An Introduction to Automated Decision Making (ADM) and Cyber-Delegation in the Scope of EU Public Law

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Automated decision-making (ADM)[1] systems are based on software supporting, or replacing, elements of human decision making in implementation of EU law. ADM systems are deployed in an increasing amount of policy areas. They support decision-making and rule-making procedures by EU institutions and bodies as well as by Member State bodies acting in the scope of EU law. Improved availability of information and advanced computation power to process such information produces benefits for decision-making. But integrating technological solutions into decision making procedures risks introducing potential dysfunctionalities, diminishing individual rights, and reducing accountability.

This paper introduces and gives an overview over many of the design questions which the use of ADM in public decision-making procedures in the scope of EU law therefore raises. Can compliance with general principles of EU administrative law and its specific legislative requirements be ensured in an anticipatory manner? Which requirements of technical design of ADM systems and their relation to the data basis, which are used as sources of information searches and analysis are necessary? On the other hand, how should ADM technology relate to elements of human decision making and how to ensure meaningful *ex post* accountability mechanisms, remedies, and possibilities of effective judicial protection.

The paper argues that addressing design questions must consider the nature of the technological integration into decision-making procedures and the decision-making phases in which ADM systems will be deployed. Further, the paper argues that the interface between an ADM system and the underlying data basis defines many of the legal

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[1] An "automated decision system" can be defined as software, a system, or a process that aims to aid, or replace human decision-making. See: Rashida Richardson, 'Confronting Black Boxes: A Shadow Report of the New York City Automated Decision System Task Force' (AI Now Institute 2019) 6 (https://ainowinstitute.org/ads-shadowreport-2019.pdf).

issues relevant. Finally, another premise this paper develops is that it is necessary to distinguish between conditions governing, on the one hand, the quasi rule-making character of ADM *systems* from, on the other hand, *individual decisions* made with the help of ADM technology. On this basis, the paper discusses possibilities and requirements of review, especially of legal principles applicable in reviewing decision making with ADM in EU public law.

ADM technology and data collections in EU Administrative Law

ADM technology affects decision making and rule-making procedures predominantly by its technological characteristics, the relation between ADM and data basis as well as the relation between ADM technology and human elements of decision-making. The technological side of ADM, which is programmed in technical terms of computer science, is necessarily opaque to non-experts. Thus, some background as to the technical side is necessary to understand the various approaches to ADM technology applied.[2]

1. ADM technology – algorithms, predictions, machine learning technology

ADM technologies are based on software[3] to automate, accelerate and scale the analysis of data.[4] Data extracted from one or several large-scale data bases is used to calculate probabilities according pre-defined steps to fulfil certain steps of a programme. Software may also contain one or several elements of what is known as artificial intelligence (AI). AI is described by the Commission's draft "regulation on a European approach for artificial intelligence" as "a fast-evolving family of technologies that can contribute to a wide array of economic and societal benefits".[5] AI programming allows to infer complex,

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[2] Annex 1 of the Commission's draft Regulation on a European Approach for Artificial Intelligence (REAAI) of 21 March 2021 listed lists a set of technologies to be covered, all of which include "machine learning approaches, including supervised, unsupervised an reinforcement leaning, using a wide variety of methods including deep learning loci an knowledge-based approaches, including knowledge representation inductive(logic) programming, knowledge bases, inference/deductive engines (symbolic) reasoning and expert systems; statistical approaches, Bayesian estimation, search and optimization methods."

[3] ADM systems are normally embedded in software which can also be a component of hardware devices (for example within robots used by emergency response teams, or in autonomous drones).

[4] Andrea Renda, 'Artificial Intelligence: Ethics, Governance and Policy Challenges.' (CEPS Task Force 2019) 8 <https://www.ceps.eu/wp-content/uploads/2019/02/AI_TFR.pdf>.

[5] Commission's draft Regulation on a European approach for artificial intelligence of 21.4.2021, COM(2021)206 final.

nonlinear relationships from the data which the software analyses. It does so to achieve a specific goal by identifying and, if necessary, automatically refining (or prompting the refinement of) a system's operations.[6]

Various approaches to AI programming are evolving.[7] Looking at different examples shows that effects on possibilities of tracing details of the calculations made are not equal.[8] For example, one approach to AI programming focusses on 'symbolic systems'. The latter requires software to provide pre-defined, step-by-step specifications of the rules, facts, and structures that define the characteristics of the evolving calculations of probabilities made by the computer program. Symbolic AI is tied to representations provided by humans undertaking the programming. Therefore, it allows, in principle, for explanations on the outcome of specific calculations as well as documenting programme-specific requirements.[9]

Other approaches to AI are based on machine learning, which trains a computer system on a set of input data and expected outcomes. For example, input could consist of characteristics of an applicant for a travel visa, whereas in this example the outcome would be the decision to grant or withhold a visa. Machine learning software uses the information provided in training data as well as past decision making to calculate parameters capable of linking inputs to outputs. This form of AI does not need to be based on explicit 'if-then rules'. It calculates on the basis of previously unseen input the possible outcome.[10] From a point of view of accountability of decision-making this type of approach requires a more clearly defined function of reporting of approaches to decision making being symbolic AI, which is more explained by if-then provisions of algorithms. In machine learning, problems of comprehensibility persist since machine learning models are based on various calculations representing first, the inputs and how they are weighted, second, the outputs that the system produces, and, third, the actual machine learning model, which as much AI programming might suffer from weaknesses in identifying relations between cause and effects.[11]

A third approach consists of AI systems being developed to produce results based on so called 'unsupervised learning'. Thereby, the software is programmed to produce a possible

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[6] Karen Yeung, *TLI think!* Paper 62/2017, p. 1 (SSRN abstract=2972505), abstract.

[7] For a typology on the different ADM decision types, see e.g., Maja Brkan, 'Do Algorithms Rule the World? Algorithmic Decision-Making and Data Protection in the Framework of the GDPR and Beyond' (2019) 27 International Journal of Law and Information Technology 91, 94–5.

[8] For a discussion of AI consequences to EU law more generally, see: European Commission White Paper on AI (COM(2020) 65 final).

[9] Herbert Roitblat, Algorithms Are Not Enough (MIT Press: Boston 2020), 344.

[10] Herbert Roitblat, Algorithms Are Not Enough (MIT Press: Boston 2020), 344.

[11] Herbert Roitblat, Algorithms Are Not Enough (MIT Press: Boston 2020), 344.

output, but the programme does not require labeled examples concerning the input. This AI technology is being developed to develop pattern-recognition, for example, to detect anomalies for improving cyber-security or for customer-segmentation in product marketing. Such AI can be highly useful in 'agenda setting' and initiation of administrative procedures, for example in financial market supervision, where large amounts of data without clear previous indications of what the input should look like need to be analysed. Supervision of such AI tends to be more difficult than machine learning approaches since there are fewer clear links between input and output, which the software-developer or an independent analyst can be asked to identify.

Various ADM systems may be used in several, sometimes subsequent, phases of decision-making procedures. Although to date ADM systems are rarely known to have been employed in all phases of a decision-making process – from agenda setting to implementation,[12] today's most frequent use of ADM is in agenda setting and investigation phases from which results can pre-define certain decision making.[13]

Growing technical capabilities of AI based software used in ADM systems, however, contribute to their ability to re-shape the procedural design of implementation of EU policies. Implicitly, such reshaping changes the conditions of accountability of administrative rule making and decision-making procedures where ADM technology is used.

2. Normative Programming and ADM

As much as the use of algorithmic decision making by public institutions in Europe is evolving, it is, from a legal point of view, not fully addressed. Fundamental difficulties for understanding and assessing the use of algorithms in public policies persist in various dimensions.[14]

One is a semantic and conceptual dimension. ADM systems are based on software designed by computer scientists programming algorithms on a particular understanding of requirements under the law. Although legal requirements can - under certain circumstances - resemble a programme, which can be portrayed in forms of an algorithm,

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[12] A rare example is a speed camera on the roadside analysing a violation of speed limitations and automatically mailing speeding tickets to the registered car owners.

[13] Maciej Kuziemski and Gianluca Misuraca, 'AI Governance in the Public Sector: Three Tales from the Frontiers of Automated Decision-Making in Democratic Settings' (2020) 44 Telecommunications Policy 101976.

[14] Marta Cantero Gamito and Martin Ebers, 'Algorithmic Governance and Governance of Algorithms: An Introduction' in Martin Ebers and Marta Cantero Gamito (eds), *Algorithmic Governance and Governance of Algorithms: Legal and Ethical Challenges* (Springer International Publishing 2021) <https://doi.org/10.1007/978-3-030-50559-2_1> accessed 13 May 2021.

the complex interaction of legal rules and principles does not necessarily open itself to current standards of programming.

Here questions of normative programming of administrative rule-making and decision-making procedures arise, which may contain specificities to be considered when thinking of a 'cascade'-approach to normative programming. In the traditional model, public decision-making has a legal basis and a normative framework in constitutional norms and values. Programming of public activity within this frame takes place by legislative acts, which are implemented with the help of executive rulemaking and finally single case decision making by agencies. ADM technology must comply with the normative framework and be employed in the context of legislative authorisation. Therefore, software underlying ADM technology will generally either replace or supplement executive rulemaking in preparation of individual decision-making. It may also cover both rule-making and decision-making procedures. In this respect, the CJEU has established that there are legal requirements as to the programming of ADM systems. The latter must, like administrative rulemaking, pre-establish "models and criteria on which that type of data processing are based should be, first, specific and reliable, making it possible to achieve results".[15]

The function of ADM in public law is thus to be used in the context of implementing policies defined in the Treaties and by EU or Member States legislative act. With this, ADM shall be based on a set of procedural rules designed to contribute to the translation of abstract legislative obligations to concrete individual decision making and thus function, for all practical purposes, like administrative rule making. Yet, as will be discussed further below, criteria for delegation of decision-making power are strictly circumscribed by EU law requiring legal acts in the form of acts under Article 288 TFEU to outline such essential tasks as defining under which conditions a fundamental right might be limited (Article 52(1) CFR). The criteria for legality of rule-making procedures and their design would thus be the starting points for designing (*ex ante* perspective) and assessing ADM systems (*ex post* perspective).

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[15] Judgement of the Court (Grand Chamber) of 6 October 2020: C-511-520/18 *La Quadrature du Net* ECLI:EU:C:2020:791, para 180 with references to Opinion 1/15 (*EU-Canada PNR Agreement*) of 26 July 2017, EU:C:2017:592, paragraph 172.

3. EU Large-Scale Information Systems and ADM

In EU administrative law, the development of ADM is often linked to the establishment of large-scale information systems. ADM require large sets of data to be able to provide the quantity and quality of data processing. Large scale data sets require ADM technology to process the data to make use of the advantages of data availability for decision-making. Some of the most well-known large scale information systems in the EU are in the field of the Area of Freedom, Security and Justice (AFSJ) such as the Schengen Information System (SIS II).[16] The link between the development of large scale data bases and ADM technology is explicit in the creation of a single agency (eu-LISA)[17] in charge of development of information collection and storage in its fields of competence[18] as well as following reforms eu-LISA's mandate,[19] in planning and preparing the systems for the

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[16] A large-scale information system for border management in operation in 30 European countries, including 26 EU Member States (with the exception of Ireland and Cyprus) and 4 associated countries (Switzerland, Norway, Liechtenstein and Iceland). Regulation (EU) 2018/1860 on the use of the Schengen Information System for the return of illegally staying third-country nationals, OJ 2018 L 312/1; Regulation (EU) 2018/1861 on the establishment, operation and use of the Schengen Information System (SIS) in the field of border checks, OJ 2018 L 312/14; Regulation (EU) 2018/1862 on the establishment, operation and use of the Schengen Information System (SIS) in the field of police cooperation and judicial cooperation in criminal matters, OJ 2018 L 312/56. In EU administrative law, the spread of ADM is often linked to the development of large-scale information systems under EU law (https://ec.europa.eu/home-affairs/what-we-do/policies/borders-and-visas/schengen-information-system_en.). Other EU large scale information systems include Eurodac used by Europol and associated bodies. See: Regulation (EU) 2016/794 of the European Parliament and of the Council of 11 May 2016 on the European Union Agency for Law Enforcement Cooperation (Europol)] adopting the implementing rules governing Europol's relations with partners, including the exchange of personal data and classified information; OJ 2009 L 325/6.. OJ 2000 L 316/1 and Articles 4-7 and 15 of Council Regulation (EC) 2725/2000 of 11 December 2000 [No longer in force - Date of end of validity: 19/07/2015; Repealed by Regulation (EU) No 603/2013 of the European Parliament and of the Council of 26 June 2013 concerning the establishment of Eurodac

[17] EU-LISA, is an agency established under Regulation (EU) No 1077/2011 of the European Parliament and of the Council of 25 October 2011 establishing a European Agency for the operational management of large-scale IT systems in the [AFSJ], OJ 211 L 286/ 1–17 replaced by Regulation (EU) 2018/1726 of the European Parliament and of the Council of 14 November 2018 on the European Union Agency for the Operational Management of Large-Scale IT Systems in the Area of Freedom, Security and Justice (eu-LISA), OJ 2018 L 295/99–137.

