systems in the EU as well as pinpoint potential shortcomings of the suggested routes.

On 15 December 2020, the European Commission presented its highly anticipated proposal for a Regulation termed the Digital Services Act (DSA)¹⁴. The proposed Regulation firstly aims at updating the current liability exemption regime (safe harbours) of the eCommerce Directive, which for the last two decades represented the cornerstone of how intermediaries deal with (illegal) information online.¹⁵ Secondly, the DSA would also introduce certain asymmetric due diligence obligations for online intermediaries. Notably, the instrument puts forward the first legal definition of recommender systems in the EU. Importantly that is not to say that recommender systems today operate in a regulatory void.

Just half a year later, on 21 April 2021, the European Commission also presented its proposal for the Artificial Intelligence Act (AIA)¹⁷ in a parallel trajectory, which looks specifically at the regulation of 'artificial intelligence systems'. The AIA proposal, too, may become relevant when discussing fairness, accountability and transparency of (certain) recommender systems.

1 Compare also the proposed definition of content moderation in art.2(p) DSA, as 'the activities undertaken by providers of intermediary services aimed at detecting, identifying and addressing illegal content or information incompatible with their terms and conditions (...)'.
2 In data sciences, information retrieval and information filtering are related but distinct fields. Belkin and Croft (1992), for example, refer to them as two sides of the same coin. A common distinction between these is whether the system relies on a query by the user (information retrieval) or whether it relies on exploiting the user profile without explicit query (e.g. Bellogin & Said, 2019; Valcarce, 2015); sometimes also called active or passive recommendation systems (Llansó et al., 2020). This distinction, however, is not always clear-cut in regulatory discourses. In the following, therefore, I rely on the notion recommender systems only.

3 Often used with the purpose to capture attention of users and keep them engaged (Wu, 2016).
4 European Commission, COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on a Single Market For Digital Services (Digital Services Act) and amending Directive 2000/31/EC, Brussels, 15.12.2020 SWD(2020) 348 final, PART 1/2, p. 4.
5 Manish Agrawal, Maryam Karimzadehgan, and ChengXiang Zhai. 2009. An online news recommender system for social networks. In Proceedings of the Workshop on Search in Social Media (SSM 2009), co-located with ACM SIGIR 2009 Conference on Information Retrieval, Boston.

6 See <https://newsroom.spotify.com/2021-09-08/spotify-release-radar-personalized-playlist-celebrates-five-years-and-16-billion-streams/>
7 See <https://about.netflix.com/en/news/the-power-of-a-picture>
8 See <https://www.cnet.com/news/youtube-ces-2018-neal-mohan/>
9 <https://www.wsj.com/articles/facebook-knows-instagram-is-toxic-for-teen-girls-company-documents-show-11631620739>
10 Cf. recital 62 DSA.

11 See, for example, crowdsourcing of Netflix (<https://netflixtechblog.com/netflix-recommendations-beyond-the-5-stars-part-2-d9b96aa399f5>) and Spotify (<https://www.aicrowd.com/challenges/spotify-million-playlist-dataset-challenge>).

12 In September 2021, YouTube, for example, explained how it enforces 'border line content' with its recommender systems, following an announcement from 2019 to 'begin reducing recommendations of borderline content and content that could misinform users in harmful ways' (Goodrow, 2021).

13 See, e.g., <https://algotransparency.org> and <https://foundation.mozilla.org/en/campaigns/youtube-regrets/>

14 European Commission, Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on a Single Market For Digital Services (Digital Services Act) and amending Directive 2000/31/EC, COM/2020/825 final.

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2. REGULATING (SOME) RECOMMENDER SYSTEMS ON THE INTERNET

The proposal of the DSA was a high priority on the European Commission president Ursula von der Leyen's political agenda. It continues the recent EU developments to regulate Internet content and actors but marks a shift from the sector-specific approach (e.g. copyright or terrorist content) towards revisiting and adjusting the horizontal rules.

Art. 2(o) DSA puts forward a legal definition of a recommender system, which 'means a fully or partially automated system used by an online platform to suggest in its online interface specific information to recipients of the service, including as a result of a search initiated by the recipient or otherwise determining the relative order or prominence of information displayed'¹⁸ Recital 62 DSA provides further examples of how this is achieved, namely 'by algorithmically suggesting, ranking and prioritising information, distinguishing through text or other visual representations, or otherwise curating information provided by recipients.'

