

ALGORITHMIC STATE AS A NEW PARADIGM IN CONTEMPORARY CONSTITUTIONAL AND EUROPEAN LAW

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Abstract:

*This chapter is devoted to the status of the Algorithmic State in the context of modern European and Constitutional law. The research provides a potential definition of the algorithmic state and to what extent its scope will be entangled in the framework of the contemporary entity and personality of state. Nowadays, the legal framework of the Algorithmic State is neither regulated as a complete concept in Constitutional nor in European law (TEU and the TFEU). Only certain areas consist algorithmic approach are legally regulated, while others are in the process of their initial regulation. It is in fact a legal phenomenon which presents a necessity of new paradigm concerning legal status of state in digital environment. The Algorithmic State is a complex concept that manifests its primary legal dimensions. Practically, the study gives a reasoned explanation that the Algorithmic State has a new type of functional characteristics that ensure its application. It builds the modern statehood by combining technological and legal components with established traditional political forms. The article also traces the discussions on amendments of the constitutions on national level and the readiness to develop a common legal framework regulating the legal aspects of the Algorithmic State. Legislators will be faced with a *fait accompli*. The Algorithmic State ideological status quo is facing a challenge. The author expresses a position that the Algorithmic State is in its early stage and shows flexibility and adaptability to be integrated as an element of modern state.*

Keywords: *algorithmic state, digitalisations of law and society, personal data, artificial intelligence, new paradigm of law, algorithm, algorithmic modelling, human rights.*

1.1. Introduction

Algorithmic State (AS)¹ is a new concept of essential importance for the development of society and the information technology environment, which needs legal regulation. At the current stage AS doesn't exist as a clear notion with an independent legal framework, despite the researchers' attempts

¹ The beginning of AS discussion is set by European universities, in particular the University of Tilburg and the University of Utrecht, Netherlands.

to define it in the recent years, including through the creation of special research groups such as “Algorithmic State, Society and Market - Constitutional Dimensions”². There is also a lack of a legal regime for AS even in countries with an avant-garde attitude and with strategic approaches to the development of the digital paradigm in the socio-legal environment. Among these countries are the member states of the European Union, the United States of America, United Kingdom, Israel, China, South Korea, India, and Japan. However, AS is formed as an independent legal and technical concept with content and element composition. The definition of AS is a matter of debate ³, related to the distinct features of the digital environment. The previous outlines new forms in the structure of society influenced by information and communication technologies (ICT). Algorithms and Algorithmic Decision Making (ADM)⁴ are the basis of AS understanding. They are involved in the modern functioning of several social processes and relations in the fields of education, justice, e-government, healthcare, and security. The emergence of the triad of algorithms, artificial intelligence, and smart robots⁵ changes the development of social processes and raises the question of the state functioning in the digital space. Digital technologies are outpacing legal regulation in several spheres and sectors of public life. This fact raises the question of whether the EU⁶ and the individual member states, provide adequate legal protection of fundamental human rights. Technological challenges have found expression in the EU Law through the adoption of legislative acts, perceived as different manifestations of the algorithmic

² ‘Algorithmic State, Market & Society – International Association of Constitutional Law (IACL) Research Group’ <<http://www.algorithmicstate.eu/>> accessed 5 August 2022.

³ Marta Cantero Gamito and Martin Ebers, ‘Algorithmic Governance and Governance of Algorithms: An Introduction’ 1. These authors explain the AS through the lens of algorithmic governance and the governance of algorithms.

⁴ 3 p. 3

⁵ 3 p.11

⁶ E Aarts, ‘Artificial Intelligence: Up to Here ... and on Again — Tilburg University Research Portal’ (*Tilburg University*, 2022) 18

<<https://research.tilburguniversity.edu/en/publications/artificial-intelligence-up-to-here-and-on-again>> accessed 21 November 2022.

environment – artificial intelligence (AI)⁷, personal data⁸, electronic messages⁹, digital services¹⁰.

AS develops as a phenomenon with a presence in the current and future form of statehood. Its unconventional formulation requires the realization that the algorithmic method is a practical and very effective way to solve social problems with digital means. AS is a new form combining algorithms through their existing systematization problems¹¹ of the social environment which find their solution in the digital space. This is a serious challenge, reconsidering the modern understanding of constitutionalism. The characteristics of the algorithmic legal regime have the potential to become a new element of statehood and a new branch of legal sciences – algorithmic law. The definition of AS concept is considered in the context of Constitutional law and European Union Law, involving a consistent study of a few notions – “algorithm”¹²,

⁷ Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (artificial intelligence act) and amending certain union legislative acts 21/04/2021.

⁸ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), ELI: <http://data.europa.eu/eli/reg/2016/679/oj>, 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, ELI: <http://data.europa.eu/eli/dir/2016/680/oj>.

⁹ Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector, Directive on privacy and electronic communication, ELI: <http://data.europa.eu/eli/dir/2002/58/oj>

¹⁰ Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market for Digital Services and amending Directive 2000/31/EC (Digital Services Act), ELI: <http://data.europa.eu/eli/reg/2022/2065/oj>.

¹¹ Joan Lopez Solano and others, ‘DIGITAL DISRUPTION OR CRISIS CAPITALISM?’ p. 11-12.

