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Is the Traditional Method of Regulation (the Legislative Act) Sufficient to Regulate Artificial Intelligence, or Should It Also Be Regulated by an Algorithmic Code?

Abstract: The issue of the regulation of artificial intelligence (AI) is one of the significant challenges faced by the EU at present. Most researchers focus on the substantive scope of AI regulation, including state law, ethical norms and soft law. In addition to the substantive and legal scope of the regulation, it is worthwhile considering the manner of such regulation.[1] Since AI is an algorithmic code, it seems correct to regulate (restrict) AI not so much with traditional law established in natural (human) language as with one implemented into algorithms. They may operate as a tool supporting traditional legislation (RegTech), but it is possible to go further with the issue and create regulation algorithms which implement the law as the effective law. However, this requires a new approach to law and legislation – the law as algorithmic code.

Keywords: AI, AI ecosystem, AI regulation, Algorithm, law as IT code, RegTech, LegalTech

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1   In an earlier publication, the author referred to smart contracts as a method of regulation: D. Szostek, Sztuczna inteligencja a kody. Czy rozwiązaniem dla uregulowania sztucznej inteligencji jest smart contract i blockchain? (in:) L. Lai and M. Świerczyński (eds.), Prawo Sztucznej Inteligencji, Warsaw 2020, p. 15ff. This article is an extension of the original idea.

Introduction

Both the documents[2] and the statements of science[3] and practice refer to the significance of the development of a digital economy based on artificial intelligence (AI), with simultaneous identification of the risks and dangers related thereto.[4] AI is a challenge to economies, states and contemporary law and the manner of its application.[5] One of the recurring issues in the scientific discussion is artificial intelligence regulation.[6] The question is not only about the issue of the scope of the subject matter of the regulation[7] but also the manner of regulation. The traditional

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2   Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions on Artificial Intelligence for Europe, Brussels (COM(2018) 237), 25.04.2018, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM% 3A2018%3A237%3AFIN; The High-Level Expert Group on Artificial Intelligence European Commission Directorate-General for Communications Networks Technology, 20.09.2018; Recommendation No. 2102 (2017) about technological convergence, artificial intelligence and human rights (Doc. 14432); Declaration by the Committee of Ministers on the manipulative capabilities of algorithmic processes, 13.02.2019,; European Commission For The Efficiency Of Justice, European Ethical Charter on the use of artificial intelligence in judicial systems, Guidelines on Artificial Intelligence and Data Protection T-PD(2019)01, 14.04.2021,.

3   N.D. Wright (ed.), Artificial Intelligence, China, Russia, and the Global Order, Maxwell 2019, p. 2ff.; S. Feldstein, The Global Expansion and AI Surveillance, Washington 2019, p. 5ff. See also National AI Strategies.

4   Australian Government, Artificial Intelligence: Solving problems, growing the economy and improving our quality of life, 20.12.2019, https://data61.csiro.au/en/Our-Research/Our-Work/AI-Roadmap; Executive Office of the President of the United States, 2016–2019 Progress report: Advancing artificial intelligence R&D (November 2019), https://www.whitehouse.gov/wp-content/uploads/2019/11/AI-Research-and-Development-Progress-Report-2016–2019.pdf (accessed 09.04.2021); National Artificial Intelligence Strategy of the Czech Republic, https://www.mpo.cz/assets/en/guidepost/for-the-media/press-releases/2019/5/NAIS_eng_web.pdf (accessed 14.04.2021); EU guidelines on ethics in artificial intelligence: Context and implementation, https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/640163/EPRS_BRI(2019)640163_EN.pdf (accessed 31.03.2021); Responsibility and AI: Council of Europe study, 21.12.2019, https://rm.coe.int/responsability-and-ai-en/168097d9c5.

5   European Artificial Intelligence (AI) leadership, the path for an integrated vision https://nws.eurocities.eu/MediaShell/media/European_AI_study.pdf (accessed 20.04.2021).