[18] The EU-LISA agency is not only a technical operator in this, but by establishing the software and protocols is actually active in norm-setting for decision making procedures. Additionally, it is also an active player in designing future rule-making standards. See e.g. eu-LISA, 'Elaboration of a Future Architecture for Interoperable IT Systems at Eu-LISA - Summary of the Feasibility Study' (2019) 4 https://www.eulisa.europa.eu/Publications/Reports/eu-LISA%20Feasibility%20Study%20-%20Interoperability.pdf.

[19] Regulation (EU) 2018/1726 of the European Parliament and of the Council of 14 November 2018 on the European Agency for the operational management of large-scale IT systems in the [AFSJ], and amending Regulation (EC) No 1987/2006 and Council Decision 2007/533/JHA and repealing Regulation (EU) No 1077/2011, OJ 2018 L 295/99–137. [Hereafter, the 'eu-LISA Regulation']. With

ADM capacities. Other large-scale information systems exist for example in the areas regulating risk in food, animal feed, plant health,[20] human and veterinary medicine products.[21]

These examples of data collections in risk regulation in the food, feed, and medicine products as well as in the AFSJ, illustrate the links between data collections in EU administrative law and ADM from at least three aspects:

First, in single market regulation, as well as in data collections pertaining to the AFSJ, interoperability is becoming the norm for connecting different data bases established initially for different causes.[22] The principle of interoperability enables interconnectivity of data collections and thereby enlarges the 'data lake' available to processing by ADM technology.[23] For example, in the field of AFSJ, the Electronic Travel Information and Authorisation System (ETIAS)[24] and the Passenger Name Record (PNR)[25] system will

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respect to the SIS specifically, eu-LISA's tasks are listed under Chapter III of the SIS-recast, involving responsibilities of operational management (Article 15); security (Article 16); confidentiality (Article 17); and lastly, keeping of logs at central level (Article 18). Moreover, eu-LISA should provide training on the technical use of SIS, especially for the staff of the SIRENE Bureaux, and to other experts involved in the Schengen evaluation (Article 3 of eu-LISA Regulation).

[20] Commission Implementing Regulation (EU) 2019/1715 of 30 September 2019 laying down rules for official controls and its system components ('the IMSOC Regulation'), *OJ 2019 L* 261/ 37–96. This allows for automatised exchange of information and documents in the context of a computerised information management system for official controls. Point 2 of the Preamble refers to the need of interoperability of information systems managed by the Commission and certain national systems. Theselink, *inter alia* a system for notifying and reporting information on animal diseases Regulation (EU) 2016/429 of the European Parliament and of the Council of 9 March 2016 on transmissible animal diseases, the system for notifying and reporting the presence of pests in plants and plant products (EUROPHYT, Regulation (EU) 2016/2031 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants). Technical tools for administrative assistance and cooperation (AAC and TRACES, Regulation (EU) 2017/625 of the European Parliament and of the Council of 15 March 2017 on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products)..

[21] See: Simona Demková, The Decisional Value of Information in European Semi-Automated Decision Making, Review of European Administrative Law 2021 (forthcoming), 9.

[22] The protection of personal data is particularly vulnerable to this because of the principle of purpose limitation of data collection.

[23] Teresa Quintel, 'Connecting Personal Data of Third Country Nationals: Interoperability of EU Databases in the Light of the CJEU's Case Law on Data Retention' (2018) 002–2018 University of Luxembourg Law Working Paper Series <https://ssrn.com/abstract=3132506 or http://dx.doi.org/10.2139/ssrn.3132506> accessed 2 April 2018.

[24] Regulation (EU) 2018/1240 of the European Parliament and of the Council of 12 September 2018 establishing a European Travel Information and Authorisation System (ETIAS) and amending Regulations (EU) No 1077/2011, (EU) No 515/2014, (EU) 2016/399, (EU) 2016/1624 and (EU) 2017/2226, OJ L 236, 19.9.2018, p. 1–71, pursuant to which visa free Third Country Nationals (TCNs) have to apply for an electronic authorization in order for the risk they pose to be assessed in advance.

become linked with interoperability functions, allowing for searches taking place within these databases to be enriched with data from certain interconnected other databases.[26] It also allows for further integration of ADM technologies into decision making procedures by introducing novel technical capacities for matching of available data.[27] Moves to increase this approach and make it more accessible for ADM systems exist also in the context of developments of a 'public cloud' approach linking national and European public data collections and offering safe storage solutions.[28]

Second, next to interoperability requirements, relying on the sharing of information across different *systems*, sharing data across *EU and Member State administrations* is an important approach in EU administrative law to enlarge data availability.[29] The distribution of data collections in Member States is a central approach to de-central administration in the EU.[30] De-central implementation of EU policies is increasingly undertaken by administrative networks linking Member States and EU bodies.[31] These

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[25] Directive (EU) 2016/681 of the European Parliament and of the Council of 27 April 2016 on the use of passenger name record (PNR) data for the prevention, detection, investigation and prosecution of terrorist offences and serious crime, OJ L 119, 4.5.2016, p. 132–149.

[26] Niovi Vavoula, 'Consultation of EU Immigration Databases for Law Enforcement Purposes: A Privacy and Data Protection Assessment' (2020) 22 European Journal of Migration and Law 139, 145–146.

[27] Such novel ADM capacities are especially embedded in the shared BMS interoperability tool, see eu-LISA, 'Shared Biometric Matching Service (SBMS): Feasibility Study - Final Report' (eu-LISA 2018) Website <http://op.europa.eu/en/publication-detail/-/publication/10175794-3dff-11e8-b5fe-01aa75ed71a1/language-en> accessed 13 May 2021.

[28] ESMA, *Annual Report 2018* (14.06.2019), ESMA20-95-1136, p. 54. IT helpdesk requests, filed actions in the field of cybersecurity surveillance and intelligence. ESMA is planning the migration of its database to a Public Cloud Infrastructure in 2019. Increasingly, the development towards having joint cloud data storage solutions for public and private data is being developed. In view of highened awareness of the necessity of 'strategic autonomy' on the basis of an initiative of some Member State governments initiated the creation of 'GaiaX' based on a non-profit industry consortium of European private and public actors. The GAIA-X Association aisbl ('association internationale sans but lucratif' - a non-profit organisation under Belgian law) was created on the initiative of the French and the German governments by a set of private companies and public research institutions. The project links various European service providers and is also supposed to offer secure sites for public data cloud solutions.

[29] See in other context, for instance, as part of the EU Digital Strategy, the efforts on the re-use of public sector information European Data Protection Supervisor, 'Opinion 5/2018 on the Proposal for Recast of the Public Sector Information (PSI) Re-Use Directive (Directive of the European Parliament and of the Council on the Re-Use of Public Sector Information)' <https://edps.europa.eu/sites/edp/files/publication/18-07-11_psi_directive_opinion_en.pdf> accessed 1 September 2019.

[30] *See e.g.* Deirdre Curtin, Second order secrecy and Europe's legality mosaicism, 41 *West European Politics* (2018) 271.

[31] Federica Cacciatore and Mariolina Eliantonio, 'Networked Enforcement in the Common Fisheries Policy through Data Sharing: Is There Room Left for Traditional Accountability Paradigms?' (2019) 10 European Journal of Risk Regulation 522; Diana-Urania Galetta, 'Public Administration in the Era of Database and Information Exchange Networks: Empowering Administrative Power or Just Better Serving the Citizens?' (2019) 25 European Public Law 171.

approaches arose initially from mutual assistance requirements between European administrations,[32] which have, in many areas, evolved towards more integrated informational cooperation following requirements of a single legal space in the EU without internal frontiers.[33] For example, food and non-food mutual warning systems (RASSF or RAPEX)[34] also serve as large-scale storages of information. Such sharing works in two ways. Either information collection is undertaken in national database and shared in single shared database across the EU. In the alternative, single European database can be 'mirrored' on the national level.[35] An example for the latter is the technical architecture of the SIS, which relies on the national systems, the so-called N.SIS being connected to the centralized EU-level database. The N.SIS "might contain a complete or partial copy of the SIS database, which may be shared by two or more Member States".[36] Another example is the European Competition Network (ECN), which contains links between initially independent databases, the cooperation of which has evolved from mere mutual assistance obligations.

Third, many policy areas allow access by public bodies to privately held or collected data.[37] Travel, communications, banking and finance institutions face certain data retention obligations in order to allow for subsequent access of data by public

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[32] See the discussion of the evolution of EU administration in Chapter 1 of this book and in Herwig C.H. Hofmann, Mapping the European Administrative Space, 31 *West European Politics* [2008], 662-676.

[33] See e.g. such information exchange under the *Internal Market Information System* (IMI) systems ('About IMI-Net' https://ec.europa.eu/internal_market/imi-net/about/index_en.htm). Micaela Lottini, 'An Instrument of Intensified Informal Mutual Assistance: The Internal Market Information System (IMI) and the Protection of Personal Data' (2014) 20 European Public Law, 107. Simona Demková, The Decisional Value of Information in European Semi-Automated Decision Making, Review of European Administrative Law 2021 (forthcoming).

[34] European Commission, 'Safety Gate: The Rapid Alert System for Dangerous Non-Food Products' (*ec.europa.eu*), https://ec.europa.eu/consumers/consumers_safety/safety_products/rapex/alerts/repository/content/pages/rapex/i ndex_en.htm; European Commission, 'RASFF - Food and Feed Safety Alerts', https://ec.europa.eu/food/safety/rasff_en.

[35] This is not without danger for the integrity of EU database. A notorious recent example of the gravity of concerns arising from the unlawful copying of SIS data, is the UK's illegal copying of SIS data prior to Brexit, discovered through the evaluation visit conducted by the European Commission in 2017. See: 'UK-EU: Schengen Data Fiasco' (Statewatch, 7 August 2018) <https://www.statewatch.org/news/2018/august/statewatch-news-online-uk-eu-schengen-data-fiasco/> accessed 26 January 2021.

[36] Preamble (8) and Article 4(1)(b) and (c) of the SIS-recast. The conditions for any sharing of national copies shall be arranged among the Member States concerned and communicated to the Commission (Article 4(1)(c) SIS-recast). The data stored in the copies must be 'identical to and consistent with the SIS database' so that 'a search in national copy produces a result equivalent to that of a search in the SIS database' (Article 9(2) SIS-recast).

[37] Buying services – from geolocalisation to cloud storage and associated search services is not uncommon in various areas covering research, environment, farming, fishing and other fields.

authorities.[38] But increasingly EU policies also impose reporting obligations or the possibilities of regulatory agencies to demand provision of relevant information falling within the regulatory ambit of the agencies.[39] These reporting obligations allow for agencies to access information regarding the possible necessity for regulatory action by an agency and enforcement.[40] Further, beyond such 'push' and 'pull' approaches to privately held or generated data, wide-spread reporting duties of private entities allow for integrating private information flows to public decision making in the field of financial regulation. This is marked by an increasing integration of information provision by regulated entities and regulatory decision making by agencies in real time based on this information. The integration of information reporting by regulated entities and regulatory decision making by regulators are in line also with the deployment of advanced information technology – both information technology used by businesses as well as regulatory technology used by agencies.