On the one hand, this definition limits the scope of application to recommender systems employed by online platforms (but not other intermediaries). On the other hand, the definition does not relate to specific forms of information (such as, e.g., intellectual property rights-protected content or news) but is content-agnostic¹⁹.

Since recommender systems in the EU lawmaker's view 'can have a significant impact on the ability of recipients to retrieve and interact with information online' and 'play an important role in the amplification of certain messages, the viral dissemination of information and the stimulation of online behaviour' (recital 26), the DSA stipulates certain duties (due diligence obligations) related to the use of recommender systems. Already the Inception Impact Assessment for the DSA from summer 2020 noted, that with inter alia recommender systems an 'entirely new set of issues has also emerged with the scale of information

intermediated online' notably because 'services are also abused to disseminate harmful content such as online disinformation (which is not, per se, illegal), exploiting algorithmic systems to amplify the spread of the messages'.²⁰ Specifically in relation to news recommender systems, Helberger et al. (2021), however, criticise that the proposed DSA framework misses to acknowledge the potential for positive contributions by recommender systems in democratic societies and lacks incentives to build recommender systems that 'contribute in the longer term to the realisation of public values such as media diversity'.

Importantly, the scope of these due diligence obligations suggested in the DSA regarding recommender systems is further restricted to very large online platforms (VLOPs). An 'online platform' is a provider of a hosting service which 'at the request of a recipient of the service, stores and disseminates to the public information' (art. 2(h) DSA). In other words, social media platforms that allow for user uploads like YouTube, Facebook, Twitter, Instagram or TikTok would be considered an online platform. More specifically, however, only *very large* online platforms would be covered by the specific due diligence obligations for recommender systems. In essence, these VLOPs are online platforms with more than 45 million monthly active users in the EU (art. 25 DSA). Effectively, this significantly narrows the proposed rules' scope. Civil society organisations have therefore criticised that the proposed rules set a low bar and should apply to any online platform, not just the very large ones (Article 19, 2021a). In any case, however, services like Spotify or Netflix, where the content or information is provided by the platform, would not be falling within the scope of the DSA, since they are not online platforms in the sense of art. 2(h) DSA.²¹ Considering that content on user-upload platforms may not be 'vetted in the same way as it is on Netflix' (Goanta & Spanakis, 2020), this differentiation seems reasonable.

2.1. TRANSPARENCY AND USER'S INFLUENCE OVER RECOMMENDER SYSTEMS

The primary beneficiaries of the due diligence provision for recommender systems (art. 29 DSA) are 'recipients of the service' (recital 62 DSA), i.e. (end)users of said platforms²². According to art. 29(1) DSA, VLOPs 'shall set out in their terms and conditions, in a clear, accessible and easily comprehensible manner, the main parameters used in their recommender systems, as well as any options for the recipients of the service to modify or influence those main parameters that they may have made available, including at least one option which is not based on profiling'. In other words, VLOPs' recommender systems would be subject to both (1) a transparency requirement relating to main parameters, as well as (2) a requirement to offer a non-profiling-based option for influencing those parameters.

15 or hosting services like online platforms, for example, it sets out the basic principles behind notice-and-action mechanisms, see art. 14 eCommerce Directive.

16 Compare, e.g., the European Commission's soft law approach regarding disinformation (Code of Practice on Disinformation) or the P2B Regulation on ranking algorithms (Regulation (EU) 2019/1150 of the European Parliament and of the Council of 20 June 2019 on promoting fairness and transparency for business users of online intermediation services, OJ L 186, 11.7.2019, p. 57–79).

17 European Commission, Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL LAYING DOWN HARMONISED RULES ON ARTIFICIAL INTELLIGENCE (ARTIFICIAL INTELLIGENCE ACT) AND AMENDING CERTAIN UNION LEGISLATIVE ACTS, COM/2021/206 final.

18 Thus, the proposed definition covers both systems for information retrieval and information filtering.

19 This is in line with the overall approach of the DSA (and the eCommerce Directive) which applies to all forms of (illegal) information.