6   White Paper On Artificial Intelligence. A European approach to excellence and trust, COM(2020) 65 final, European Commission, https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf (19.04.2019).

7   I suggest reading interesting recommendations concerning liability issued by EU experts: Liability for Artificial Intelligence and other emerging digital technologies: Report from the Expert Group on Liability and New Technologies – New Technologies Formation, https://ec.europa.eu/transparency/regexpert/index.cfm?do= groupDetail.groupMeetingDoc&docid=36608 (accessed 12.04.2021).

method of AI regulation is necessary but seems to be insufficient.[8] Increasingly often, modern law applies the tools of LegalTech[9] and RegTech[10] to support the processes of the analysis or application and even enforcement of law.[11] In reality, regulating AI only with the text of a legal act is so complicated that it is very difficult, if not impossible, to reach it through a traditional way of lawmaking. At the most, it may be a way of imposing rights and obligations that will have to be taken into account on the entities teaching or using AI in the process of AI coding or teaching, and thus finally effecting the transformation of law into codes.

Therefore, it is necessary to formulate the following hypothesis: Since AI is an algorithm, then the method of its regulation should be the use of an algorithm comprising legal standards. The question is, Should such an algorithm be a RegTech tool supporting traditional legislation, or should it be the law incorporated into the code? Who should create and enforce such algorithms? Should it remain the domain of private entities that use or teach AI, or the domain of states or maybe of the European Union? And who is to control the AI-regulating algorithms and ensure their cybersecurity?

It is not possible to include all the regulation aspects of AI in such a short publication. The issue requires separate and in-depth scientific research and a separate monograph.[12] The goal of this article is to prove that the hypothesis formulated above is correct and to answer the above questions. At the least, the article is just a contribution to the discussion of AI regulation. The author deliberately passes over the issue of the substantive layer[13] of AI regulation and concentrates on the

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8   https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupMeetingDoc &docid=36608 (accessed 20.04.2021).

9   The goal of this article is not the analysis of the definition of LegalTech or RegTech. For more, see M. Hartung, M. Bues and G. Halblieb, Legal Tech, Baden-Baden 2018, p. 11ff.

10   Compare the issue of the term and application of RegTech in T. Kerikmäe (ed.) Regulating eTechnologies in the European Union. Normative Realities and Trends, Cham 2014, p. 7ff. See also Recommendations on regulation, innovation and finance: Final Report to the European Commission, 01.12.2019, p. 27ff., https://ec.europa.eu/info/sites/info/files/business_economy_ euro/banking_and_finance/documents/191113-report-expert-group-regulatory-obstacles-financial-innovation_en.pdf. The analysis of the scope of the terms of LegalTech and RegTech exceeds the scope of this article.

11   R. Leens, Regulating New Technologies in Times of Change, (in:) L. Reins (ed.), Regulating New Technologies in Uncertain Times, Cham 2019, pp. 3–19; D. Szostek (ed.), Legal Tech. Czyli jak bezpiecznie korzystać z narzędzi informatycznych w organizacji, w tym w kancelarii oraz dziale prawnym, Warsaw 2021, p. 3ff.

12   See: D.E. Harasimiuk and T. Braun, Regulating Artificial Intelligence. Binary Ethics and the Law, London/ New York 2021, p. 1ff.

13   Compare: On factual regulation: Documents of the European Commission, https://ec.europa.eu/ info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf; M. Chinen, Law and Autonomous Machines, Cheltenham 2019, p. 2ff.; J. Turner, Robot Rules. Regulating Artificial Intelligence, Cham 2019, p. 133ff., where the author specifies different law aspects

analysis of whether it is sufficient for the correct AI regulation to have traditional legal provisions created and published in a natural language or whether an algorithm should be applied (we can call it the regulation algorithm) which implements the said provisions within its scope. If so, then whoever creates and controls it, and whether it should be something like a RegTech tool supporting traditional regulation or whether as code, it should become the effective law.