¹² Algorithm is a sequence of instructions telling a computer what to do. In the broadest sense, algorithms “are encoded procedures for transforming input data into a desired output, based on specified calculations.” Tarleton Gillespie, ‘The Relevance of Algorithms’, *Media Technologies* (The MIT Press 2014). Céline Castets-Renard, ‘Accountability of Algorithms in the GDPR and Beyond: A European Legal Framework on Automated Decision-Making’ (2019) 30 *Fordham Intellectual Property, Media and Entertainment Law Journal* <<https://ir.lawnet.fordham.edu/iplj/vol130/iss1/3>> accessed 29 November 2022. In view of the trends in the application of algorithms in the legal environment, the article perceives its broader meaning in the context of the new relations, in which an increased algorithmic presence is observed, because the digital environment functions on the basis of algorithms.

„algorithmic modelling“¹³, „algorithmic power“¹⁴, „algorithmic society“¹⁵ and „algorithmic governance“¹⁶, as well as their application at the state level in the conditions of constantly developing ICT. Obviously these notions must be synchronized with the principle of state sovereignty as a supreme power. It can be reasonably argued that the emergence of the AS leads to the emergence of a new type – technological sovereignty¹⁷, although sovereignty is characterized by relative conservatism and resilience.

This chapter traces the theoretical fundamentals of the AS concept, compares the established understanding of the state with AS, introduces the understanding of its five-level correlation with the protection of human rights, information society, digital economy, e-governance and of personal data protection.

The main conclusions are based on the comparative and systemic research approach. The first serves the author to explore the concept of AS and to what extent it is subject to legal regulation. The second expresses the role of digitization and its influence on the atypical formulation of algorithmic powers in terms of the source from which algorithmic legitimacy is depicted.

The present chapter is with the following sequence:

Stage 1. Clarification of the conceptual apparatus used and examination of the existing concepts of AS.

Stage 2. The formulation of the author' own definition of the AS concept.

¹³ ‘Algorithmic Model | Definition of Algorithmic Model by Webster’s Online Dictionary’ <[https://www.webster-dictionary.org/definition/Algorithmic Model](https://www.webster-dictionary.org/definition/Algorithmic%20Model)> accessed 21 November 2022. The same concept is conveyed in Patrick Courtney, Neil Thacker and Adrian F Clark, ‘Algorithmic Modelling for Performance Evaluation’ (1997) 9 Machine Vision and Applications 219.

¹⁴ Fabian Ferrari and Mark Graham, ‘Fissures in Algorithmic Power: Platforms, Code, and Contestation’ (2021) 35 <https://doi.org/10.1080/09502386.2021.1895250> 814 <<https://www.tandfonline.com/doi/abs/10.1080/09502386.2021.1895250>> accessed 5 August 2022.

¹⁵ Rik Peeters and Marc Schuilenburg, ‘The Algorithmic Society : An Introduction’ [2020] The Algorithmic Society 1 <<https://www.taylorfrancis.com/chapters/edit/10.4324/9780429261404-1/algorithmic-society-rik-peeters-marc-schuilenburg>> accessed 25 November 2022.1-15

¹⁶ Paul Henman, ‘Governing by Algorithms and Algorithmic Governmentality : Towards Machinic Judgement’ [2020] The Algorithmic Society 19 <<https://www.taylorfrancis.com/chapters/edit/10.4324/9780429261404-3/governing-algorithms-algorithmic-governmentality-paul-henman>> accessed 25 November 2022.

¹⁷ Aaron Martin and others, ‘Digitisation and Sovereignty in Humanitarian Space: Technologies, Territories and Tensions’ [2022] <https://doi.org/10.1080/14650045.2022.2047468>

<<https://doi.org/10.1080/14650045.2022.2047468>> accessed 21 November 2022.

Stage 3. Justification of the necessity for an AS legal regulation in the context of Constitutional law and EU Law.

Stage 4. Proposal for standards for potential legal regulation of ADM in the context of AS.

Stage 5. Final conclusions on the *status quo* of the AS concept.

1.2. Clarifying the content of algorithmic state and author' position of it

Innovative technologies including the rise of "Big Data"¹⁸, universal computing and cloud storage systems are creating a new social order known as algorithmic regulation¹⁹. Now AS is associated with the distinct features of the digital environment. It outlines the new forms in the structure of society, influenced by ICT. The algorithm is a building block of the AS. Following its transformations through algorithmic modelling, algorithmic powers, algorithmic society and algorithmic governance, an explanation for the AS subsequently arrives. In connection with the newly created order of algorithmic regulation, the algorithmic legal relationship also arises. It must be allowed based on certain conditions. This means that it is a regime that, to develop, its purpose and the compliance of the algorithm with the basic principles of law, the expected results, and the reason why the replacement is necessary, must be specified in advance, instead of the traditional legal relationship.

1.2.1. Algorithm²⁰

To explain the algorithms, emphasis is placed on the commonly accepted definitions used such as e.g.: „An algorithm is a procedure for solving a mathematical problem in a finite number of steps, often involving repetition of an operation; in general: a step-by-step procedure for solving a problem or achieving some goal, especially by computer”²¹. Other authors

¹⁸ Buyya Rajkumar Rodrigo N Calheiros and Amir Vahid Dastjerdi, *Big Data : Principles and Paradigms* (17th edn, Cambridge MA: Elsevier/Morgan Kaufmann 2016).

¹⁹ Karen Yeung, ‘Algorithmic Regulation: A Critical Interrogation’ (2018) 12 *Regulation & Governance* 505 <<https://onlinelibrary.wiley.com/doi/full/10.1111/rego.12158>> accessed 19 November 2022.

²⁰ Lisa Herzog and others, ‘Old Facts, New Beginnings: Thinking with Arendt about Algorithmic Decision-Making’ (2021) 83 *Review of Politics* 555 <<https://research.rug.nl/en/publications/old-facts-new-beginnings-thinking-with-arendt-about-algorithmic-d>> accessed 5 August 2022.