20 European Commission, COMBINED EVALUATION ROADMAP/INCEPTION IMPACT ASSESSMENT: Digital Services Act package: deepening the Internal Market and clarifying responsibilities for digital services, Ref. Ares(2020)2877686 - 04/06/2020, p. 3.

21 Similarly, outside the world of entertainment content, a recommender system used in the context of legal information retrieval, for example, case search, would not fall in the DSA's scope.

22 In the context of systemic risks on the access to data by vetted researchers see art. 31 DSA and the analysis by Leerssen (2021).

2.1.1. USER-FACING TRANSPARENCY IN TOS

In relation to the first point, transparency, the DSA proposal, refrains from further specifying what would be understood as main parameters. This leaves a margin of discretion for platforms and constitutes likely a context-dependent standard. In the proposal, it is also unclear whether this requirement only covers *parameters* or also information on who – besides VLOP and users – exercises influence *over* those parameters.²³ The Impact Assessment accompanying the European Commission's DSA proposal explains that the provision aims at 'enabling users to understand why, and influence how information is being presented to them'²⁴ It furthermore notes that transparency would be 'particularly impactful in offering the means for detecting discriminatory practices and allowing these issues to surface on the policy and public agenda'²⁵ With this ambition in mind, it seems that the requirement should be understood as covering not only information about main parameters, but indeed also about which parties may influence them. Since this is unclear in the Commission's proposal, a clarification in the legislative process is desirable.

The language standard ('clear, accessible and easily comprehensible manner') aimed at minimising the 'legalese' of terms and conditions (T&C) resembles that laid out in the General Data Protection Regulation (GDPR)²⁶. In this context, the European Data Protection Supervisor (EDPS) 'strongly recommends' that such information should be presented separately from T&Cs, since these 'are generally lengthy and legalistic documents that average users have difficulties to understand' EDPS (2021)²⁷. In any case, the transparency requirement would, as it stands, not require any specific –personalised or not– explanation attached to the concrete recommendation²⁸. Instead, a (more or less general) description of the recommender system's main parameters in the platform's ToS would suffice²⁹.

2.1.2. FUNDAMENTAL RIGHTS PROTECTION THROUGH T&CS?

Art. 12 DSA, which applies to all intermediary service providers and not only very large online platforms, too, contains an intriguing mechanism: This general clause on T&Cs stipulates that information about content moderation practices, e.g. related to algorithmic decision-making and human review, must not only be accessible but that intermediary service providers must also 'act in a diligent, objective and proportionate manner' with due regard to rights and legitimate interests of all involved parties, including fundamental rights of users (art. 12(2) DSA). The requirement is vague (Appelman et al., 2021) and it is unclear whether it e.g. introduces the requirement of a fundamental rights assessment by intermediaries through the 'backdoor' of T&Cs. Its application to recommender systems, too, is uncertain. Since art. 12(1) DSA relates to imposed 'restrictions', i.e. the disabling of content, however, it seems that such assessment would not be required in the context of recommendations of content.

2.1.3. USER'S INFLUENCE OVER RECOMMENDER SYSTEMS

The second main point of art. 29 DSA relates to the very offering of recommender systems by VLOPs: it aims to ensure that users 'enjoy alternative options for the main parameters, including options that are not based on profiling of the recipient' (recital 62). In instances where several choices are available, art. 29(2) DSA additionally stipulates that the function for switching between these options must be 'an easily accessible functionality'. The requirement to offer a non-profiling-based option³⁰, for example, might influence nearest neighbour practices. According to the EDPS, however, the proposal is not going far enough from a data protection perspective: He argues that VLOPs' recommender systems based on profiling should be on opt-in rather than opt-out basis' in accordance with the requirements of data protection by design and by default and data minimisation' (EDPS, 2021) as set out by the GDPR.³¹

2.1.4. SYSTEMIC RISKS OF (AND QUA) RECOMMENDER SYSTEMS

In addition to the specific obligations for recommender systems, VLOPs would also be obliged to conduct annual risk assessments to assess 'any significant systemic risks stemming from the functioning and use made of their services in the Union' (art. 26(1) DSA). More specifically, such systemic risks can relate to the (a) dissemination of illegal content, (b) any negative effects for the exercise of

23 The question of (third-party) influence over recommendations seems to not be explicitly addressed in the current legislative developments. In the entertainment industry, for example, rights holders may have a keen interest in determining what content user is exposed to. Spotify, for example, recently enabled rights holders to influence recommendations (Spotify, 2020).