Questions of accountability of ADM are complicated by the fact that the databases on which ADM relies are fed in multi-level legal systems and in some cases, the data collection activities are subject to the law of various Member State as well as EU law.[41] The composite aspect of regulation by information in the EU can influence the conditions of addressing regulatory standards in EU administrative law. Also, due to the principle of interoperability the cross-policy nature of databases can enhance these same problems, especially in the absence of a general administrative procedure law of the EU addressing, across policy areas, basic standards of administrative procedure. Imbedding the ADM technology within EU large scale databases aids multi-level, decentralized

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[38] See Joined Cases C-203/15 and C-698/15, Judgment of the Court (Grand Chamber) of 21 December 2016, Tele2 Sverige AB v Post- och telestyrelsen (C-203/15 : ECLI:EU:C:2016:970), Secretary of State for the Home Department v Tom Watson, Peter Brice, Geoffrey Lewis (C-698/15: ECLI:EU:C:2016:970). Joined Cases C-511/18, *La Quadrature du Net and Others*, C-512/18, *French Data Network and Others*, and C-520/18, *Ordre des barreaux francophones et germanophones and Others,* ADD FULL CITATION

[39] E.g. in the field of financial regulation see reporting duties established by ESMA and national financial regulators under provisions such as Articles 26a and 99e of Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014 amending Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards depositary functions, remuneration policies and sanctions Text with EEA relevance, OJ 2014 L 257/186.

[40] E.g. in the field of data protection, Article 49(1) third sentence GDPR requires that data controllers "shall inform the supervisory authority of the transfer" of data to a third country when acting under the criteria of Article 49 GDPR.

[41] See e.g. Lilla Farkas, 'Analysis and Comparative Review of Equality Data Collection Practices in the European Union: Data Collection in the Field of Ethnicity.' (European Commission, DG Justice and Consumers 2017) <http://op.europa.eu/en/publication-detail/-/publication/1dcc2e44-4370-11ea-b81b-01aa75ed71a1/language-nl> accessed 13 May 2021.

implementation of EU policies in the context of composite decision-making within administrative networks providing, for example, for information exchange, joint warning systems and structures of coordinated remedies.

The composite approach to data collections and the interoperability paradigm also raise challenges concerning the quality and accuracy of data input into decision making – which has in turn effects on accountability in ADM procedures based on such data.[42] In view of this being possibly one of the most crucial aspects of the possibility of successful use of ADM and at the same time a topic of high concern for the exercise of individual rights, the use of ADM requires supervision of the quality of data-input.[43] The latter concern of quality control is also of extraordinary relevance due to the links between public and private data collections used as basis for ADM in some policy areas. Information quality is not just a matter of maintaining up to date and correct data in public databases but also a control of information imported from or accessed from private actors. Raising some of these conditions, Article 10 of the Commission's draft AI Act directs data and data

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[42] E.g. Articles 17, 18 EDPR requires that data must be correct and up-to-date. This requires access to data, and its possible rectification are key in this context. Unauthorized or unlawful processing as well as (accidental) loss must be avoided. Data should not be accessible by non-authorised parties be they internal to an organisation or external. This is a requirement under the principle of data security also codified in data protection legislation. For case law see also Opinion 1/15 (*EU-Canada PNR Agreement*) of 26 July 2017, EU:C:2017:592, para 172: "Similarly, it should be stated that the databases with which the PNR data is cross-checked must be reliable, up to date and limited to databases used by Canada in relation to the fight against terrorism and serious transnational crime." Although this CJEU statement in Opinion 1/15 relates predominantly to Canadian data cross referenced to EU PNR data, this is a clear statement regarding the necessity of upholding data quality.

[43] See e.g. European Agency for the Operational Management of Large Scale IT Systems in the Area of Freedom, Security and Justice., *Data Quality and Interoperability: Addressing the Capability Gaps through Standardisation : Eu LISA 12th Industry Roundtable, 3 5 November 2020, Tallinn (Online Event).* (Publications Office of the EU 2020) <https://data.europa.eu/doi/10.2857/497949> accessed 29 March 2021; European Union Agency for Fundamental Rights, *Data Quality and Artificial Intelligence – Mitigating Bias and Error to Protect Fundamental Rights* (Publications Office of the EU 2019) <https://fra.europa.eu/en/publication/2019/data-quality-and-artificial-intelligence-mitigating-bias-and-error-protect>. See also the EU efforts in standardising the data quality requirements, for instance, in the context of biometric data collection and storing in EU AFSJ systems. Commission Implementing Decision (EU) 2020/2165 of 9 December 2020 on laying down rules for the application of Regulation (EU) 2018/1861 of the European Parliament and of the Council as regards the minimum data quality standards and technical specifications for entering photographs and dactyloscopic data in the Schengen Information System (SIS) in the field of border checks and return, OJ L 431/61, Brussels, 21.12.2020 and Commission Implementing Decision (EU) 2021/31 of 13 January 2021 on laying down rules for the application of Regulation (EU) 2018/1862 as regards the minimum data quality standards and technical specifications for entering photographs and dactyloscopic data in the [SIS] in the field of police cooperation and judicial cooperation in criminal matters, *OJ* L 15/1, Brussels, 18.1.2021.

governance in what the draft refers to as "high-risk AI systems".[44] Data sets must meet certain quality criteria including under Article 10(3) AI Act "shall be relevant, representative, free of errors and complete" and shall have "the appropriate statical properties".

4.   ADM interface with human decision making

Discussing ADM tools must also address the interface between human action and information technology in decision making and rule-making procedures. The use of ADM systems in different phases of decision-making procedures underlines that there are interactions between various ADM systems or different admixtures of human input into decision-making procedures and elements of ADM. Boundaries between human and automated decision-making are thus not always clear.[45] In real-life, ADM systems are generally but one tool among several to be relied on by a human decision-maker, who ultimately may bring their judgement to make the final decision themselves.[46] The integration of ADM into decision making procedures could in most cases be described as augmented decision making or as "quasi- or semi-automated decision-making".[47] This results in factual changes to conditions of decision making, which in turn have to be understood from a normative point of view.

a) Quantity and quality of data processing and data biases

In assessing the human-machine interface in the context of semi-automated decision making with ADM technology, it is worth understanding the effects of the integration of ADM technologies into the decision-making process. The actual effect of the use of ADM impacts the *quantity* of information and *speed* by which information can be

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[44] European Commission, Proposal for a Regulation of the EP and the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) of 21.4.2021, COM(2021) 206 final, 2021/0106 (COD).

[45] AlgorithmWatch, Automating Society: Taking Stock of Automated Decision Making in the EU (AlgorithmWatch, in cooperation with Bertelsmann Stiftung, supported by the Open Society Foundations 2019) 9 https://www.ivir.nl/publicaties/download/Automating_Society_Report_2019.pdf.

[46] Jennifer Cobbe, Administrative Law and the Machines of Government: Judicial Review of Automated Public-Sector Decision-Making (2019) 39 *Legal Studies* 636-638; Jean-Bernard Auby, *Le droit administratif face aux défis du numérique: AJDA (Actualité Juridique Droit Administratif)* 2018, 835.

[47] Council of Europe, Algorithms and Human Rights: Study on the Human Rights Dimensions of Automated Data Processing Techniques and Possible Regulatory Implications' (The Committee of Experts on Internet Intermediaries (MSI-NET) 2018) 7. Simona Demková, The Decisional Value of Information in European Semi-Automated Decision Making, Review of European Administrative Law 2021 (forthcoming).

processed (quantitative effects) and the quality and depth by which information can be analysed (qualitative effects).

The *quantitative* effects consist primarily in increasing the volume of information that can be incorporated into decision-making and rule-making procedures. This consists in extracting greater amounts of relevant information from EU-wide databases and combine various data sets across sources than a human could undertake on his/her own. This approach is particularly useful in areas in where fast-paced decision-making is central - like monetary policy, banking, and finance supervision, where real-time market data may be essential for the capability of reacting to and influencing of market conditions by regulatory means.

Qualitative effects arise from the use of ADM systems. This is for example by way of simple possibilities of comparing data sets e.g. in the context of the analysis of biometric data and matching of information which would not have been possible for human analysis. But also, the qualitative change becomes clear where algorithms are programmed to improve search results by drawing comparisons between current analytical results and prior analytical results, making decisions built on probabilities based on statistical comparisons. Algorithms, therefore, calculate outcomes based on factual correlations on the basis of data collected in the past and will not necessarily be programmed in a way to include normative orientations or justifications or programmatic reasons when taking a specific decision. [48]

These effects allow to make decision-making procedures faster and more data-reliant than human-only analysis of databases. Under EU law there is a legal requirement to use facts where possible in decision making. Under the EU's duty of care principle, where data is necessary and sufficient quality of data is available, decision making must make use of such data,[49] and arguably, use available ADM technology to analyze it. This is linked to the principle of proportionality, which will require that decision making, in order to take into account relevant facts, make use of available data driven possibilities in decision making.[50]

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[48] Jean-Bernard Auby, Le droit administratif face aux défis du numérique (2018) *AJDA*, 835 with further references also to Dominique Cardon, *À quoi rêvent les algorithmes. Nos vies à l'heure des big data*, Paris, Le Seuil, 2015, 39.

[49] Jean-Bernard Auby, Le droit administratif face aux défis du numérique (2018) *AJDA*, 835 with further references also to Dominique Cardon, *À quoi rêvent les algorithmes. Nos vies à l'heure des big data*, Paris, Le Seuil, 2015, 39.

[50] For example, where individuals have a right of access to documents (Article 42 CFR and Regulation 1049/2001), restrictions of such right of access must be proportionate. Where document management software can be applied to reduce the burden of analysis of existing data, this might reduce the possibility

However, when using such data, these cannot be understood to be an entirely neutral basis of decision-making. They are generally collected with a certain purpose and organized according to certain criteria. Furthermore, research in political science and sociology alerts to the fact that the interaction between humans and ADM in decision-making may be subject to certain biases.[51] Literature on ADM-human interaction reports, for example, on the human side, so called 'automation bias'.[52] This might have an effect especially in the context of discretionary decision-making, when the exercise of discretion is influenced by input based on an ADM system.[53] ADM technologies thereby not only inform human decision making and improve it by allowing to take into account more data, but it may also shape, constrain, or remove human discretion by structuring information intake. Automation bias may lead, possibly, to rigidity in decision making and "unproductive shirking of responsibility".[54]

Data collections, on which ADM technology is based, might equally suffer from biases. These are frequently referred to with the terms of "sample bias, feature bias and label bias."[55] '*Sample bias*' arises from data used by an ADM system to train software algorithms. If training data used has certain inbuilt biases the outcome of computer-based calculations can reflect or even accentuate that same bias.[56] '*Feature bias*' is particularly problematic in interoperative or composite data basis and relates to different labelling or categorization of data across the data samples used by ADM systems. A particular feature assigned to the data might translate into systematically erroneous outcome in other contexts. Errors can consist of mislabeling data or arise from simple differences in categorization of

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of an administration's justification for restrictions of access since screening of documents for relevant information or for business secrets that need to be protected can be automatized.

[51] It is unclear whether the biases of humans are temporary findings, which can change over time with ever more ADM technologies being rolled out, or whether these findings as to human biases are long-term structural features. In any case, when designing systems which necessarily link humans to ADM technology such findings should be taken into account.

[52] Karen Yeung, 'Why Worry about Decision-Making by Machine', in: Karen Yeung, Martin Lodge (eds.), Algorithmic Regulation, Oxford University Press (Oxford 2019), 21-48, at 25 with reference to LJ Sktika, K Moiser, MD Burdick, 'Accountability and Automation Bias, 52 International Journal of Human-Computer Studies (2000), 701-717.

[53] Simona Demková, The Decisional Value of Information in European Semi-Automated Decision Making, Review of European Administrative Law 2021 (forthcoming), section 3.1.

[54] Matthew Smith, Merel Noorman and Aaron Martin, 'Automating the Public Sector and Organizing Accountabilities' (2010) 26 Communications of the Association for Information Systems 7 https://aisel.aisnet.org/cais/vol26/iss1/1, 4.