²¹ ‘Algorithm Definition & Meaning - Merriam-Webster’ <<https://www.merriam-webster.com/dictionary/algorithm>> accessed 29 November 2022. Algorithm is a sequence of

explore the theoretical foundations of the algorithm²² to arrive at its modern manifestations in various algorithmic decision-making systems²³. In turn, the basis of the algorithm is the information²⁴ that the algorithm processes to achieve a certain goal. Evidence of this is decision-making because of human activity, but implemented in a non-physical, technology-based environment²⁵.

The development of the digital environment attracts the attention of legal doctrine and practice, emphasizing the adaptation of algorithms and their manifestations in the traditional state. A leading circumstance in the algorithms is the corresponding mathematical matrix in which there is input and output information. When determining its purpose, mathematical tasks are formulated, with which they are transferred to means containing certain components of socially significant questions and problems. The intersection between the formulated task and the objectively existing problem in society is exactly the solution of the algorithm. The result of the algorithm's output information is particularly important from its application point of view. One or more social problems can be dressed in an algorithmic form²⁶ which find an option for dealing with them through the solution of the preliminary modelled task.

Therefore, AS cannot be considered in isolation from algorithms since they are one of the elements in its content. They are manifested in modern systems that support the decision-making process in various areas of public life.

instructions telling a computer what to do. In the broadest sense, algorithms “are encoded procedures for transforming input data into a desired output, based on specified calculations.”
²² John H Maindonald, ‘Algorithm - Some Theory’ [2014] Wiley StatsRef: Statistics Reference Online
<<https://onlinelibrary.wiley.com/doi/full/10.1002/9781118445112.stat05005>> accessed 19 November 2022.

²³ ‘Understanding Algorithmic Decision-Making: Opportunities and Challenges’
<<http://www.europarl.europa.eu/thinktank>> accessed 19 November 2022.

²⁴ J Michael Dunn, ‘INFORMATION IN COMPUTER SCIENCE’ [2008] Philosophy of Information 581.

²⁵ Oreste Pollicino and others, ‘Constitutional Challenges in the Algorithmic Society’ [2021] Constitutional Challenges in the Algorithmic Society.

²⁶ Ico Maly, ‘Algorithms, Interaction and Power: A Research Agenda for Digital Discourse Analysis’ (2022) 7 King’s College 343
<<https://research.tilburguniversity.edu/en/publications/algorithms-interaction-and-power-a-research-agenda-for-digital-di>> accessed 21 November 2022. Robert Gorwa, Reuben Binns and Christian Katzenbach, ‘Algorithmic Content Moderation: Technical and Political Challenges in the Automation of Platform Governance’: (2020) 7
<https://doi.org/10.1177/2053951719897945>
<<https://journals.sagepub.com/doi/full/10.1177/2053951719897945>> accessed 5 August 2022.

1.2.2. Algorithmic modelling

The systemic explanation of AS begins with algorithmic modeling. Apart from the purposes of computer programming, algorithmic modeling²⁷ is a term that is seen in the context of AS as a process that influences politics and law. It represents the core and scope of AS. Algorithmic modeling is a substantial and conscious activity that is performed by a person or group of experts who clearly understand what is intended by developing a particular algorithm and what consequences will occur for individuals from applying the algorithm's data. The strategic resource of the algorithm is the data that motivates one or another decision making. This process can be done automatically or through a decision that requires subsequent approval by the person who is involved in public relations in order to protect human rights²⁸ in the public relations intervention process.

Due to its technological advantage, the initiative for the preparation of the algorithms is seized by private legal entities. High-tech companies, which, due to their specific activity in the digital environment, are preparing various models of algorithms, including those with application to public law relations and directly related to the application of state power²⁹. In view of their specificity, the algorithms should influence and change characteristics, even exclusive for the state spheres.³⁰ Who is the author of the algorithm and what is the control over its activity, if public law relations are affected? Possible answers for state control bodies, as in private law legal relations, or according

²⁷ Algorithmic modelling– represents modelling in the form of algorithm. Algorithmic models encapsulate data and procedures. They are realized as active processes in the computational environment of a graphic system. (See more at: Daan Kolkman, 'The Usefulness of Algorithmic Models in Policy Making' (2020) 37 *Government Information Quarterly* 101488 <<https://research.tue.nl/en/publications/the-usefulness-of-algorithmic-models-in-policy-making>> accessed 5 August 2022.

²⁸ Case C-36/02, *Omega Spielhallen und Automatenaufstellungs-GmbH v. Oberbürgermeisterin der Bundesstadt Bonn* (2004) ECR I-9609, 34. See Case C-112/00, *Eugen Schmidberger, Internationale Transporte und Planzüge v. Republik Österreich* (2003) ECR I-905; Case C-36/02, *Omega Spielhallen- und Automatenaufstellungs-GmbH v. Oberbürgermeisterin der Bundesstadt Bonn* (2004) ECR I-9609; Case C-341/05, *Laval un Partneri Ltd v. Svenska Byggnadsarbetareförbundet* (2007) ECR I-11767; Case C-438/05, *Viking Line ABP v. The International transport Workers' Federation, the Finnish Seaman's Union* (2007) ECR I-10779.

²⁹ In this sense is Giovanni De Gregorio, 'Digital Constitutionalism in Europe: Reframing Rights and Powers in the Algorithmic Society' [2022] *Digital Constitutionalism in Europe* <<https://www.cambridge.org/core/books/digital-constitutionalism-in-europe/A3F61C6368D17D953457234B8A59C502>> accessed 5 August 2022.