24 European Commission, COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT ANNEXES Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND THE COUNCIL on a Single Market For Digital Services (Digital Services Act) and amending Directive 2000/31/EC, Brussels, 15.12.2020 SWD(2020) 348 final, PART 1/2, point 163, p. 45.

25 Ibid., point 247, p. 64.

26 REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), OJ L 119, 4.5.2016, p. 1–88.

27 The EDPS also suggests a variety of other improvements, such as that users easily can delete any profile 'used to curate the content they see' and to allow for customisation of recommender systems 'based at least on basic natural criteria (e.g., time, topics of interest, ...) EDPS, (2021).

28 As for news recommendations for example explored by Ter Hoeve et al. (2017) and van Drunen et al., (2019) or in the context of Facebook's 'why am I seeing this?' (Sethuraman, 2019); more generally on limitations see Ananny & Crawford, (2018).

29 Interestingly, the DSA foresees an explanation of take down or (algorithmic) content moderation decisions by hosting services (Quintais & Schwemer, 2021), cf. art. 15 DSA.

30 See art. 4(4) GDPR.

31 Also supported by civil society organisation Panoptikon (Panoptikon Foundation, 2021).

32 A proposed European Board for Digital Services (EBDS) would be required to publish comprehensive reports on a yearly basis inter alia with a view to provide best practices for VLOPs to mitigate the systemic risks identified. Furthermore, the European Commission, in cooperation with the (national) Digital Services Coordinators would –under certain circumstances– have competence to issue guidelines.

fundamental rights, or (c) the intentional manipulation of the service 'with an actual or foreseeable negative effect on the protection of public health, minors, civic discourse, or actual or foreseeable effects related to electoral processes and public security.'

In this yearly assessment, VLOPs would be held upon to in particular take into account how their recommender systems influence any of the system risks, 'including the potentially rapid and wide dissemination of illegal content and of information that is incompatible with their terms and conditions' (art. 26(2) DSA). Based on this risk assessment, VLOPs are then required to put in place reasonable, proportionate and effective mitigation measures, which includes the adaption of their recommender systems (art. 27(a) DSA).³²

This implies, for example, that VLOPs would need to assess whether a recommender system promotes illegal information (such as, e.g., copyright-infringing content or illegal hate speech) in a way that amounts to a 'significant risk' and put in place such mitigation measures. These measures are not further elaborated on in the DSA, but the Impact Assessment points towards the 'way the very large platforms design and maintain their [recommender] systems'³³. Whereas the DSA principally only addresses illegal information, the risk assessment and mitigation mechanism seems to extend the due diligence obligations' scope to unwanted ("lawful, but awful") information, such as e.g. the spreading of mis- or disinformation.³⁴ The details of such assessment and mechanism, however, remain vague.³⁵

3. RECOMMENDER SYSTEMS AS 'AI SYSTEMS'

The recently proposed AIA, too, may become relevant for recommender systems. The AIA proposal continues in the vein of the European Commission's White Paper on AI, which set policy requirements on how to achieve the two-fold aim to both promoting the use of AI and to address its associated potential risks.

³² A proposed European Board for Digital Services (EBDS) would be required to publish comprehensive reports on a yearly basis inter alia with a view to provide best practices for VLOPs to mitigate the systemic risks identified. Furthermore, the European Commission, in cooperation with the (national) Digital Services Coordinators would –under certain circumstances– have competence to issue guidelines.

³³ DSA Impact Assessment part 1, point 235, p. 62.

³⁴ For a policy perspective on disinformation and the DSA, see e.g. (EU Disinfo Lab, 2021). Note that art. 26(1) DSA refers not only to illegal information but also information that is incompatible with the platform's ToS. This, one could argue, opens the door for private regulation co-setting the standard for systemic risks.

³⁵ Article 19 (Article 19, 2021b), for example, criticises the proposed art. 26/27 DSA mechanism inter alia for the 'insufficient protection of fundamental rights'.