The terms AI, codes or algorithms bring a lot of doubt in the scholarship, deepened by the European Commission's proposed Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence and amending certain union legislative acts (the AI Act),[14] where (in the annexe) AI is very broadly defined to include not only self-learning algorithms, but, more broadly, expert systems as well. International legal scholarship distinguishes three types of AI – algorithms, expert systems and machine learning.[15] This concept is highly underdefined, as is the definition of an algorithm, which can take various forms. It also has no uniform definition.[16] The problem of definition alone is very broad and lends itself to separate studies much broader than the framework of a single article. The aim of this publication is the question of the method of regulation and not its scope or the solution of definition problems. Therefore, for its purposes, some simplifications are assumed without going into conceptual issues.[17] The following considerations concern the so-called self-learning algorithms (for the purposes of this article included under the general term AI).

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for AI, both orders and prohibitions in relation to human rights or individual law systems, but also thinks of the law only and exclusively for AI, similar to how we have rights for animals. Examples of material solutions are: Report with recommendations to the Commission on a civil liability regime for artificial intelligence (2020/2014(INL)), https://www.europarl.europa.eu/doceo/document/A-9–2020-0178_EN.html (accessed 20.04.2021); Artificial Intelligence (AI): new developments and innovations applied to e-commerce, https://www.europarl.europa.eu/thinktank/en/document.html?reference=IPOL_IDA(2020)648791 (accessed 20.04.2021).

14 Proposal For A Regulation Of The European Parliament And Of The Council Laying Down Harmonised Rules On Artificial Intelligence (Artificial Intelligence Act) And Amending Certain Union Legislative Acts Com/2021/206 Final, https://Eur-Lex.Europa.Eu/Legal-Content/EN/TXT/?Uri=CELEX:52021PC0206 (accessed 19.07.2021).

15 W. Barfield and U. Pagallo, Law and AI, Cheltenham/Northampton 2020, pp. 19–23; R. Prabucki, D. Szostek and J. Wyczik, Prawo jako kod, (in:) D. Szostek (ed.), Legal Tech, *op. cit.*, p. 21.

16 *Ibidem*, p. 17ff., and the literature cited therein.

17 In Polish scholarship, compare: A. Krasuski, Status sztucznego agenta. Podstawy prawne zastosowania sztucznej inteligencji, Warsaw 2021, p. 3 ff.; L. Lai and M. Świerczyński (eds.), Prawo Sztucznej Inteligencji, *op. cit.*, p. 1ff.

1. Incorporation of Law into Codes

Artificial intelligence is a specific algorithm which may itself take decisions independently and 'learns' in closed or open ecosystems.[18] AI is characterised by variability, activity and the ability to interpret the collected structured or unstructured data, to draw conclusions from the knowledge obtained from data and to select the best actions to achieve the goal. In other words, AI is able to learn.[19] The regulation concerning restrictions for AI should take this characteristic into account. In other words, while learning, AI should take into account the restrictions (that is, the law) imposed on it.[20] AI does not have any possibility to consider the restrictions of law published in natural language in traditional legislation. Yet it would be possible if the law concerning AI was implemented into algorithmic codes.[21]

L. Lessig's concept[22] that code is law and the legal system is composed of 'puzzles' which can be combined with one another and formed in cyberspace, among others, has become the reality nowadays. It is no longer a theoretical concept but has the form of actually implemented projects where the human language – used thus far to notify the legal rules to be observed by the society – is replaced with the programming codes readable by machines equipped with processors and directly