³⁰ David R Johnson and David Post, 'Law and Borders: The Rise of Law in Cyberspace' (1996) 48 *Stanford Law Review* 1367 <<https://www.jstor.org/stable/1229390?origin=crossref>>.

to the rules for damages caused by illegal state activity and private organizations.

The answer to these questions leads to a qualitatively new circumstance, which is improbable in the hypothesis that some external entity outside the circle of the constitutionally defined model of competent governing bodies could achieve such a tangible effect on the decisions-making process through ADM. As a result, a modification of the state functions is reached and the algorithmic environment is introduced into them, which is consistently and systematically reflected in the further identical situations resolutions. In this sense, without legal regulation, algorithmic solutions are starting to be applied, due to their speed, stability and efficiency, resembling the essence of legal custom³¹. The questions arise: Is the algorithm, algorithmic modeling legally permissible, and where do they derive their information and legitimacy? The question is also raised as to the nature of the new algorithmic legal relationship - public or private. This new order leads to the logical formulation of the increasingly widespread notion "algcocracy"³².

1.2.3. Algorithmic power

Algorithmic powers³³ are also part of the AS system. The last decade shows the significant impact of algorithms in many society spheres in a definitive way, because algorithms are applied numerous fields. Including in areas affecting the functioning and exercise of state power. At the same time, the power of the algorithm lies not only in the computer code, but also in the way it becomes part of the "normalization code". This means that algorithms are distinguished from the sovereign mode of exercising power³⁴. They are not exercised independently by the state, but in the form of public-private partnership.

³¹ David J Bederman, 'Custom as a Source of Law' [2010] Custom as a Source of Law 1 <<https://www.cambridge.org/core/books/custom-as-a-source-of-law/15BCBC96B32F0D228684D8157F8F533E>> accessed 5 August 2022.

³² Defined by John Danaher, 'The Threat of Algcocracy: Reality, Resistance and Accommodation' (2016) 29 Philosophy & Technology 2016 29:3 245 <<https://link.springer.com/article/10.1007/s13347-015-0211-1>> accessed 5 August 2022.

³³ Algorithmic power enables and constrains social action, it entails domination and counteractions, and it is practised – not possessed. Algorithms have become actors in society that shape how people live, love, and work. The power of algorithms can direct and redirect economic processes and influence how people's lives. Algorithms, in other words, exert and mediate power, enabling and constraining social action in a myriad of realms. See more at: Ferrari and Graham (n 16).

³⁴ Rik and Schuilenburg, Marc Peeters (ed), *The Algorithmic Society: Technology, Power, and Knowledge* (1st edn, Routledge 2020). p. 6.

Algorithmic powers are not regulated at the constitutional level. In the literature, there is the doctrine of implied powers, which originally arose in the US³⁵ and subsequently also in the Court of the European Communities practice³⁶. They don't limit to state powers but can be applied to them as well. This is a successful way to prove the emergence of algorithmic powers, because for the first time in the doctrine of constitutionalism, the main principles are formed based on information technology processes, and not on events and developing social processes. In this sense, algorithmic power cannot be seen directly as part of sovereignty. On the other hand, algorithmic decision-making in the public sphere is a continuation of decision-making without legal framework on matters that are of a constitutional nature. Therefore, algorithmic powers do not have a primary source of legitimacy such as state sovereignty³⁷ in the traditional relations. It is that part of sovereignty³⁸ that justifies algorithmic decision-making in the public sphere and in the corresponding constitutional order.

1.2.4. Algorithmic society

The algorithmic society³⁹ is the whole environment, starting from the algorithm, which is constantly changing its essence. It appears as a human-formulated solution implemented by the social environment in digital space. It organizes the solution of specific problems that develop simultaneously in both spaces - the virtual and the real. This society⁴⁰ could not be categorically

³⁵ 'The Doctrine of Implied Powers - IPleaders' <<https://blog.ipleaders.in/the-doctrine-of-implied-powers/>> accessed 5 August 2022.

³⁶ Case Commission v Council, C-22/70, EU:C:1971:23.

³⁷ 'Hermann Hauser, Founder of Arm: "Brexit Is the Biggest Loss of Sovereignty since 1066" | Technology Sector | The Guardian' <<https://www.theguardian.com/business/2022/jul/23/hermann-hauser-founder-of-arm-brexit-is-the-biggest-loss-of-sovereignty-since-1066>> accessed 5 August 2022.

³⁸ Gabriela Belova, 'Sovereignty and the European Constitutional Order' [2005] Contemporary Law 58.

³⁹ The algorithmic society features the collection of vast amounts of data about individuals and facilitates new forms of surveillance, control, discrimination, and manipulation, both by governments and by private companies. (See more at: Jack M Balkin, 'Free Speech in the Algorithmic Society: Big Data, Private Governance, and New School Speech Regulation' [2017] SSRN Electronic Journal <<https://papers.ssrn.com/abstract=3038939>> accessed 5 August 2022.

⁴⁰ According to Lars Vrielichner, 'Responsive Legal Pluralism: The Emergence of Transnational Conflicts Law' (2015) 6 <<https://doi.org/10.1080/20414005.2015.1092266>> 312 <<https://www.tandfonline.com/doi/abs/10.1080/20414005.2015.1092266>> accessed 5 August 2022. Detlef Von Daniels, *The Concept of Law from a Transnational Perspective* (Routledge 2016) <<https://www.routledge.com/The-Concept-of-Law-from-a-Transnational-Perspective/Daniels/p/book/9781138271234>> accessed 5 August 2022. Gralf-Peter Calliess and Peer Zumbansen, 'Rough Consensus and Running Code: A Theory of Transnational

separated from the real society because it offers solutions to its problems through algorithmic method⁴¹. Thus, the characteristics of a social problem are transferred from society to the digital space, which solves them and returns them again as a result to society. This flexibility, facing the social environment and the digital space is a characteristic feature of AS as a reflection of digital technologies.