[55] Aziz Z.Huq, Constitutional Rights in the Machine Learning State, SSRN.Com/abstract=3613282, 34.

[56] For example, if hiring data shows that in the past predominantly men had been employed, a ADM system trained on such data of a potentially successful candidate might exclude certain categories of women. The normative requirement of ensuring gender equality and the acceptance of different biographies might not be best left to a machine learning system.

certain data points. Finally, '*label bias*' may arise if a variable contains too many elements each having an effect on output.[57] Together the biases result in poor quality input data and therefore faulty data processing, which in itself might disqualify an entire ADM system.

b) Integration of ADM in decision-making phases

ADM systems are to date only very rarely established to undertake entire phases of an administrative procedure. Normally, they provide input into further human-based decision making. Often introduced as a means of processing of information within large-scale databases, the real-life effects, and the possible biases of ADM technology's reliance on data collections is particularly relevant in case of discretionary decisions. Where the use of ADM technologies within a phase of a decision-making procedure, would therefore *de facto* or *de jure* limit discretion of a human decision-maker in a later phase of a decision making procedure?[58] For example, when used for establishing predictions in risk assessment procedures, such as food safety, ADM could lead to the conclusion that specific acts of control and possibly enforcement would be necessary. Such predictions might limit both a discretion concerning the assessment whether or not to act. Such predictions might equally – in view of the duty of care – create an obligation to react to the automated risk assessment.[59] This example illustrates how the use of ADM in early phases of decision making, such as the phase of agenda setting or investigation, might have effects in subsequent phases of decision-making.

However, using predictions in normative decision-making is not unheard of in legal thinking and human decision-making. Examples exist in areas of risk regulation where the precautionary principle requires predictions of how high the likelihood of a risk is and how high the possible damage – irrespective of the degree of human or machine decision-making involved.

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[57] For example, if the question of the number of publications is seen as a variable for academic performance, taking into account publications by multiple authors, book and article publications, edited books and monographies, each with the same value, might lead to problems in the value of data.

[58] Maja Brkan, Do algorithms rule the world? Algorithmic decision-making and data Protection in the framework of the GDPR and beyond, 27 *International Journal of Law and Information Technology* (2019) 91-121, 105. The author finds that 'at least theoretically, a legal possibility of fully automated decisions is still a matter of the future,' yet reminds that in practice often decisions are increasingly fully automated. See in this respect the "human in the loop" as a minimum safeguard under Article 22 against decision-making based solely on automated processing of personal data in the GDPR context.

[59] This would affect the discretionary decision whether to act – be it for investigative purposes or the purpose of taking a final binding decision (in German this is referred to with the more specific term of *Entschliessungsermessen*) see: Yoan Hermstrüwer, Artificial Intelligence and Administrative Decisions under Uncertainty, in: Thomas Wischmeyer, Timo Rademacher (eds.), *Regulating Artificial Intelligence,* (Springer,Cham 2020), 200-221, 215.

Cyber-delegation and autonomy of ADM systems

Growing autonomy of ADM technology within decision-making procedures would indicate a transformation of ADM from being a 'tool' to becoming an 'agent'. Such step would be reached when the outcomes of procedures predominantly relying on ADM are, in principle, binding. No meaningful human input would be necessary to adopt binding decisions. This state has been referred to in the literature as cyber-delegation.[60] Delegation-based theories of accountability, especially principle-agent models focusing on problems of information asymmetries, have informed delegation of powers approaches in EU public law and might offer particularly pertinent guiding principles for assessing the legality of ADM technology roll-out in EU decision making. Notions of delegation might thus add a conceptual lens for assessing accountability of ADM systems.[61]

1.   Substantive criteria

Substantive limits to delegation are most explicitly established for rule-making procedures. Substantive limits to delegation of powers are for example formulated in Article 290 TFEU reserving to the legislature certain elements of decision making such as the "objectives, content, scope and duration of the delegation". Delegating the "essential elements of an area" is not permitted.

The latter term is linked to limits to delegation of powers to ADM technology where decisions concerning the exercise of fundamental rights are concerned. Article 52(1) CFR requires that any limitation on the exercise of the rights and freedoms to "be provided for by law" and, be defined therein.[62] 'Law' in this sense is legal code derived from pre-defined decision-making procedures in conformity with legislative procedures. In EU law, this comes in forms recognized under Article 288 TFEU. Any limitations of fundamental

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[60] Garry Coglianese, David Lehr, Regulating by Robot: Administrative Decision Making in the Machine-Learning Era, 105 The Georgetown Law Journal (2017) 1147-1223, at pp. 1179-83.

[61] Tobias D. Kraft, Katharina A. Zweig, Pascal D. König, How to regulate algorithmic decision-making: A framework of regulatory requirements for different applications, 2020 Regulation and Governance (doi:10.1111/rego.12369), 14.

[62] The notion of a limitation of a fundamental right is broad. It pertains to limitations of the exercise of rights due to public policy concerns but also due to balancing of various rights. It also pertains to rights and freedoms protected as general principles of EU law, to which, under the CJEU's ERT case law, the same criteria of limitation arise as to fundamental rights.

rights which might result from the application of computer-code based ADM-systems must therefore be pre-determined by in what is recognizable as law under Article 52(1) CFR. The notion of 'law' is conceptually linked to its accessibility. Individuals must be able to discern from freely available and officially published texts which limitations to their rights and freedoms they might be asked to endure. Although an ADM-system itself, identifying criteria for the implementation of a legislative act towards individual decision-making, might de-facto have the effect of executive rulemaking, it will not qualify as 'law' under Article 52(1) CFR. Computer code, well hidden in sometimes proprietary software, is interpretable, if at all, only to experts trained in specific specialist areas of computer science. It does not comply with the requirements of accessibility and intelligibility associated with the notion of law in Article 52(1) CFR.

These limits to delegation must be kept in mind especially in the context of machine learning technology, which may amend the criteria of decision-making in a dynamic fashion by adjusting future output to results of past calculations. Accordingly, in the context of limitations of the right to the protection of privacy and personal data (Articles 7 and 8 CFR), the CJEU has requested that

> "the requirement that any limitation on the exercise of fundamental rights must be provided for by law implies that the legal basis which permits the interference with those rights must itself define the scope of the limitation on the exercise of the right concerned.[…] In order to satisfy that requirement, the legislation in question which entails the interference must lay down clear and precise rules governing the scope and application of the measure in question and imposing minimum safeguards…"[63]

The CJEU does not request any specific type of law but a legislative act to undertake the clear and predictable limitations of fundamental rights. The notion of 'minimum safeguards' refers to the realisation of procedural principles, the notion of the 'scope of application' refers to the degree and extent of ADM possibilities in data processing. The court continued in finding that the extent of the interference with fundamental rights by automated analyses of data, "essentially depends on the pre-established models and criteria and on the databases on which that type of data processing is based."[64] The Court requests that such "pre-established models and criteria (…) should be specific and

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[63] Opinion 1/15 (*EU-Canada PNR Agreement*) of 26 July 2017, EU:C:2017:592, paras 139-141.
[64] Opinion 1/15 (*EU-Canada PNR Agreement*) of 26 July 2017, EU:C:2017:592, para 172.

reliable."[65] That means that the normative legal programming of limitations must be represented in the computer programming code underlying ADM systems. Any machine-learning based systems must be able to demonstrate how they specifically and reliably comply with the pre-established models defined in the legal basis.[66]

Problems arise with some machine-learning ADM technology, designed to find solutions rather than containing pre-designed steps to do so, since the latter are not always *ex ante* predictable in their output calculations. But the very idea of machine learning "to identify and, if necessary, automatically refine (or prompt refinement of) the system's operations to attain a pre-specified goal",[67] needs to be carefully linked to normative programming. Where, machine learning is based on advanced statistical methods to pick out patterns and correlations to infer from the data analysed complex, nonlinear relationships that they were not specifically programmed to find, this must take place in a normatively pre-defined framework of possible considerations.

2. Procedural requirements

A statement by the CJEU regarding the obligation to control and regularly submit ADM technology to a review indicates which obligations exist for administrations in this scenario.

Principles include such requirements as compliance with the principle of transparency. Transparency is a systemic requirement regarding the features of the computer programming.[68] In cases of ADM this *de facto* may play the role of administrative rulemaking. There, transparency is a question of explainability of the basic functioning and functionalities of a computer programme used for ADM.[69]

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[65] Opinion 1/15 (*EU-Canada PNR Agreement*) of 26 July 2017, EU:C:2017:592, para 172.

[66] These requirements exist irrespective of which legal basis a delegation is based on. After all, delegation of rule-making powers to the Commission must be based on Articles 290 or 291 TFEU, whereas the most common legal basis for delegation of rule-making powers to agencies is Article 114 TFEU allowing for the empowerment to adopt 'measures' for harmonisation of the single market.

[67] K. Yeung, *TLI think!* Paper 62/2017, p. 1 (SSRN abstract=2972505), abstract.

[68] Bruno Lepri and others, 'Fair, Transparent, and Accountable Algorithmic Decision-Making Processes' (2018) 31 *Philosophy & Technology* 611; Daniel Innerarity, 'Making the Black Box Society Transparent' [2021] AI & SOCIETY <https://doi.org/10.1007/s00146-020-01130-8> accessed 21 April 2021.

[69] For an overview of the diverse approaches to the requirement of transparency in ADM see e.g. Deven R Desai and Joshua A Kroll, 'Trust but Verify: A Guide to Algorithms and the Law' (2017) 31 *Harvard Journal of Law & Technology* 1; Tobias D Krafft, Katharina A Zweig and Pascal D König, 'How to Regulate Algorithmic Decision-Making: A Framework of Regulatory Requirements for Different Applications' [2020] *Regulation & Governance* 18.

Transparency must be ensured both with respect to the access and use of data as well as its processing in the ADM system. Factors necessary for transparency therefore include the sources of input of information for decision making to be used by the ADM programme and the criteria used for weighting and balancing of such input taken into account in a decision-making procedure. The procedural steps and phases that the ADM programme is designed to assist or replace shall illustrate the chosen criteria for decision-making.

Transparency is also necessary regarding the responsibility of different actors. This is necessary in the context of the human-machine interaction in cases of semi-automated decision making. It is also necessary for questions of the distribution of responsibility in joint or composite multi-jurisdictional decision-making procedures. Just like in purely human decision-making, transparency is thus a pre-requisite for allocation of responsibilities and thus of accountability mechanisms.

This form of upfront transparency can be supported by systemic quality checks through "conformity assessment procedures". This is a requirement under the Commission's draft AI Act for putting a high-risk AI system into service.[70] On this basis, transparency requirements must also make continuous monitoring of the working of such programmes possible in order to take corrective actions where necessary.[71]

The CJEU already has developed this request for continuous oversight over the workings of the ADM system. This is in line with requests for continuous control in the context of delegation of powers. For example, in *La Quadrature du Net* the CJEU stated that in order to ensure that, in practice, ADM technology (in the form of "pre-established models and criteria") and the "databases used" comply with the conditions under which fundamental rights may be limited (Article 52(1) CFR), "a regular re-examination should be undertaken to ensure that those pre-established models and criteria and the databases used are reliable and up to date."[72]

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[70] Articles 19, 43 of European Commission, Proposal for a Regulation of the EP and the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) of 21.4.2021, COM(2021) 206 final, 2021/0106 (COD).

[71] Article 21 of European Commission, Proposal for a Regulation of the EP and the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) of 21.4.2021, COM(2021) 206 final, 2021/0106 (COD).

[72] Judgement of the Court (Grand Chamber) of 6 October 2020: C-511-520/18 *La Quadrature du Net* ECLI:EU:C:2020:791, para 182 with reference to Opinion 1/15 (*EU-Canada PNR Agreement*) of 26 July 2017, EU:C:2017:592, paras 173, 174.