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18 More about the definition and characteristics of AI can be found in J. McCarthy, M. L. Minsky, N. Rochester and C.E. Shannon, A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence http://jmc.stanford.edu/articles/dartmouth/dartmouth.pdf (accessed 20.04.2021): 'every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it'; A. Turing, Computing Machinery and Intelligence, "Mind" 1950, vol. 49, no. 236, p. 433, https://www.cse-e.umbc.edu/courses/471/papers/turing.pdf (accessed 20.04.2021); Collins Dictionary: "Artificial intelligence is a type of computer technology which is concerned with making machines work in an intelligent way, similar to the way that the human mind works"; Merriam-Webster Dictionary: "the capability of a machine to imitate intelligent human behaviour"; Communication from the Commission, *op. cit.*; HLEG AI Definition 2018: The European Commission's high-level expert group on artificial intelligence, A definition of AI: Main capabilities and scientific disciplines. Definition developed for the purpose of the deliverables of the High-Level Expert Group on AI, Brussels, 18.12.2018, https://ec.europa.eu/digital-single-market/en/news/definition-artificial-intelligence-main-capabilities-and-scientific-disciplines. See also the definition from May 2019 in the Recommendation of the Council on Artificial Intelligence, OECD, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449.

19 For more, see: T. Zalewski, Definicja sztucznej inteligencji, (in:) L. Lai and M. Swierczyński (eds.), Prawo Sztucznej Inteligencji, *op. cit.*, pp. 11–12.

20 For more about AI learning, see: M. Tegmark, Życie 3.0. Człowiek w Erze sztucznej Inteligencji, Warsaw 2019, p. 111ff.

21 This is not the first such postulation in scholarship. In 2018, such a need was pointed out by K. Werbach, in The Blockchain and the New Architecture of Trust, London 2018, pp. 1–7.

22 L. Lessig, Code and Other Laws of Cyberspace, New York 1999, p. 3ff.

executed by them.[23] Such a process is carried out without the transcription of a computer code into symbols, letters, words, phrases and sentences, in a manner that cannot be directly perceived by humans.[24] A legal provision or a contract starts to operate as a computer program and not as a text including legal provisions composed of letters and grammatical characters presented in natural language.[25] Law and technology interact[26] with each other increasingly intensively through a complex system of relations and correlations, as both of them contribute to the regulation of the behaviour of entities such as individuals, where the law regulates such behaviour as the system of orders and prohibitions, while the programming codes regulate the actual restrictions[27] on the freedom of those who use it in cyberspace.[28] Thus far, the codes have mainly restricted the freedom of people operating in cyberspace. Why can they not restrict other codes, such as AI? Code is the architecture of cyberspace, and pieces of code are the construction material of such architecture. Everything we see online is delivered through a code; only a code can allow the presence of social rules in cyberspace. Thus, the code also functions as a regulator.[29]

The functions of codes in cyberspace are described in a similar manner by Lessig. He claims that cyberspace is not entirely a zone of full liberty but is regulated. The author states that 'This regulator is code – the software and hardware that make cyberspace as it is. This code, or architecture, sets the terms on which life in cyberspace is experienced. It determines how easy it is to protect privacy, or how easy it is to censor speech. It determines whether access to information is general

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23   See: M. Araszkiewicz, Algorytmizacja myślenia prawniczego. Model, możliwości ograniczenia, (in:) D. Szostek (ed.), Legal Tech, *op. cit.*, p. 55ff.

24   Attention was drawn to it in the literature as early as 2002; see: A. Wiebe, Die elektronische Willenserklärung, Tubingen 2002, p. 350; D. Szostek, Czynność prawna a środki komunikacji elektronicznej, Krakow 2004, p. 39. See also: W. Cyrul, LegalTech a tworzenie i publikacja tekstów prawnych, (in:) D. Szostek (ed.), Legal Tech, *op. cit.*, p. 88ff.

25   More on the transcription of spoken language into algorithmic codes is in: M. Araszkiewicz, Algorytmizacja, *op. cit.*, p. 55.