1.2.5. Algorithmic governance

Algorithmic governances⁴² is a comprehensive and determined activity, with which the practical application of algorithms is achieved. The management of the algorithmic sphere requires a strategic approach in the implementation of the specific policies and the results achieved with them. Practically, algorithmic governance is the basis of e-governance⁴³. It is also an integral part of the modern state government. Amidst the Covid -19 pandemic restrictions, e-governance has succeeded in replacing the traditional form of governance by ensuring the functioning of society. Author raises the attention on the following understanding: „Algorithms may be used to prepare human decisions or to take them immediately through automated means. In fact, boundaries between human and automated decision-making are often blurred, resulting in the notion of “quasi - or semi-automated decision-making”⁴⁴. Algorithmic governance implies its systematicity and reflection in AS.

1.3. Algorithmic state as legal phenomenon.

Private Law’ [2010] Books <https://digitalcommons.osgoode.yorku.ca/faculty_books/188> accessed 5 August 2022. The algorithmic society should not be seen only as an isolated phenomenon, but as a piece of the puzzle in the process of globalization, which increasingly encourages the encounter and conflict of different legal systems and rationalities.

⁴¹ See 39.

⁴² Algorithmic governance may be defined as a form of social ordering that relies on coordination between actors, is based on rules and incorporates particularly complex computer-based epistemic procedures. It is situated at the intersection of digitalization, datafication, and governance through technology (See more at: James Wilsdon, *Digital Futures: Living in a Networked World* (1st edn, Routledge 2001). pp. 45-62.

⁴³ „E-Government is the application of information and communication technology (ICT) to deliver government services by integrating various stand-alone systems between government-to-citizen (G2C), government-to-business (G2B) and government-to-government (G2G) services” ‘What Is E-Governance | IGI Global’ <<https://www.igi-global.com/dictionary/cyber-capability-framework/8702>> accessed 19 November 2022.

⁴⁴ Committee of Experts on Internet Intermediaries (MSI-NET-CoE), “Algorithms and Human Rights: Study on the Human Rights Dimensions of Automated Data Processing Techniques and Possible Regulatory Implications, p. 3.

An algorithmic state is explained by the above elements, which together and separately give grounds for declaring its existence. Conceptually, these elements are debatable and should not be taken for granted. From a legal perspective, their understanding is necessary to explain the application of algorithms in the new digital legal environment⁴⁵. This is one of the characteristics as a legal phenomenon since it is impossible to predict how far the development of the regulatory framework and the adaptation of algorithms in public relations will reach. On the other hand, its flexible multivariation and multiaspect is the first stipulation that is valid in the structuring of AS in the field of its explanation and definition.

In this case, the possible solution from the digital constitutionalism⁴⁶ point of view is to build on the traditions of the state and adapt it to the algorithmic component, but not to leave it as an abstract concept without application, because that would be a retreat of law, an advance of technology and a denial of the digital legal order. Algorithms are not implemented in isolation. They influence social processes and the shape of society by defining it in a new type of space – hybrid considering the participation of individual and algorithm, and digital informational, including the application of new technologies in the information society⁴⁷.

⁴⁵ C. Stuurman, 'Digital Spaces, Digital Rules' (2022) 7 Tilburg University 343 <<https://research.tilburguniversity.edu/en/publications/digital-spaces-digital-rules>> accessed 21 November 2022. p.5-6

⁴⁶ Ingolf Pernice, 'Multilevel Constitutionalism and the Crisis of Democracy in Europe' (2015) 11 European Constitutional Law Review 541.

⁴⁷ The term information society is fundamental to the algorithms, because the Internet is one of the dimensions and one of the reasons for the impact of information technologies on the society of people and respectively on the law, as a regulator of social relations, which are modified from the point of view of essence, as they do not are only social between members of society, but are hybrid, involving a qualitatively new type of legal relationship, human-inventor of an algorithm, applying the invented operations in relation to the physical person. The enormous influence of the Internet in its varieties:

- Internet 1.0 (Web 1.0 was a read-only web. Web 1.0 was static and mono-directional. Defined by Sareh Aghaei, 'Evolution of the World Wide Web : From Web 1.0 to Web 4.0' (2012) 3 International journal of Web & Semantic Technology 1.
- Internet 2.0 (Web 2.0 is also known the wisdom web, people-centric web, participative web, and read-write web. With reading as well as writing, the web could become bi-directional. Web 2.0 is a web as a platform where users can leave many of the controls they have been used to in web 1.0.)
- Internet 3.0 (Web 3.0 is also known as semantic web. Semantic web was thought up by Tim Berners-Lee, inventor of the World Wide Web. Web 3.0 tries to link, integrate, and analyse data from various data sets to obtain latest information stream; It can improve data management, support accessibility of mobile internet, simulate creativity and innovation, encourage factor of globalization phenomena, enhance customers' satisfaction, and help to organize collaboration in social web. See more at: Pranay Kujur and Bijoy Chhetri, 'Evolution

1.3.1. Traditional state vs. algorithmic state

Another particularly important question of pragmatic importance for considering the problem is: Is AS a state and does its definition as a state give grounds to speak of a separation of legal personality and independent existence from the state? The traditional state is a concept with which we denote the state as a legal and political entity with legal personality, capacity to act and capacity to delict. From law point of view, the state is also explained by its structural elements⁴⁸ - territory, population, sovereignty⁴⁹ and recognition⁵⁰.