³⁶ European Commission, WHITE PAPER On Artificial Intelligence - A European approach to excellence and trust, Brussels, 19.2.2020 COM(2020) 65 final.

³⁷ Focus on risks to the health or safety or the protection of fundamental rights of natural persons concerned, see, e.g. Schwemer et al. (2021).

³⁸ Inter alia design and development requirements in addition to further obligations for e.g. users or importers.

The proposal's definition of an AI system (art. 3(1) AIA), inspired by the OECD, is broad (Schwemer et al., 2021; Veale & Borgesius, 2021) and recommender systems appear at first glance to fall within its scope. The AIA proposal is highly inspired by the EU's product regulation and follows a risk-based approach.³⁷

It differentiates between four types of risk:

Unacceptable risk: prohibited;

- High-risk: permitted but subject to specific obligations;³⁸
- Limited risk: subject to certain transparency obligations;
- Minimal risk: not addressed by the AIA.

3.1. PROHIBITED AI PRACTICES

Art. 5 of the proposal prohibits inter alia the placing on the market, putting into service or use of an AI system that 'deploys subliminal techniques beyond a person's consciousness in order to materially distort a person's behaviour in a manner that causes or is likely to cause that person or another person physical or psychological harm' (art. 5(1) lit. a AIA) or that 'exploits any of the vulnerabilities of a specific group of persons due to their age, physical or mental disability, in order to materially distort the behaviour of a person pertaining to that group in a manner that causes or is likely to cause that person or another person physical or psychological harm' (art. 5(1) lit. b AIA).

The question is then whether (and when) a recommender system would fall under these prohibitions. Recital 16 AIA further elaborates that the envisioned prohibited AI systems deploy subliminal components 'with the *intention* to materially distort the behaviour of a person and in a manner that causes or is likely to cause harm to that or another person' (emphasis added). Already the Council of Europe, (2019) pointed out that '[c]ontemporary machine learning tools have the growing capacity not only to predict choices but also to influence emotions and thoughts and alter an anticipated course of action, sometimes subliminally' (point 8). The exact scope of the prohibitions in art. 5(1) lit. a and lit. b AIA, however, remains vague. Suffice it here to note that there is to be expected an important policy debate about which systems would fall under the prohibitions of art. 5 AIA especially with regards to the recommender systems of social media platforms.

3.2. RECOMMENDER SYSTEMS AS HIGH-RISK AI SYSTEMS

High-risk AI systems, on the other hand, are not prohibited but subject to specific obligations. Art. 9 AIA, for example, requires a risk management system, where foreseeable risks and other possibly arising risks need to be evaluated in a 'continuous iterative process'. A further requirement relates to data governance, where training, validation and testing data must be 'relevant, representative, free of errors and complete' (art. 10(3) AIA). Besides other obligations, also human oversight (art. 14 AIA) is required.

The question, however, is whether recommender systems would be considered high-risk (art. 6 AIA) in the first place. Only then would the mentioned obligations be mandatory. Annex III of the AIA sets forth eight pre-selected 'areas'³⁹ with accompanying

specific use cases, where the use of AI systems is deemed high-risk because risks have already materialised or are likely to materialise in the near future.⁴⁰ Recommender systems used in legal information retrieval by a judicial authority, for example, might be deemed high-risk (Schwemer et al., 2021). AI systems used in connection with e.g. e-commerce or entertainment content, on the other hand, it seems, would not fall under any of the high-risk areas (or rather their concrete use cases) in Annex III of the AIA proposal at this stage.⁴¹

Since the AIA proposal foresees self-regulation namely by facilitating and encouraging the voluntary application of the obligations for high-risk AI systems by non-high-risk AI systems (art. 69 AIA), however, the obligations might become relevant for recommender systems beyond the narrow group of AI systems currently deemed high-risk AI in the proposal.

Additionally, AI systems that are intended to interact with natural persons are subject to certain transparency obligations (art. 52 AIA). Natural persons need to be informed of the fact that they interact with an AI system, unless obvious from the circumstances. Thus, recommender systems (provided they qualify as AI system in the AIA) may have to carry a label disclosing that a recommendation is not coming from a human; the practical importance of this, however, is likely to be low since the context of use of such recommender system regularly would make it obvious that no human is involved in the recommendation in the first place.