This is in line with the limitations to delegation which arise from the CJEU's delegation doctrine based on principles listed and discussed in *Meroni* – a case concerning delegation of powers to a legal person created outside of EU law. In this context, ADM technology acting within the limits set by law must be programmed to ensure that delegation of powers is subject to administrative review and that it allows for independent judicial review (see Article 47(1) CFR). In *La Quadrature du Net* and without mentioning criteria of delegation, the CJEU built its approach on reviewability and held that

> "it is essential that the decision authorising automated analysis be subject to effective review, either by a court or by an independent administrative body whose decision is binding, the aim of that review being to verify that a situation justifying that measure exists and that the conditions and safeguards that must be laid down are observed."[73]

3. Private data collections and proprietary software

Meroni criteria have particular weight in this context. The reason is that the original facts underlying *Meroni* concerned sub-delegation by the ECSC's High Authority to private parties. De facto ADM-systems are often based on private input. This results from using ADM technology supporting public decision making of data sourced and computed from private data collections. It also results from the frequent use of private proprietary software in ADM, which could be considered as a form of *de-facto* delegation of powers to external actors if there is no strong oversight and control of the details of programming.

The basic limits to sub-delegation to private parties have to be complied with. Although delegation of rule-making powers to private parties is generally possible, e.g. in the field of standardisation, such delegation needs very careful circumscription when private parties are given responsibilities in matters relevant to fundamental rights. Private parties are expected to develop regulatory tools for supervision and enforcement of certain EU instructed objectives such as IP protection or the fight against certain illegal content online. The regulatory technology applied being in the hands of private entities, challenges arise concerning decision making balancing individual rights and establishing proper standards and possibilities of review.[74]

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[73] Judgement of the Court (Grand Chamber) of 6 October 2020: C-511-520/18 *La Quadrature du Net* ECLI:EU:C:2020:79, para 179.

[74] For example, see Article 17(4) of Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC, OJ 2019 L 130/92 under which "online content-sharing service

4. Cyber delegation and composite procedures

In summary, the conditions of 'cyber-delegation' especially in the context of rising autonomy of ADM systems are developing from EU delegation doctrines. CJEU case law has begun to specify these conditions. Cyber-delegation occurs where ADM gains in autonomy especially in cases with reduced human input into decision-making or in cases where ADM takes over several decision-making phases. This is the moment where ADM evolves from a mere 'tool' supporting agency or institution in decision-making, to becoming more of an 'actor'.[75]

Several factors complicate this process. One is managing the various interfaces in composite procedures – i.e. between human and ADM technology as well as their interactions on Member State and EU levels.

ADM technology intervenes in various phases of composite decision-making procedures implementing EU law. ADM might be used to link various actors through granting access and processing data from large scale databases. In composite procedures, questions of accountability are often linked to the identification of responsibility,[76] which then may define the steps of decision-making procedures, including which actor takes a decision, whether individual steps in a composite procedure could be identified as changing the legal position of individuals and who should be obliged to remedy a potential violation. Also, in composite procedures, the question arises whether there should there be a difference between, on the one hand, a body responsible towards outsiders such as individuals affected by an administrative action, and, on the other hand, the distribution of responsibilities amongst actors within a network. The issue is therefore also a question of the locus of decision-making.[77]

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providers shall be liable for unauthorised acts of communication to the public, including making available to the public, of copyright-protected works". Internet service providers facing such potential liability undertake searches for IP protected content by ADM systems, thereby potentially affecting artistic freedoms, freedom of expression and other individual rights. Questions about the legality of Article 17 are currently pending before the CJEU.

[75] See also Simona Demková, The Decisional Value of Information in European Semi-Automated Decision Making, Review of European Administrative Law 2021 (forthcoming).

[76] Simona Demková and Teresa Quintel, 'Allocation of Responsibilities in Interoperable Information Exchanges: Effective Review Compromised?' (2020) 1 Cahiers Jean Monnet 589.

[77] Paul Craig, Herwig C.H. Hofmann, Jens-Peter Schneider, Jacques Ziller, *ReNEUAL Model Rules on EU Administrative Procedure* Oxford University Press (Oxford, 2017), Book VI.

A second factor is that of guaranteeing normative steering of decision-making processes - i.e. of ensuring that rights, principles, and values of EU public law are complied with also in procedures using ADM systems. This is a question of ensuring values of democracy and the allocation of powers to various institutional actors. It is also a question of how the limitation of fundamental rights is conducted and what the share of 'law' is in the decision as to limitations of rights.

A third factor is inextricably linked to considerations of accountability in principle-agent models. It has been argued that informational asymmetries make the control essentially impossible "if the logic underpinning a machine-generated decision is based on dynamic learning processes employed by various forms of machine learning algorithms."[78] The reason for the impediment of meaningful human oversight and intervention then results from the "major informational advantages" the machine has over a human operator.[79] This is particularly relevant in the discussion of possibilities of human oversight and review below.

Finally, a fourth factor concerns the link between ADM and databases. The Research Network of European Administrative Law (ReNEUAL) Book VI considers the identification of responsibility for EU information networks.[80] Therein it is suggested that the issues of responsibility for multi-jurisdictional nature of data collections should be clarified. This, it is suggested, might be best addressed by offering a single European level body. That EU body could be co-responsible together with the national body, which has entered the information (and thus is responsible as the author of that information) for the quality of information in a data basis. In EU law, there are some examples of certain management powers over an information network centralized in the hands of a European agency. In the European energy regulators network,[81] for example, an EU agency is in

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[78] Karen Yeung, 'Why Worry about Decision-Making by Machine?' in: Karen Yeung and Martin Lodge (eds), *Algorithmic Regulation* (Oxford, Oxford University Press: 2019) 41 (https://www-oxfordscholarship-com.eui.idm.oclc.org/view/10.1093/oso/9780198838494.001.0001/oso-9780198838494-chapter-2) 24; Emre Bayamlioglu, Contesting Automated Decisions: A View of Transparency Implications (2018) *European Data Protection Law Review,* 434.

[79] Karen Yeung, 'Why Worry about Decision-Making by Machine?' in: Karen Yeung and Martin Lodge (eds), *Algorithmic Regulation* (Oxford, Oxford University Press: 2019) 41 (https://www-oxfordscholarship-com.eui.idm.oclc.org/view/10.1093/oso/9780198838494.001.0001/oso-9780198838494-chapter-2) 24; Emre Bayamlioglu, Contesting Automated Decisions: A View of Transparency Implications (2018) *European Data Protection Law Review,* 434.

[80] Paul Craig, Herwig C.H. Hofmann, Jens-Peter Schneider, Jacques Ziller, *ReNEUAL Model Rules on EU Administrative Procedure* Oxford University Press (Oxford, 2017), Book VI.

[81] Regulation (EC) n. 713/2009 of the European Parliament and of the Council, of 13 July 2009, establishing an Agency for the cooperation of Energy Regulators (OJ L 211, 14.8.2009, p. 1).

charge of establishing a cooperative network of national regulatory agencies and is in charge also of maintaining a joint data base on the topic. The same approach could be suggested for addressing the accountability of ADM built around data bases.

EU rights and principles in ADM accountability

Procedural changes due to that integration of ADM technology into decision-making requires specific attention to substantive as well as procedural rights and principles. Criteria for accountability of ADM and means for the protection of individual rights in their use must differentiate between, on one hand, the *systemic* questions of the design of the ADM procedures, and, on the other hand, questions of *individual* decision-making procedures.[82] This reflects the role of ADM systems to pre-define decision-making in a way similar to administrative rule making procedures.[83] The distinction between the systemic and the individual decision making levels is also the basis of the following discussion.

1.   System-level accountability of ADM

The CJEU requires that ADM be conducted on the basis of systemic rules in the form of "…pre-established models and criteria…"[84] which ensure compliance of ADM with EU law's basic rules and principles. Some of the central principles, generally touched by ADM systems are discussed below.

a) Privacy and data protection in ADM

The right to privacy and data protection (Articles 7 and 8 CFR) is amongst the most frequently affected individual rights in the context of the use of ADM technology in public decision making.[85] ADM relies on the use of data, often collected and stored within

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[82] Matthew Smith, Merel Noorman, Aaron Martin, Automating the Public Sector and Organizing Accountabilities, 26 Communications of the Association for Information Systems (2010) 1-16, 10.

[83] Karen Yeung, 'Why Worry about Decision-Making by Machine?' in Karen Yeung and Martin Lodge (eds), *Algorithmic Regulation* (1st edn, Oxford University Press 2019) 41.

[84] Opinion 1/15 (*EU-Canada PNR Agreement*) of 26 July 2017, EU:C:2017:592, para 172.

[85] See e.g. Lee A Bygrave, 'Minding the Machine v2.0: The EU General Data Protection Regulation and Automated Decision-Making' in Karen Yeung and Martin Lodge (eds), *Algorithmic Regulation* (1st edn,

large-scale databases. Any processing of personal data is regarded to be a limitation of these rights and thus requires a clear legal basis (Article 52(1) CFR). Accordingly, Article 5(1) GDPR and Article 4(1)(a) EDPR[86] require that a public body have a legal basis for the processing of data involved in decision-making, in order to comply with the obligation to process data lawfully, fairly, and transparently. Data subjects have a right to object to processing in violation of such pre-conditions.[87] Access to data collections by ADM, which is one of many forms of processing, must evidently be designed to be compatible with fundamental rights, including rights to privacy and data protection (Articles 7 and 8 CFR) and the rules on their limitations.

The CJEU has acknowledged that the use of ADM technology can de facto intensify limitations to the right to privacy and the protection of personal data.[88] For example, according to the CJEU, automated searching and processing of databases may lead to "particularly serious interference constituted by the automated analysis" of data.[89] The extent of such interference "depends on the pre-established models and criteria and on the databases on which that type of data processing is based."[90] This, systemic, rule-making aspect of ADM systems defines the possible limitations, balancing of one right against another and conditions of proportionality of such limits.

Further, in case of ADM involving personal data, the GDPR and the EDPR oblige the data controller to provide the data subject with "meaningful information about the logic involved, as well as the significance and the envisaged consequences of" ADM - regardless of whether the data was provided by or collected from data subject or was brought to decision making from a pre-existing data base.[91] These requirements are information which must be provided regarding the 'system' of data processing.

Oxford University Press 2019) <https://www-oxfordscholarship-com.eui.idm.oclc.org/view/10.1093/oso/9780198838494.001.0001/oso-9780198838494-chapter-11> accessed 10 March 2020.

[86] Article 4(1)(a) of Regulation 2018/1725 of the European Parliament and the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC, OJ 2018 L 295/39 states: "Personal data shall be processed lawfully, fairly and in a transparent manner in relation to the data subject ('lawfulness, fairness and transparency')".

[87] Jennifer Cobbe, Administrative Law and the Machines of Government 39 *Legal Studies* (2019) 636-655, 645.

[88] See also European Union Agency for Fundamental Rights (n 48).

[89] Judgement of the Court (Grand Chamber) of 6 October 2020: C-511-520/18 *La Quadrature du Net* ECLI:EU:C:2020:791, para 177.

[90] Opinion 1/15 (*EU-Canada PNR Agreement*) of 26 July 2017, EU:C:2017:592, para 172.

[91] Articles 13(2)(f), 14(2)(g) and 15 GDPR.

b) Non-discrimination and ADM

The use of ADM technology also frequently raises questions of non-discrimination.[92] In analysing data, ADM technology may rely on programming which results in groups of individuals becoming divided "into different categories based on common characteristics in order to base decisions on their belonging to a specific group."[93] Where that is the case, ADM technology is, by its very nature introducing distinctions, prone to risks of discrimination.[94] This might result from biased training data in machine learning and the analysis of situations by unsupervised learning technologies. ADM technology might then focus on decision-making criteria using distinctions, which might be unacceptable under legal anti-discrimination provisions. Technology cannot claim a scope of innocence in matters as socially delicate as discrimination and the fight against it.

Article 21 CFR lists a set of criteria which cannot, in principle, be used for distinguishing one group from another. This includes criteria of "sex, race, colour, ethnic or social origin, genetic features, language, religion or belief, political or any other opinion, membership of a national minority, property, birth, disability, age or sexual orientation" (Article 21(1) CFR) as well as criteria of nationality of an EU member state (Article 21(2) CFR).