Understanding the content of the State is a social phenomenon. Several levels of existence are inherent in any social community. These levels are three: substantive, attributive, and institutional. At the substantial level of the social community, its essence is the people. At this level, it exists as a collection of interconnected and interacting individuals, members of a whole. The attributive level, the attribute of social matter, is the interpersonal and intergroup relations that arise because of people's interactions. At this level, the social community is a system of social relations and connections between its members. The institutional level of the social community, its institutions are a system of organs and mechanisms that mediate and direct the social activity of individuals. At the institutional level, the social community exists through its institutions. Based on the analysis above, the author makes following distinction between the traditional state and AS:

Distinguishing criteria	Traditional state	Algorithmic state
Basic elements	Population, territory, sovereignty	Digital environment, algorithms, users

of World Wide Web: Journey From Web 1.0 to Web 4.0' 6 International Journal of Computer SCienCe and teChnology.

- Internet 4.0 (Web 4.0 is also known as symbiotic web. Web 4.0 will be the read-write-execution-concurrency web. It achieves a critical mass of participation in online networks that deliver global transparency, governance, distribution, participation, collaboration into key communities such as industry, political, social, and other communities. See more at: Christian Bizer, Tom Heath and Tim Berners-Lee, 'Linked Data - The Story so Far' (2009) 5 International Journal on Semantic Web and Information Systems 1.

⁴⁸ Chandran KUKATHAS, 'A Definition of the State' (2014) 33 University of Queensland Law Journal <https://ink.library.smu.edu.sg/sooss_research/2917> accessed 5 August 2022.

⁴⁹ Frank Pasquale, 'From Territorial to Functional Sovereignty: The Case of Amazon | OpenDemocracy' <<https://www.opendemocracy.net/en/digitaliberties/from-territorial-to-functional-sovereignty-case-of-amazon/>> accessed 5 August 2022.

⁵⁰ Montevideo Convention on the Rights and Duties of States, Art. 1 . Available at <https://www.jus.uio.no/english/services/library/treaties/01/1-02/rights-duties-states.xml>.

Institutions/subjects	State authorities/state power	High-tech companies in ICT
Regulation method	Public Law	Private Law
Characteristics	Traditions, stability and conservatism	Dynamics with the rhythm of technology, not with the society
Legal approach to personal data	Personal data as a right - protection of personal data	Personal data, resource, Use, processing and storage
Control	Established institutions of the state authority for control and responsibility realization	They are still developing and there is no model for combining public and private law
Legal framework	Detailed legislation	Under development
Representation	State bodies for external relations, membership in international organizations	Digital environment and lack of a systematic approach on legal personality
Interaction options	In the traditional state AS should be integrated as part of the statehood.	The only approach is the inclusion of AS to the traditional one. Otherwise, it couldn't exist independently.

1.3.2. Potential definition

AS could not exist without its application in the traditional state. The basic conclusion is that theoretically it could be assumed that it exists independently, but on the other hand this statement cannot be supported, because if it exists independently of the traditional state, there is no way to apply it and its structural elements as a separate state.

In the traditional state, legitimacy follows from the sovereign, while in AS it derives from a human-made algorithm. At the same time, there is no concept that would put a collective focus between the legitimacy of the traditional state and AS. While with the traditional state and contemporary constitutionalism⁵¹ there are centuries-old traditions, with the algorithmic one

⁵¹ Georgi Bliznashki, 'Evolution of the Notion of Constitutionalism' [2016] Contemporary Law 7.

the question is debatable, but it must be presumed. Due to the effectiveness and wide application of AS, and through the algorithms, it penetrates an unlimited number of public relations' spheres, which raises the question: wherever possible is this method used and should it be applied without a thorough legal assessment of its impact? It is necessary to arrange a restrictive, but not limiting, approach to the application of AS, because due to its effectiveness and lack of clear form, it could subtly push the traditional state out of its typical functions. This could lead to a change in social reality. The strengthening of ADM through the application of AI is a prerequisite for the disruption of the balance between a traditional and AS.

The conclusion is that the traditional and algorithmic state exist in parallel, and there is a conditioned mutual relationship between them. The difference is that AS's impact stems from digital ICT, which in no way can be equated to the socio-political events characteristic of the previous periods that argued for constitutional change.

The author also suggests another possible understanding, but it cannot be supported unconditionally. It is that AS could function separately from the traditional state. It can be applied within the scope and content of the state. Moreover, it can amend and complement the modern state, because the functioning of modern society without algorithms is inconceivable. On the other hand, there is a risk that the lack of their comprehensive and complete regulation will lead to a "legal vacuum". So, the latter is a prerequisite for violating human rights and basic functions of society.

In summary AS is part of the spatial dimensions and structural elements of the traditional state. The arguments for this are that it exists in parallel, but not as a parallel independent state, because the population and territory of the country cannot be extrapolated to both the state and AS. The algorithm influences society, and society influences through its readiness and receptivity to allow the application of algorithms in new significant areas of state competence. At the same time AS cannot not have the corresponding spatial changes. They must be admitted, but within the respective country.

So, the proposal for a potential definition is: "AS is an abstract concept, which reflects information and digital technologies with algorithms in the center. They, as a coherent system (containing an algorithm, powers, society, governance) lead to the recognition of the algorithmic type of state, through which more than one problem or overall question is solved. AS introduces in a systematic and digital form certain spheres which are functions of the state power. They, without having a constitutional legal system, acquire a digital application, even in relation to the functions of state power, and a specific source of public law legitimacy, different from that of political representation established in the traditional state".