4. FROM 'RESPONSIBLE' TO 'RESPONSIBLE AND COMPLIANT' RECOMMENDER SYSTEMS?

Until recently, recommender systems have as topic surprisingly been treated rather stepmotherly in the EU's legislative agenda. Compliance has, it seems, primarily been a data protection issue.⁴² With the two recent proposals of the European Commission, the DSA and –to some extent– the AIA, this is likely to change.

As seen, the scope of both proposed instruments is restricted. The DSA proposal, on the one hand, only covers the recommender systems of VLOPs, i.e. a handful of very large online platforms that allow for user uploads on the Internet. The AIA's scope of prohibitions regarding recommender systems, on the other hand, seems uncertain and its proposed design and development requirements only apply to the relatively narrow group of high-risk AI systems. The overlap between those two, VLOPs' recommender systems and high-risk AI systems, is likely small.

Also the regulatory approach of the two instruments differs. The DSA focusses on *transparency* and –to some extent– *user's influence* over recommender systems from a (end-)user perspective. Notably, the DSA would not require explanations of recommendations but merely a (more or less general) description of the recommender system's main parameters in the platform's T&C's.⁴³ The AIA, where applicable and besides prohibitions, focusses primarily on the *design and development* of such AI system. It does not provide any rights for end-users affected at AI system but focuses on the provider, user, distributor and importer of such AI system. Both the DSA and the AIA

proposals point towards a somewhat sector-oriented (even if content-agnostic) approach for the regulation of recommender systems and a complex emerging regulatory landscape. It may, however, be interesting to consider whether some of the proposed rules are relevant more broadly for recommender systems. Should the DSA's approach to transparency and non-profiling-based options, for example, be a general rule beyond the 'very large' online platform world? Would the DSA's proposed rules not be as relevant in the context of 'regular' online platforms? And even beyond the online platform world: Admittedly, context and purpose for which recommender systems are used vary greatly. Recommending a relevant court case to a legal researcher or judge may pose different questions and challenges than recommending music to a consumer or news to a social media user. Yet, the opacity of these systems, it appears, is a general concern. In order to ensure a futureproof legislative framework and to minimise regulatory complexity, it seems timely to identify basic first principles (related to, e.g., transparency but also other areas of interest such as influence over or fairness of recommender systems), which are relevant beyond the more specific angle of current regulatory interventions.⁴⁴

Both proposed instruments, the DSA and the AIA, in any case, raise also important questions around the concept of responsibility in recommender systems. Fairness, accountability and transparency are to varying degree touched upon in the proposed (and existing) regulation. Compliance with hard law, however, is only one starting point for responsible recommender systems. The DSA and AIA are legislative proposals that will be discussed, changed and amended by the European Parliament and European Council over the coming (months and in the case of the AIA potentially). For meaningful legislation to emerge it will be paramount that relevant communities engage in these ongoing discussions.

39 The eight areas in Annex III are: Biometric identification and categorisation of natural persons; Management and operation of critical infrastructure; Education and vocational training; Employment, workers management and access to self-employment; Access to and enjoyment of essential private services and public services and benefit; Law enforcement; Migration, asylum and border control management; and Administration of justice and democratic processes.

40 The specific use cases can be updated by the European Commission, whereas the eight areas cannot be changed without further legislative intervention, cf. art. 7 AIA.

41 This may be particularly surprising with regards to algorithmic content moderation since a high error rate (whether intentional or not) may have repercussions for fundamental rights most notably freedom of expression.

42 Regulation (and regulability) of recommender systems is of interest from a variety of legal perspectives, such as data protection (Jeckmans et al., 2013; Krebs et al., 2019), media law (Helberger et al., 2021), copyright law (Senfleben et al., 2021), or competition law and consumer protection (Stasi, 2019).

43 Interestingly, the DSA foresees an explanation of take down or (algorithmic) content moderation decisions by hosting services (Quintais & Schwemer, 2021), cf. art. 15 DSA.

44 More specific interventions, e.g. those addressing specific forms of content (e.g. hate speech or IP-protected works) as well as uses of recommender systems giving rise to specific issues (e.g. news), could then build upon and adjust these basic requirements as fit.

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