ADM must be programmed to not use these criteria as distinguishing factors, unless this is – as limitation of the right to non-discrimination - provided for by law, respects the essence of the right and the limitation is proportionate (Article 52(1) CFR). This also

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[92] See e.g., Bart Herman Maria Custers (ed), *Discrimination and Privacy in the Information Society: Data Mining and Profiling in Large Databases* (Springer 2013); Toon Calders and Indrė Žliobaitė, Why Unbiased Computational Processes Can Lead to Discriminative Decision Procedures, in: Bart Custers and others (eds), *Discrimination and Privacy in the Information Society: Data Mining and Profiling in Large Databases* (Springer Berlin Heidelberg 2013); Bart Schermer, 'Risks of Profiling and the Limits of Data Protection Law' in Bart Custers and others (eds), *Discrimination and Privacy in the Information Society: Data Mining and Profiling in Large Databases* (Springer Berlin Heidelberg 2013); Bettina Berendt and Sören Preibusch, Better Decision Support through Exploratory Discrimination-Aware Data Mining: Foundations and Empirical Evidence 22 *Artificial Intelligence and Law* (2014)175; European Union Agency for Fundamental Rights, *#BigData: Discrimination in Data-Supported Decision Making* (Publications Office of the EU 2018) <https://fra.europa.eu/sites/default/files/fra_uploads/fra-2018-focus-big-data_en.pdf>.

[93] Giovanni De Gregorio, Sofia Ranchordas, Breaking down Information Silos with Big Data: A Legal Analysis of Data Sharing, in Joe Cannataci, Valeria Falce and Oresto Pollicino (eds.), *Legal Challenges of Big Data* (Edward Elgar Cheltenham 2020) 226.

[94] Maja Brkan, Do algorithms rule the world? Algorithmic decision-making and data Protection in the framework of the GDPR and beyond, 27 *International Journal of Law and Information Technology* (2019) 91-121, 118.

holds true for ADM built on AI programming, either through machine learning or by so called unsupervised learning and pattern recognition. One of the challenges in programming of ADM is therefore that discrimination might occur also from the data-bases on which the searches are based. These databases, whether used as training data or as search data, may display biases which may translate to the decision making undertaken with the help of ADM systems.[95] The risk here is that the use of AI might actually reinforce and accentuate pre-existing biases within the data sets.[96] Therefore, the CJEU has held that ADM must be programmed to ensure that certain categories of data will not be used to determine the outcome of decision making:

> "[A]ny automated analysis carried out on the basis of models and criteria founded on the premise that racial or ethnic origin, political opinions, religious or philosophical beliefs, trade-union membership, or information about a person's health or sex life could, in themselves and regardless of the individual conduct of that person, be relevant … would infringe the rights guaranteed in Articles 7 and 8 of the Charter, read in conjunction with Article 21 thereof."[97]

Accordingly, sensitive personal data should not be made a required 'input variables' relevant for decision-making.[98] For AI technology, which might not be entirely predictable, therefore the reporting of decision making might be a very important

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[95] See above on the discussion of biases within this chapter. Further: Tal Zarsky, The Trouble with Algorithmic Decisions: An Analytic Road Map to Examine Efficiency and Fairness in Automated and Opaque Decision Making, 41 *Science, Technology, & Human Values* (2016), 126; Aziz Z.Huq, Constitutional Rights in the Machine Learning State, SSRN.Com/abstract=3613282.

[96] Bryce Goodman, Discrimination, Data Sanitisation and Auditing in the European Union's General Data Protection Regulation, 2 *European Data Protection Law Review* (2016), 498

[97] Judgement of the Court (Grand Chamber) of 6 October 2020: C-511-520/18 *La Quadrature du Net* ECLI:EU:C:2020:791, para 181. This further states that "pre-established models and criteria for the purposes of an automated analysis that has as its objective the prevention of terrorist activities that constitute a serious threat to national security cannot be based on that sensitive data in isolation" with reference to Opinion 1/15 (*EU-Canada PNR Agreement*) of 26 July 2017, EU:C:2017:592, para 165.

[98] Indre Zliobaite, Bart Custers, Using Sensitive Personal Data may be Necessary for Avoiding Discrimination in Data-driven Decision Models, 24 *Artificial Intelligence and Law* (2016) 183–201.

feature.⁹⁹ This is the reason for the CJEU requiring not just oversight of programming but also "regular re-examination" of the output of such programming.¹⁰⁰

c) *Review of pre-established models and criteria*

A key feature of the integration of ADM technologies in various phases of decision-making is that it has a profound effect on *procedures* leading to the delivery of public policies in the EU. This has the potential to improve decisional quality and efficiency. But equally it can endanger the realisation of key procedural values of public law in the EU.

Accordingly, the CJEU also requires that ADM technology and its working in real life must be subject to regular review.¹⁰¹ This is a requirement of subsequent ongoing review. It finds that

> "…in order to ensure that, in practice, the pre-established models and criteria, the use that is made of them and the databases used are not discriminatory and are limited to that which is strictly necessary, the reliability and topicality of those pre-established models and criteria and databases used should, taking account of statistical data and results of international research, be covered by the joint review of the implementation …"¹⁰²

Regarding the specific rights involved in ADM using specific databases, one instance of anticipatory control is the requirement of conducting a Data Protection Impact Assessment (DPIA).¹⁰³ Under both Articles 35(7)a) GDPR and 39(7)a) EDPR, a

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⁹⁹ Indrė Žliobaitė and Bart Custers, Using Sensitive Personal Data May Be Necessary for Avoiding Discrimination in Data-Driven Decision Models (2016) 24 *Artificial Intelligence and Law* 183; Niklas Eder, Privacy, Non-Discrimination and Equal Treatment: Developing a Fundamental Rights Response to Behavioural Profiling, in: Martin Ebers and Marta Cantero Gamito (eds), *Algorithmic Governance and Governance of Algorithms: Legal and Ethical Challenges* (Springer International Publishing 2021).

¹⁰⁰ Judgement of the Court (Grand Chamber) of 6 October 2020: C-511-520/18 *La Quadrature du Net* ECLI:EU:C:2020:791, para 182 with reference to Opinion 1/15 (*EU-Canada PNR Agreement*) of 26 July 2017, EU:C:2017:592, paras 173, 174.

¹⁰¹ Judgement of the Court (Grand Chamber) of 6 October 2020: C-511-520/18 *La Quadrature du Net* ECLI:EU:C:2020:791, para 182 with reference to Opinion 1/15 (*EU-Canada PNR Agreement*) of 26 July 2017, EU:C:2017:592, paras 173, 174.

¹⁰² Opinion 1/15 (*EU-Canada PNR Agreement*) of 26 July 2017, EU:C:2017:592, para 174.

¹⁰³ See also Margot E Kaminski and Gianclaudio Malgieri, 'Algorithmic Impact Assessments under the GDPR: Producing Multi-Layered Explanations' [2020] International Data Privacy Law <https://doi.org/10.1093/idpl/ipaa020> accessed 13 January 2021; European Commission. Joint Research Centre., *AI Watch, Artificial Intelligence in Public Services: Overview of the Use and Impact of AI in Public*

"systematic description of the envisaged processing operations and the purposes of the processing" is necessary.[104] This will include questions of the definition of the human-machine interface in semi-automated decision making.

Such impact assessment could be necessary in the context of all ADM systems which have a potential impact on decision making. They might be seen, at least at the stage of early development of ADM technology as system relevant in the sense of the 2016 Inter-institutional agreement on better law making. According to this, impact assessments are to be conducted on all initiatives expected to have significant economic, environmental, or social impacts. The social impacts for the development of ADM technology is potentially considerable and thus merits a broad approach, anyhow necessary for the data protection aspect under the GDPR and the EDPR. Accordingly, the idea of the "Algorithmic IAs" as something different to DPIAs only, for instance including human rights assessment in general, or assessment of wider procedural issues is highly relevant.[105]

Given the many (new) challenges posed by ADM, much discussion is to also review the functioning in the context of experimental governance. Many suggestions are being discussed in the literature.[106] One approach now in EU draft legislation is to allow for solutions to be tried in such settings as 'regulatory sandboxes' - a tool to conduct regulated experiments with systems of control and accountability.[107]

Services in the EU. (Publications Office 2020) s 3.3.3. <https://data.europa.eu/doi/10.2760/039619> accessed 14 May 2021.

[104] Additionally, this is necessary for systems under Article 27 of Directive (EU) 2016/680 on the prevention, investigation, detection or prosecution of criminal offences, OJ 2016 L 119/89.

[105] See Joint Research Centre., *AI Watch, Artificial Intelligence in Public Services: Overview of the Use and Impact of AI in Public Services in the EU*. (Publications Office 2020) section 3.3.3. <https://data.europa.eu/doi/10.2760/039619> accessed 14 May 2021.

[106] Tobias D Krafft, Katharina A Zweig and Pascal D König, How to Regulate Algorithmic Decision-Making: A Framework of Regulatory Requirements for Different Applications [2020] *Regulation & Governance* 18.

[107] See e.g. Articles 53 and 54 of the European Commission, Proposal for a Regulation of the EP and the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) of 21.4.2021, COM(2021) 206 final, 2021/0106 (COD). Article 53(1) states that a "regulatory sandbox shall provide a controlled environment that facilitates the development, testing and validation of innovative AI systems for a limited time before their placement on the market or putting into service pursuant to a specific plan. This shall take place under the direct supervision and guidance by the competent authorities with a view to ensuring compliance with the requirements under this Regulation." See more generally: See e.g. Ross P Buckley and others, 'Building FinTech Ecosystems: Regulatory Sandboxes, Innovation Hubs and Beyond' [2019] SSRN Electronic Journal <https://www.ssrn.com/abstract=3455872> accessed 23 October 2020.

d) Transparency and documentation

Linked to the requirements of a reasoned decision containing a sufficient explanation of the conditions leading to a decision is the notion of transparency. Transparency has become an important *topos* in discussions of accountability of ADM systems.

Systemic transparency must cover questions such as which information will been considered as an input to decision-making, how the input will be selected and how its evaluation will lead to a decision-making proposal.[108]

One of the central challenges to this transparency of decision making is thus the recording of operations within a system. Information technology developments for securing information in the form of "tamper-evident record that provides non-repudiable evidence of all nodes' actions"[109] are becoming increasingly relevant. This would enhance traceability of data across its sources within multi-level information systems. It would also allow the review of its processing within an ADM system in a concrete process.[110] Accordingly, demands have been made that in order to "enable third parties to probe and review the behaviour of the algorithm" ADM "should be accompanied by a 'datasheet' that records the choices and manipulations of training data and the 'composition, collection process, recommended uses and so on.'"[111] Providing such data sheet to non-expert humans will however face obstacles by way of providing meaningful explanation in view of potentially formidable technical obstacles (depending on the complexity of an algorithm) as well as some questions of intellectual property rights and state and business secrets.[112]

In this respect, one of the early legislative approaches to transparency in ADM is the French code of administrative procedures, which is applicable to both individual decision-making as well as to the system-rule making level. Article L.311-3-1 of the 2016 *Code des relations entre le public et l'administration*, establishes the individual's rights of information

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[108] Ida Koivisto, *The Anatomy of Transparency: The Concept and its Multifarious Implications*, EUI MWP Working Papers 2016/09.

[109] Aziz Z.Huq, Constitutional Rights in the Machine Learning State, SSRN.Com/abstract=3613282, 49; Deven R. Desai, Joshua A. Kroll, Trust but Verify: A Guide to Algorithms and the Law, 31 *Harvard Journal of Law and Technology* (2017), 1, 10-11. One currently increasingly wide-spread approach is based on distributed ledger technology often known as 'blockchain'.

[110] Herwig C.H. Hofmann, Morgane Tidghi, Rights and Remedies in Implementation of EU Policies by Multi-Jurisdictional Networks (2014) *European Public Law* 147-164, discussing notions of tagging of information.

[111] Aziz Z.Huq, Constitutional Rights in the Machine Learning State, SSRN.Com/abstract=3613282, 48.