1.4. AS in the context of Constitutional and EU Law

The structure of the digital society and the consolidation of the basic principles⁵² and political understandings are an intrinsic function of constitutionalism⁵³, because due to the supreme legal force, the most important principles and principles of society are reflected in the constitution of a country. The doctrine of constitutionalism is the reflection of the society's development level. Part of the main questions before the Constitutional Law⁵⁴ are how to settle the algorithms, ADM, and algorithmic powers. There is currently no consensus on constitutional amendments to the constitutions of individual sovereign states. There is optimism and the beginning of a trend for change such as personal data legislation, which has also been introduced because of the influence of digital technologies in public life. The protection of personal data received legal regulation in Charter of Fundamental Rights of the EU (CFREU) as part of the catalog of human rights⁵⁵. Here, any sovereign state will be very careful of the debate on the emerging new generation of information rights and their incorporation into constitutions. The author believes that there are several possible solutions. First, sovereign states that would strongly support information rights as part of the catalog of human rights at the constitutional level. Secondly, countries where the discussion would be longer about the need to include them as new human rights. A third group of countries in which consensus cannot be reached at the constitutional level but will practically implement the algorithmic reality based on normative acts outside the constitution of a respective sovereign state.

It is characteristic of the Constitution that amendments are introduced only in clear cases, which reflect a necessary and conscious amendment. This is exactly the case with AS. The incorporation of AS should be transferred from the society to the agenda of the doctrine of constitutionalism. In this sense AS is a reality that would influence constitutions and constitutional traditions⁵⁶.

⁵² Plamen Kirov, 'The Evolution of Constitutional Principles', *Application of constitutional principles in public and private law. [Collection of reports from the jubilee international Scientific Conf. "25 years of the Faculty of Law of VTU 'St. St. Cyril and Methodius' and (2017).*

⁵³ Pollicino and others (n 27).

⁵⁴ Jean-Jacques Rousseau and others, *The Social Contract; and the First and Second Discourses* (Susan Dunn ed, Yale University Press 2002) <<https://www.jstor.org/stable/j.ctt1npwsh>> accessed 5 August 2022. p. 315.

⁵⁵ Igor Calzada, 'Technological Sovereignty: Protecting Citizens' Digital Rights in the AI-Driven and Post-GDPR Algorithmic and City-Regional European Realm' [2019] Regions.

⁵⁶ Martin Belov (ed), *The IT Revolution and Its Impact on State, Constitutionalism and Public Law* (Hart Publishing 2021).

The AS is not a typical and characteristic sphere of the constitutions scope and constitutional law, but due to its unlimited application in almost all spheres of society, its modification is observed. Algorithms change a greater part of traditional institutions, which are no longer of the same content and form of legal regulation compared to their original form of legal regulation. All this is a prerequisite and proves the need for constitutional law to accept algorithms as a legitimate method affecting law and society, but under clearly defined conditions and constitutional guarantees for the protection of human rights⁵⁷. There is a danger that if these processes are allowed to develop without any constitutional control, it will lead to the depersonalization of the human being. Algorithms limit, downplay and under-develop human creativity and senses. Also, the Internet affects people's social behavior⁵⁸. On the one hand, they stimulate the thought processes of those who create them but have no creative influence on the mass of people who are their end users.

The algorithm also affects a person's behavior without realizing it. Prolonged exposure to the influence of different algorithms in terms of type and purpose is capable of leading to the formation of certain evaluations, to prompting a person to certain behavior or to the absence of such behavior.

The answer to the question of the responsibility that should be borne in the presence of a unethical human-made algorithm or in the case of an algorithm whose behavior as a result of an error or technical malfunction causes harm to natural persons is also logical. In these situations, control could not be assigned to another algorithm, since only natural persons can be the bearers of responsibility, in which case they must also exercise control⁵⁹. Regardless of the rapid development of new technologies, the human factor cannot and should not be denied, since in several hypotheses it is the guarantee of the effective functioning and good management of AS.

⁵⁷ Jean-Marc Van Gyseghem, 'Fundamental Rights and the Use of Artificial Intelligence in Court. In *The Cambridge Handbook of Lawyering in the Digital Age*' in G. Balint and others (eds), *book section* (Cambridge University Press 2021) <<https://sbc.org.pl/dlibra/publication/99008/edition/93276/synteza-i-aktywnosc-biologicznawych-analogow-tiosemikarbazonowych-chelatorow-zelaza-serda-maciej?language=en>> accessed 5 August 2022. pp. 257.

⁵⁸ Franklin Foer, 'Facebook's War on Free Will | Technology | The Guardian' <<https://www.theguardian.com/technology/2017/sep/19/facebooks-war-on-free-will>> accessed 5 August 2022. How Mark Zuckerberg outlines: „in many ways, Facebook is more like a government than a traditional company“.

⁵⁹ In this respect see Diana Kovatcheva, 'How Long Shall Man Be the Measure of All Things? Artificial Intelligence Systems and the Protection of Human Rights: Overwhelming Risks or Beneficial Opportunities?' 30 *Economic Alternatives Review*. According to Kovatcheva "Ethical oversight is not a mechanism for evaluating the performance of AI, it is seen as a possible solution that reviews and evaluates algorithm decisions for lack of objectivity, transparency and possible harm".

The digital environment is also not regulated in the areas of competence of the EU. At the same time, legislative acts are adopted⁶⁰ or legislative proposals are developed within the framework of the European Union⁶¹ and the Council of Europe, related to studies on the application of AI, cloud technologies, e-government, and the digital environment⁶². This is a new paradigm before which Constitutional law is placed, because it is the brightest form of public law, but it is obvious that in these processes decisions and models are not initiated by state bodies and representatives of state power, but by private entities⁶³ with a huge impact on the technological environment and society.