26   An example includes the analysis of the correct implementation of 42 directives in Ireland, Luxembourg and Italy performed by an expert system; see: R. Nanda, G. Siragusa, L. Di Caro, G. Boella, L. Grossio, M. Gerbaudo and F. Costamanga, Unsupervised and Supervised Text Similarity Systems for Automated Identification of National Implementing Measures of European Directives, "Artificial Intelligence and Law" 2019, vol. 27, p. 1999ff. Also see: R. Boulet, P. Mazzega and D. Bourcier, Network Approach to the French System of Legal Codes, part II: The Role of the Weights in a Network, "Artificial Intelligence and Law" 2018, vol. 26, p. 23ff.

27   The transformation of law into programming codes is a new scientific discipline which combines law and computer science and thus creates so-called LegalTech. See: S. Schrebak, Integrating Computer Science into Legal Discipline: The Rise of Legal Programming, pp. 1–33, https://papers.ssrn.com/sol3/papers.cfm? abstract_id=2496094 (accessed 22.09.2019); M. Corrales, M. Fenwick and H. Haapio, Legal Tech, Smart Contracts and Blockchain, Singapore 2019, p. 5ff.

28   W. Szpringer, Blockchain jako innowacja systemowa. Od Internetu informacji do Internetu wartości, Warsaw 2018, p. 40.

29   S. Schrebak, Integrating Computer Science, *op. cit.*, p. 4.

or whether information is zoned. It affects who sees what, or what is monitored and invisible. Code regulates cyberspace in ways that one cannot begin to see unless one begins to understand the nature of this code. The code of cyberspace is changing. And as this code changes, the character of cyberspace will change as well.'[30] G. Wood puts it similarly in his work, indicating that cryptography makes it possible to implement law into codes. In the terms of his concept, crypto-law is characterised by the fact that it is possible to implement legal rules known from traditional law into codes in a highly secured cryptographic space. The moment when this became possible is the development of blockchain technology.[31] A similar possibility is indicated by M. Hildebrand, who asks to what extent algorithmic regulation could replace or support legal regulation.[32]

Cyberspace is an artificial creation operating through software.[33] AI is an algorithmic code constituting an element of cyberspace, and therefore it could be regulated through the same technique, that is, through the codes with legal regulations implemented into them. Cyberspace is dynamic and undergoes continuous changes. AI is also dynamic and undergoes continuous changes, and therefore the method of regulation should also be subject to dynamism,[34] to appropriately adapt to changing social relations[35] and take into account different spaces and legal systems. In other words, the process of AI teaching or AI learning should take into account the legal restrictions imposed on it, which may be achieved either through appropriately created data ecosystems or through appropriate algorithms with legal regulations (restrictions) for AI implemented into them.

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30   L. Lessig, Code is Law: On Liberty in Cyberspace, "Harvard Magazine", https://harvardmagazine. com/2000/ 01/code-is-law-html (accessed 19.04.2021).

31   G. Wood, Ethereum: A Secure Decentralized Generalized Transaction Ledger (EIP-150 revision), http://gavwood.com/Paper.pdf (accessed 19.07.2021), See: also R. Prabucki, D. Szostek and J. Wyczik, Prawo jako kod, *op. cit.*, p. 23; Compare M. Hildebrandt, Smart Technologies and the End(s) of Law, Northampton 2016, p. 1ff.

32   M. Hildebrandt, Algorithmic Regulation and the Rule of Law, 'Philosophical Transactions of the Royal Society A' 2018, vol. 376, issue 2128, https://royalsocietypublishing.org/doi/10.1098/ rsta.2017.0355 (accessed 19.07.2021).

33   L. Lessig, Code and Other Laws, *op. cit.*, p. 82.

34   M. Fenwick, E.P.M. Vermeulen and M. Corrales, Business and Regulatory Responses to Artificial Intelligence: Dynamic Regulation, Innovation Ecosystems and the Strategic Management of Disruptive Technology, (in:) M. Corrales, M. Fenwick and Nikolaus Forgó (eds.), Robotics, AI and the Future of Law, Singapore 2018, p. 88.

35   Compare J.P. Aires, D. Pinheiro, V. Strube de Lima and F. Meneguzzi, Norm Conflict Identification in Contracts, "Artificial Intelligence and Law" 2017, vol. 25, p. 397ff.