[112] Maja Brkan, Do Algorithms Rule the World? Algorithmic Decision-Making and Data Protection in the Framework of the GDPR and Beyond, 27 *International Journal of Law and Information Technology* (2019) 91, 120.

regarding the extent of algorithm-based rules used to make administrative decisions, together with the criteria used and the weighting thereof by the computer programme. It equally provides that the person or persons concerned must be informed whenever a relevant administrative decision has been made on the basis of algorithmic processing and they have the option of requesting information about certain elements in the relevant procedure.[113]

The Commission's draft AI Act is much less demanding concerning transparency requirements.[114] Article 11(1) of the Commission's draft AI Act foresees for high-risk AI systems the obligation to maintain technical documentation "in such a way to demonstrate that the high-risk AI system complies with the requirements of the law and to allow supervisory authorities to verify such compliance.[115]

A demand of traceability of data movements and data processing by ADM, which had been made in legal literature,[116] has found its way into Article 12 of the Commission's draft AI Act albeit only for high-risk AI systems. The latter requires AI systems to contain record-keeping facilities to log and tracking operations conducted by AI systems. Such record keeping facilities, according to Article 12 of the Commission's draft AI Act, would need to "ensure a level of traceability of the AI system's functioning throughout its lifecycle" (Article 12(2)), and the logging capabilities must provide at least "recording of the period of each use of the system … the reference database against which input data has been checked by the system; the input data for which the search has led to a match" as well as "the identification of the natural persons involved in the verification of the results." This formulation is technology-neutral but some work is being undertaken to

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[113] See: French Décret No 2017-330 du 14 mars 2017 relatif aux droits des personnes faisant l'objet de décisions individuelles prises sur le fondement d'un traitement algorithmique, JORF n°0064 du 16 mars 2017.

[114] Article 52 of the European Commission, Proposal for a Regulation of the EP and the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) of 21.4.2021, COM(2021) 206 final, 2021/0106 (COD) requires no specific type of transparency for AI systems that are not deemed to be high risk other than notifications to natural persons that they are interacting with an AI system, unless such is obvious (Article 52(1)), and that they might be exposed to their data "being processed by an emotion recognition system" (Article 52(2)) or that their images have been artificially recreated or manipulated (Article 52(3)) unless this is done for public security or other prevailing public interests.

[115] European Commission, Proposal for a Regulation of the EP and the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) of 21.4.2021, COM(2021) 206 final, 2021/0106 (COD).

[116] See e.g. Herwig C.H. Hofmann, Morgane Tidghi, Rights and Remedies in Implementation of EU Policies by Multi-Jurisdictional Networks (2014) *European Public Law* 147-164, discussing notions of tagging of information.

harness distributed ledger technology such as blockchain approaches to maintain such tagging and tracking.

The Commission's draft AI Act also foresees that 'high-risk' AI systems must provide for appropriate "human-machine interface tools" so they can be subject to human oversight.[117] Such oversight by natural persons must be ensured through appropriate technical installations.[118] The individuals to whom human oversight is assigned must be enabled to "fully understand the capacities and limitations of the high-risk AI system and be able to duly monitor its operation so that signs of anomalies, dysfunctions and unexpected performance can be detected as soon as possible"[119] and must be trained to resist potential "automation bias".[120] The case law of the CJEU and the legislation on data protection have developed more far reaching human oversight requirements as discussed above. The reason for a relatively limited regulatory content on this in the Commission's draft AI Act may be that such act is addressed at private and public uses of AI at the same time. This is a problematic notion since the use of AI in public decision-making should better be integrated into a general EU administrative procedures act and address specific effects of ADM on decision-making and rule-making procedures.

Legal requirements on ADM system programming have also led to calls for formulating law, especially administrative rule making, in certain regulatory matters as 'machine readable law'.[121] Whether such steps would be necessary in order to achieve more transparency in law is debatable. Natural language processing is a fast-developing field of computer sciences, increasingly allowing to convert text, which from a computer science

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[117] Article 14(1) of the European Commission's Proposal for a Regulation of the EP and the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) of 21.4.2021, COM(2021) 206 final, 2021/0106 (COD).

[118] Article 14(1) of the European Commission's Proposal for a Regulation of the EP and the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) of 21.4.2021, COM(2021) 206 final, 2021/0106 (COD).

[119] Article 14(4)(a) of the European Commission's Proposal for a Regulation of the EP and the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) of 21.4.2021, COM(2021) 206 final, 2021/0106 (COD).

[120] Article 14(4)(b) of the European Commission's Proposal for a Regulation of the EP and the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) of 21.4.2021, COM(2021) 206 final, 2021/0106 (COD).

[121] This would require the formulation of legal texts in a form that would be readable by a computer programme, i.e. follow a more algorithm-oriented logic and therefore structured in a certain way. It would, with other words, introduce an obligation to observe a more mathematical logic into legal norms. See with further discussion and references e.g. John Nay, Natural Language Processing and Machine Learning for Law and Policy Texts, https://ssrn.com/abstract=3438276 or http://dx.doi.org/10.2139/ssrn.3438276

point of view remains relatively unstructured, into a more formalized representation that computer programmes are capable of analyzing.[122]

2.   Accountability of individual ADM

Several principles add to accountability mechanisms in the context of individual decision making. These arise from general administrative law requirements as well as more data specific ones.

a) Right to oppose ADM and human oversight

One of the central questions regarding accountability of ADM is the right to oppose it where the use of personal data is involved. The right to oppose ADM is an additional feature of the EU's regulatory framework design of human-technology interfaces.

The GDPR and the EDPR[123] proclaim the right to oppose to be made subject to a decision based solely on automated processing when such decision produces legal effects. Under Articles 22 GDPR and 24 EDPR, data subjects have the right to oppose automated individual decision-making concerning them unless such form of decision-making is explicitly authorized by EU or Member State legislation and the possibility of human intervention is ensured.[124] The right to oppose full ADM is explicitly stated under Articles 22(1) GDPR and 24(1) EDPR.[125] which are identical and read:

> "The data subject shall have the right not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning him or her or similarly significantly affects him or her."

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[122] John Nay, Natural Language Processing and Machine Learning for Law and Policy Texts, https://ssrn.com/abstract=3438276 or http://dx.doi.org/10.2139/ssrn.3438276

[123] Regulation 2018/1725 of the European Parliament and the Council of 23 October 2018on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC, OJ 2018 L 295/39.

[124] A similar provision is contained in Article 11 of the Directive on Data Protection in Criminal Matters Directive (EU) 2016/680 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 by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data, and repealing Council Framework Decision 2008/977/JHA, OJ 2016 L 119/1.

[125] Maja Brkan, Do algorithms rule the world? Algorithmic decision-making and data Protection in the framework of the GDPR and beyond, 27 *International Journal of Law and Information Technology* (2019) 91-121, 102.

The prohibition enshrined in Articles 22 GDPR and Article 24 EDPR is, however, applicable in narrowly defined circumstances only. First, the right to oppose ADM concerning personal data only concerns automation, "which produces legal effects" or "significantly affects" the data subject. The EU's data protection authorities argued,[126] that a decision under Article 22(1) GDRP producing legal effects shall be only those, which

> "significantly affect the circumstances, behaviour or choices of the individuals concerned; have a prolonged or permanent impact on the data-subject; or at its most extreme, lead to the exclusion or discrimination of individuals."[127]

Second, the right to oppose decisions based on automated processing of personal data may have only a limited reach in cases of semi-automatic or augmented decision making, especially where the automated processing takes place in a phase prior to the final decision making by a human. Accordingly, the WP 29 guidelines on automated decision-making find[128] that Articles 22(1) GDPR and 24(1) EDPR[129] are applicable only in the absence of any meaningful human input into decision-making which is not the case where the automated component to decision making is merely auxiliary to the human decision.[130] The data protection authorities (in the Article 29 WP's guidelines) state that

> "[t]o qualify as human involvement the controller must ensure that any oversight of the decision is meaningful, rather than a token gesture. It should be carried out

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[126] Article 29 Data Protection Working Party, 'Guidelines on Automated individual decision-making and Profiling for the purposes of Regulation 2016/679,' 17/EN WP251rev.01, adopted on 3 October 2017, as last revised and adopted on 6 February 2018, 20–21.56.

[127] Article 29 Data Protection Working Party, 'Guidelines on Automated individual decision-making and Profiling for the purposes of Regulation 2016/679,' 17/EN WP251rev.01, adopted on 3 October 2017, as last revised and adopted on 6 February 2018.

[128] Article 29 Data Protection Working Party, 'Guidelines on Automated individual decision-making and Profiling for the purposes of Regulation 2016/679,' 17/EN WP251rev.01, adopted on 3 October 2017, as last revised and adopted on 6 February 2018, 20–21.56.

[129] The Article 29 Data Protection Working Party, Guidelines on Automated individual decision-making and Profiling for the purposes of Regulation 2016/679, 17/EN WP251rev.01, adopted on 3 October 2017, as last revised and adopted on 6 February 2018 had stated on the basis of the pre-decessors of Article 22 GDPR (ex-Article 15 Regulation 95/46) and the equivalent Article 24 Regulation 2018/1725 (ex-Article 19 Regulation (EC) 45/2001) applying to EU institutions and bodies, and Article 11 Directive (EU) 2016/680 (the 'Law Enforcement Directive').

[130] See also Maja Brkan, Do algorithms rule the world? Algorithmic decision-making and data Protection in the framework of the GDPR and beyond, 27 *International Journal of Law and Information Technology* (2019) 91-121, 101, 102; Tal Zarsky, Incompatible: The GDPR in the Age of Big Data (August 8, 2017), 47 *Seton Hall Law Review*, (2017) at SSRN: https://ssrn.com/abstract=3022646, 1016.

by someone who has the authority and the competence to change the decision. As part of the analysis, they should consider all the relevant data"[131]

Therefore, the WP 29's guidelines make an implicit link between the right to human oversight to the duty of care in that a human should be capable of assessing 'all relevant' data. This makes for an important clarification and, arguably, a high hurdle for ADM systems to comply to. The 'human in the loop' should thus have the capability of extracting the data from the ADM system and considering it independently. For example, informational cooperation under the AFSJ is mostly based on humanly pre-programmed algorithms translating data input into specifically pre-defined outputs, not thus far using machine learning systems.[132] Although there are some conceptual considerations of developing self-learning capabilities, these are yet to be rolled out. Hence, a human agent remains finally responsible for acts adopted, irrespective of whether such agent has full understanding of the processing applications generating the suggestions. However, to fulfill the requirements, in view of the Article 29 WP, the human will have to be able to obtain full knowledge of all relevant decision-making factors and review them 'by hand'.

It also appears safe to state that human involvement merely in the form of implementing a decision taken by a full ADM will not be sufficient to qualify as human involvement. On the other hand, some form of real and informed decisional input will ensure that Article 22 GDPR and Article 24 EDPR do not lead to the illegality of decision-making procedures. The right to object ADM is thus a right most relevant with respect to cyber-delegation in the form of full delegation of powers to ADM. In those circumstances, however, the right to an effective judicial review in general, as well as the right to compliance with the duty of care and of reasoning obligations will also have the effect that an ADM system will need to give detailed explanations as to the input taken into account and the decision-making process and outcome resulting therefrom.

A third factor limiting the reach of the right to oppose ADM is provided for in by the GDPR and the EDPR, which allow for explicit authorisation of ADM by EU or national law (e.g. Article 23 GDPR) in cases where ADM is required for matters of national security and other legitimate public interests.

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[131] Article 29 Working Party 'Guidelines on Automated individual decision making and Profiling for the purposes of Regulation 2016/679 17/EN WP251 rev.01, 21.

[132] European Union Agency for Fundamental Rights, *Data Quality and Artificial Intelligence – Mitigating Bias and Error to Protect Fundamental Rights*, Report of 7 June 2019 (https://fra.europa.eu/en/publication/2019/data-quality-and-artificial-intelligence-mitigating-bias-and-error-protect), 2.

Following this, the question is what the data subject's "right not to be subject to a decision based solely on automated processing" under Articles 22 GDPR and 24 EDPR contains. How should human review of a decision based on automated processing look like? Should it be understood in the sense that the initial decision-making procedure itself need to be conducted with human input. Arguably, the wording also allows to understand that right as a right to a complaint and subsequent handling of the decision in the context of a human form of oversight which could be granted, for example, in the context of the exercise of administrative oversight such as in the form of complaint boards of EU agencies or other administrative review procedures.