If we allow the algorithmic element to be recognized as part of modern statehood, its timely settlement is required in the following ways:

- With the inclusion of this matter in the Constitutions of individual EU member states.
- With a revision of the Treaty of Lisbon and a clearer formulation of the digital environment in which AS develops.
- By adding a protocol to the Treaty of Lisbon or a stand-alone act at EU level as part of EU primary law.

It probably cannot be all algorithms, as neither is logical, let alone justified. Certainly, in this category should fall those algorithms that affect constitutional rights. Their benefit is obvious, and they can be applied much more widely only if the protection of human rights and standards for their

⁶⁰ The European Commission proposed two legislative initiatives to upgrade rules governing digital services in the EU: the Digital Services Act (DSA) and the Digital Markets Act (DMA). The Commission made the proposals in December 2020 and on 25 March 2022 a political agreement was reached on the Digital Markets Act, and on 23 April 2022 on the Digital Services Act.

⁶¹ COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Shaping Europe's digital future COM/2020/67 final.

⁶² European Commission for the efficiency of justice (CEPEJ) European ethical Charter on the use of Artificial Intelligence in judicial systems and their environment, available <https://rm.coe.int/ethical-charter-en-for-publication-4-december-2018/16808f699c>, Adopted at the 31st plenary meeting of the CEPEJ (Strasbourg, 3-4 December 2018).

⁶³ Jordan Novet, 'Pentagon Asks Amazon, Google, Microsoft, Oracle for Cloud Bids' <<https://www.cnbc.com/2021/11/19/pentagon-asks-amazon-google-microsoft-oracle-for-cloud-bids.html>> accessed 5 August 2022. The Pentagon's request to Amazon, Google, Microsoft, and Oracle for bids on cloud contracts is a clear example of the critical role of public-private partnership where public and private values inevitably merge in a hybrid contractual framework.

observance are ensured⁶⁴. If this is not done, the democratic foundations⁶⁵ of society can be changed by influencing the elections, as a form of direct democracy⁶⁶, where instead of hearing the voice of the people, the "voice of the algorithm" is heard, and people become an instrument of this voice⁶⁷.

1.5. Conclusion

Algorithms and ADM are a reality, which soon will be objectified in the legal reality in the context of Constitutional and EU Law. Algorithms enter people's lives and participate in the management of social processes. It is impossible that large-scale algorithmic activity, penetrating all spheres of society. It is law that should be the regulator of an atypical sphere, combining the interests of society and its connection, through the transfer of certain spheres and processes from the real to the digital space. The leading goal of the legal regulation is to ensure the functioning of AS as a part of the modern state at the constitutional level, and on the other hand to prevent the lagging behind the law and the development of society in the dynamics with which the algorithms develop in the digital environment. The proposed version of the concept of the functioning of the AS is only the first stage of the provision of this legal framework. This change should put individuals at the center of algorithmic functioning processes while strictly respecting human rights and actively applying a human-centered approach in the digital environment. Constantly developing discussions and adopted acts in the EU give reason to conclude that algorithms will be a new part of the legislation of the EU and its member states. A strategic goal for the EU is to support the development of

⁶⁴ See Diana Kovatcheva, 'The New Subjects of Law - Are Artificial Intelligence Systems Already among Us?' *De Jure*. According to the author "For this reason, the initial AI algorithms are fundamental and should contain clear rules that underlie the development of intelligent machines. These algorithms set the standards in the work of robots, for example, the principle that they should not harm the person or violate the basic human rights, or that rules regarding the processing and storage of personal data should be developed transparently. These rules contribute to the avoidance of risks to harm people and their rights and should be designed in such a way that they cannot be changed, regardless of the opportunities for self-learning and upgrading of the systems with artificial intelligence. These algorithms should be stable and be "locked" or "frozen" and prohibited from changes by the AI in the context of their upgrade and self-learning.

⁶⁵ Sunimal Mendis, 'Democratic Discourse in the Digital Public Sphere: Re-Imagining Copyright Enforcement on Online Social Media Platforms' [2022] *Perspectives on Digital Humanism* 41 <https://link.springer.com/chapter/10.1007/978-3-030-86144-5_6> accessed 21 November 2022.

⁶⁶ Plamen Kirov, 'On the Merits of Direct Democracy' (2018) 9 *De Jure* 125.

⁶⁷ 'Cambridge Analytica and Facebook: The Scandal and the Fallout So Far - The New York Times' <<https://www.nytimes.com/2018/04/04/us/politics/cambridge-analytica-scandal-fallout.html>> accessed 5 August 2022.

the concept of the AS, because it consists of 27 member states. It is obvious that the integrative approach of sovereignty transfer can be extended to the algorithmic realm. In this way, the EU has a potential opportunity to establish itself as one of the centers behind the technological sovereignty of its member states. This circumstance will make the EU one of the key actors in the development and implementation of algorithmic legal regulation. It would be a natural extension of the fact that the EU was able to establish itself as one of the leaders for the personal data protection, preserving the possibility of algorithms developing.

In summary, AS appears because society begins to organize its activity, moving from traditional forms of governance to algorithmic forms in the digital space. This is an early stage of AS, but there is a reason to believe that it will continue to develop and will not remain in its current form but will deepen. This is suggested by the digital environment adding new features to its application in a short period and shows the flexibility for the adaptability of technologies in the AS. Practically, these are the future forms of the socially realized complex digital environment.