2. Algorithms as an AI Regulation Tool?

The dynamism[36] of AI regulation cannot be correctly dealt with only by traditional legislation published in a natural language. Yet a regulation algorithm may facilitate it. Pursuant to the guidelines included in 'A White Paper on Artificial Intelligence – A European approach to excellence and trust' (COM(2020) 65 final) and also with the AI Act, AI should be characterised by transparency and accountability, and a solid regulatory framework protects EU citizens and helps create the European market for AI.[37] The regulation algorithm may constitute a relevant tool which guarantees transparency, accountability and appropriate dynamism.

The basic feature which distinguishes AI from other algorithms is its possibility to learn by itself in a rational manner.[38] AI systems can be designed to learn to adapt their behaviour by analysing how the environment is affected by their previous actions.[39] Therefore, there are no obstacles to AI learning the imposed rules, orders and prohibitions which are basic paradigms for it, implemented into algorithmic codes[40] which have been earlier prepared by humans.

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36 M. Fenwick, E.P.M. Vermeulen and M. Corrales, Business and Regulatory Responses, *op. cit.*, p. 88.

37 It is worth noting the report of Prof. C.H. Wendehorst prepared for the European Commission: Safety and Liability Related Aspect of Software (June 2021), which points to a broader need for algorithmic regulation, not only in the AI Act; https://digital-strategy.ec.europa.eu/en/library/study-safety-and-liability-related-aspects-software (accessed 20.07.2021). For more about this and the substantive scope of the legislation, see: https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf (accessed 09.04.2021).

38 Definition based on the concept by Marvin Minsky, an AI pioneer, in Perceptrons: M. Minsky, Perceptrons: An Introduction to Computational Geometry, Massachusetts 1969, p. 7ff. See also his: M. Minsky, The Emotion Machine. Commonsense Thinking, Artificial Intelligence, and the Future of the Human Mind, New York/London/Toronto/Sydney 2007, p. 6ff.; M. Yao, M. Jia and A. Zhou, Applied Artificial Intelligence. A Handbook for Business Leaders, Middletown 2018, p. 8; S. Finlay, Artificial Intelligence and Machine Learning for Business, Great Britain 2018, pp. 6–28.

39 Compare other reports: Centre for Information Policy Leadership, Artificial Intelligence and Data Protection: Delivering Sustainable AI Accountability in Practice. First Report: Artificial Intelligence and Data Protection in Tension, 01.11.2018, https://www.informationpolicycentre.com/uploads/5/7/1/0/57104281/cipl_ai_first_report_-_artificial_intelligence_and_data_protection_in_te....pdf (accessed 06.02.2019); Interpol Innovation Centre, Singapore, Innovation Report Artificial Intelligence, https://media.licdn.com/dms/document/C4E1FAQHbu EqCSHEUsQ/feedshare-document-pdf-analyzed/0?e=1549350000&v=beta&t=lpYHjU3SizFf82swBk3g33TLFq WGRy8EjbKyhLPsST0 (accessed 07.04.2021).

40 G. Governatori, F. Idelberger, Z. Milosevic, R. Riveret, G. Sartor and X. Xu, On Legal Contracts, Imperative and Declarative Smart Contracts, and Blockchain Systems, "Artificial Intelligence and Law" 2018, vol. 26, p. 398. The authors name a smart contract as a law-regulating tool. In view of this article, the author refers – in a broader manner – not so much to the very notion of a smart contract as to the algorithm that creates it.