Next to the right to oppose ADM in matters concerning the processing of personal data, there is also a more general discussion about a right to human review. Nonetheless, cases for this arise from the field of the transfer of personal data to third countries and the possibility of human review in ADM in that context. Given that the analysis of complex data collections by computer systems necessarily involves "some margin of error", [133] any positive result obtained following automated processing of information must be subject to the possibility of an individual re-examination by non-automated means "before an individual measure adversely affecting the persons concerned" may be adopted.[134]

This requirement raises several points. First, human review must cover the informational input into the decision making in order to review such 'margin of error'. The human reviewer must therefore either have some form of profound conceptual understanding of the ADM system or must be able take a decision in knowledge of the concrete circumstances of a specific factual situation to independently of the ADM system. Such knowledge can be brought to the human reviewer through independent expertise.[135] It however remains to be seen whether the case law or future legislation will require the latter review mechanisms to have the power of a full *de novo* investigation, in which a human administrator begins with a 'manual' collection of relevant information and derives a decision thereof, or, whether, seemingly in opposition to the Working Group 29 WP, a more summary review would be accepted by courts. For high-risk AI systems this is also

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[133] Judgement of the Court (Grand Chamber) of 6 October 2020: C-511-520/18 *La Quadrature du Net* ECLI:EU:C:2020:791, para 182 referring specifically to the analysis of traffic and location data.

[134] Judgement of the Court (Grand Chamber) of 6 October 2020: C-511-520/18 *La Quadrature du Net* ECLI:EU:C:2020:791, para 182 referring specifically to the analysis of traffic and location data.

[135] For example, Article 41 of Regulation (EU) 2018/1862 on the establishment, operation and use of the Schengen Information System (SIS) in the field of police cooperation and judicial cooperation in criminal matters, OJ 2018 L 312/56, states that "[i]n the event of a hit with the data entered pursuant to Article 40, the identity of the person shall be established in accordance with national law, together with expert verification that the dactyloscopic data in SIS belong to the person."

subject to draft codification in the AI Act. The Commission's proposal puts far reaching demands on the programming by foreseeing that an AI system capable of ADM must allow a person conducting human oversight to "intervene in an operation or to disregard, override or reverse the output of a high risk AI system."[136] Where AI systems are employed in less sensitive matters or with less sensitive technology, such standards may still be used as benchmarks for assessing compliance of ADM systems with general principles of EU law.

b) Care, reasoning, explanations, and information

Not ADM-specific but nonetheless directly relevant for ADM design are requirements under the CJEU's general principle of a right to a reasoned decision. A decision must demonstrate compliance with essential procedural requirements. Obligations are frequently restated by the CJEU's requiring that a decision's reasoning must enable a concerned person:

> "to ascertain the reasons upon which the decision taken in relation to him or her is based, either by reading the decision itself or by requesting and obtaining notification of those reasons, without prejudice to the power of the court with jurisdiction to require the authority concerned to provide that information, so as to make it possible for him or her to defend his or her rights in the best possible conditions and to decide, with full knowledge of the relevant facts, whether there is any point in applying to the court with jurisdiction, and in order to put the latter fully in a position in which it may carry out the review of the lawfulness of the national decision in question."[137]

This passage evokes a set of essential procedural requirements[138] - including compliance with the duty of care and the obligation to give adequate reasons for the adopted

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[136] Article 14(1) of the European Commission's Proposal for a Regulation of the EP and the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) of 21.4.2021, COM(2021) 206 final, 2021/0106 (COD).

[137] Judgment of the Court (Grand Chamber) of 24 November 2020, Joined Cases C-225/19 and C-226/19 *R.N.N.S., K.A. v Minister van Buitenlandse Zaken* ECLI:EU:C:2020:951, para 43.

[138] See e.g. judgments of 6 September 2013, Case T-483/11 *Sepro Europe Ltd v Commission*, ECLI:EU:T:2013:407, para 162; of 22 April 2015, Case T-554/10 *Evropaïki Dynamiki v Frontex* ECLI:EU:T:2015:224, paras 79-81; of 13 July 2018, Case T-786/14 *Bourdouvali a.o. v Council a.o.* ECLI:EU:T:2018:487, para 389, of 13 December 2018, Case T-591/16 *Wahlström v Frontex*

measure.[139] These requirements are to be complied with also where they are not explicitly or implicitly required under the specific EU legislation.[140] An inadequately reasoned decision will be understood also as a breach of the 'duty of care', and can thus justify annulment of the contested measure. Reasons must demonstrate that the decision was taken on the basis of "the most complete 'factually accurate, reliable and consistent' information possible."[141] Generally speaking, reasoning is a concept requiring the administration to document having reflected on all matters which may be subject to later judicial review.[142] For example, the important proportionality considerations are to a specific decision, the more indications of the taking into account of these matters must be documented in decision-making. This obligation relates also to the duty of care in EU public law.

With respect to ADM, much of the discussion so far has been on explanation of decision making and the 'explainability' of decision making with the help of complex computer systems. Specifically, advanced AI systems using machine learning can be problematic if these systems do not explicitly record and report the data used, the weighing of information and the reasons for the choice between different decision-making approaches.

ECLI:EU:T:2018:938, para 88; and of 22 September 2016, Case C-442/15 P *Pensa Phrama SA v EUIPO* ECLI:EU:C:2016:720, para 35.

[139] See e.g., judgment of 5 November 2014, Case C-166/13 *Mukarubega v Seine-Saint-Denis* ECLI:EU:C:2014:2336 paras 43–49; of 8 May 2014 Case C-604/12 *H. N.* ECLI:EU:C:2014:302, para 49; and of 20 December 2017, Case C-521/15 *Spain v Council* ECLI:EU:C:2017:982, para 89.

[140] Joined Cases C-225/19 and C-226/19 *R.N.N.S., K.A. v Minister van Buitenlandse Zaken*, paras 33-34, where the Grand Chamber reiterates that "Article 41 of the Charter reflects a general principle of EU law, which is applicable to Member States when they are implementing that law, to the effect that the right to good administration encompasses the obligation of the administration to give reasons for its decisions." With further reference to judgment of 8 May 2019, Case C-230/18 *PI* ECLI:EU:C:2019:383, para 57.

[141] Herwig CH Hofmann, 'The Duty of Care in EU Public Law - A Principle Between Discretion and Proportionality' (2020) 13 Review of European Administrative Law 87, 100. Citing the judgment of 22 November 2007, Case C-525/04 P *Spain v Lenzing* ECLI:EU:C:2007:698, para 57. In this judgment the Court reiterated that 'not only must the Community judicature establish whether the evidence relied on is factually accurate, reliable and consistent but also whether that evidence contains all the information which must be taken into account in order to assess a complex situation and whether it is capable of substantiating the conclusions drawn from it.' With further references to the relevant case-law. See section 4.1. below for the conceptualization of the reasoning requirements arising from the principle of duty of care.

[142] The right to a reasoned decision is a right guaranteed under the right to good administration, there also explicitly recognised in Article 41(1)b CFR, as well as under the right to an effective judicial remedy, as also recognised in Article 47(1) CFR.

The 'right to an explanation' with respect to single case ADM[143] is thus linked to the right to a reasoned decision and the degree of reasoning necessarily required by the case law of the CJEU under principles of good administration and the right to an effective judicial protection. That may require documentation and reporting of all processing activities.[144] As much has now been proposed in the Commission's draft AI Act after several years of discussion in the literature. Additionally, reason-giving in individual cases might also require explanations concerning the system-level functioning and logic of programmes used in ADM.[145]

ADM and Cyber-Delegation in EU public law?

ADM systems are increasingly transforming decision-making procedures under EU public law. This requires consideration of criteria for accountability from a legal point of view.

The first observation is that it is necessary to distinguish between conditions governing, on the one hand, the quasi rule-making character of ADM *systems* from, on the other hand, *individual decisions* made with the help of ADM technology. The systemic element requires considerations akin to those applied to administrative rulemaking, whereas the application of ADM technology in individual procedures requires analysis from the consideration of legality of individual acts.

Today, ADM is mainly used to support certain phases of a decision-making procedure, such as the initiation or the investigation phases. Each has specific requirements to ensure accountability of public action and the protection of individual substantive and procedural rights. Legal principles applicable to review accountability may differ according to the phase, the ADM system is used in.

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[143] Lilian Edwards and Michael Veale, 'Slave to the Algorithm? Why a "right to an Explanation" Is Probably Not the Remedy You Are Looking For' (2017) 16 Duke Law & Technology Review 18; Bryan Casey, Ashkon Farhangi and Roland Vogl, 'Rethinking Explainable Machines: The GDPR's "Right to Explanation" Debate and the Rise of Algorithmic Audits in Enterprise' (2019) 34 *Berkeley Technology Law Journal* 143.

[144] European Union Agency for Fundamental Rights and Council of Europe, *Handbook on European Data Protection Law* (Publications Office of the European Union 2018) <http://fra.europa.eu/en/publication/2016/handbook-european-law-relating-access-justice> accessed 29 March 2017.

[145] Garry Coglianese, David Lehr, Regulating by Robot: Administrative Decision Making in the Machine-Learning Era, 105 *The Georgetown Law Journal* (2017) 1147-1223, 1207, state that reason giving will require to also "disclose algorithmic specifications, including the objective function being optimised, the method used for that optimisation and the algorithm's input variables."

Several ADM systems can be combined in one decision-making procedure. However, the more policy phases of a decision-making procedure are subject to ADM, the stronger the move towards forms of 'cyber-delegation', i.e. forms of delegation of decision-making powers to an automated system.[146] Criteria of legality of delegation of powers would be applicable in that context. These can however also be helpful for assessing more limited deployment of ADM technology.

This arises from linking different decision-making logics, akin to integrating expert knowledge into legally structured decision-making procedures. ADM systems are based on computer science logic and need to comply with requirements developed in law, especially EU public law. The use of ADM systems, often impenetrable to human review, accentuates problems arising from information asymmetries. The accountability of ADM systems is then also highly influenced by the design of human-machine interfaces allowing general review of an ADM system as well as the review of a specific decision made with the help of ADM technology.

ADM systems are also generally programmed with access to specific data basis or data sources in mind. Conditions of accountability of ADM is thus linked to the nature of the data supplied for decision-making. ADM cannot be dissociated from the databases it uses and legal and practical problems of data collections, data protection, data-interoperability, and data quality. In this context, factors of accountability will also differ whether the ADM technology is applied to data stemming from private or from public data bases. They will also be linked to the nature of data basis in the EU arising from multi-jurisdictional cooperation. Decision making based on these data basis is composite since a single administrative procedure will then have received input from actors applying rules from various jurisdictional levels. The use of databases in which data is supplied might thus lead to the inclusion of ADM into composite decision-making procedures governed by a mix of national and EU law.

Overall, the inclusion of decision making with the help of ADM technology raises the level of complexities to be addressed in administrative law: The features of human-machine interfaces, access and processing of data from multi-level data bases, integration of ADM into composite procedures and the underlying complexities of AI programming

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[146] Although public administration in the EU lags the level of adoption of ADM systems known in some private sectors, there is an increasing level of use in diverse EU policy areas such as e.g. border control and immigration, financial market regulation and reporting as well as transport regulation.

undertaking this level of digitalisation of decision making all contribute to growing complexity. Design choices in law and technology need to be made to ensure that there is no disconnect between, on one hand, legal principles designed to ensure accountability, and, on the other hand, the possibilities and restrictions of ADM technology and the *real-life design* of the procedures employed in the digitalisation of government functions in the EU. Normative steering must be possible and as such is a requirement of the principles of democratic steering in a system under the rule of law. If this is the case, the use of ADM can make use of the increase in the decision-making speed and quality of data analysis made possible by technological advances. But technical approaches must be designed in a way to ensure that accountability is ensured whilst the promises of using automation in decision making can be enjoyed in the public sphere. Normative steering is a necessity to ensure accountability of ADM used in public policies.