The creation of a correctly operating regulation algorithm, or many such algorithms, requires the identification of functional interactions between different elements, and as they change depending on the context,[41] it becomes necessary to create the environment allowing for the measurement of the system's performance.[42] The development of a regulation algorithm requires the information which enables algorithms to make conscious decisions (prohibitions and orders). The quality of the provided information should be measured by such attributes as whether the information is essential, appropriate, understandable, searchable and well-archived. Such indicators are not easily quantifiable, but they are very significant.[43]

The regulation algorithm may be constructed on the data recorded in the available repositories based – for example – on blockchain,[44] which would ensure the reliability of recording and its unchangeability, and thus transparency and accountability,[45] and in practice, the proof that the data transferred to AI is correct. What is important is that blockchain technology has already become very well known and has been well described, and in relation to which legal regulations have been implemented in many countries, of which the legal presumptions of the truth of the facts is recorded in blockchain. In the eIDADS 2 project, the European Commission proposes to link the legal presumption to the entry of data in a qualified electronic register maintained by a qualified certification service provider[46] (which could be a blockchain). This is not an isolated idea. Individual countries are introducing this type of solution, and the EU proposal is more like trying to catch up. Appropriate adjustments include the proceedings to take evidence concerning the data recorded in blockchain, as well as (for example in Malta, New York state and Singapore) the implementation of regulations concerning the control of codes and systems based on blockchain,[47] which may be easily expanded to cover the control of AI.

Both input and output data should be readable (perceptible) by human beings (in spite of the fact that the algorithmic regulator should be recognisable first of all by AI), which – in compliance with the experts' guidelines – would enable the control of the AI teaching or self-learning process. The repository layer should be composed of codified templates, clauses and libraries which should be accessible by AI through

41   Compare *ibidem*, p. 394ff.
42   The possibility of utilising regulatory sandboxes is indicated by M. Fenwick, E.P.M. Vermeulen and M. Corrales, Business and Regulatory Responses, *op. cit.*, p. 89.
43   T.D. Barton, H. Haapio, S. Passera and J.G. Hazard, Successful Contracts: Integrating Design and Technology, (in:) M. Corrales, M. Fenwick and N. Forgó (eds.), Robotics, *op. cit.*, p. 77ff.
44   K. Werbach, The Blockchain and the New Architecture of Trust, *op. cit.*, pp. 1–7.
45   M. Hildebrandt, Algorithmic Regulation, *op. cit.*, *passim*.
46   eIDAS Regulation, https://digital-strategy.ec.europa.eu/en/policies/eidas-regulation (accessed 15.07.2021).
47   For more, see: D. Szostek, Blockchain and Law, Baden-Baden 2019, p. 5ff. and the literature specified therein.

an interface but – at the same time – possible to be submitted to experts (humans) for their verification or control, also in the form of the text in natural language.[48]

3. Legislator or Private Entity as AI Regulation Algorithm Creator?

Although the concepts for creating a uniform and autonomous law for cyberspace[49] have been suggested for a number of years, their implementation seems to be distant, in spite of the fact that it would significantly facilitate AI regulation. The concept of a separate law for cyberspace is mainly focused on the elimination of the doubts concerning jurisdiction and governing law, as well as the distribution and flow of goods in the digital world.[50] There are different suggestions – from viewing cyberspace as an international space,[51] through cyberspace, as an exterritorial area, being the shared property of all states, to the so-called *lex electronica*.[52] At present, none of these concepts seems to be possible to implement. Therefore, a regulator based on algorithmic code currently seems to be the most viable solution, all the more so because it can operate at different legislation levels, as well as being able to be created both by public and government bodies and by private entities (as a LegalTech). It can also be connected with a specific territory (e.g. the EU, individual states).

Having accepted and taken into account the guidelines of the 'White Paper for AI', software providers will have to create relevant data ecosystems or private regulation algorithms which are subject to ex-post control in case of damage caused by AI.[53] However, a question arises about whether private entities should be the only ones that should create such systems or regulation algorithms. Is it not worthwhile thinking about – when the opportunity arises in connection with AI regulation – the broader implementation of law into algorithmic codes at the level of the European Community and individual Member States? Should the EU legislator limit only the

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48   M. Araszkiewicz, Algorytmizacja, *op. cit.*, p. 55ff.; W. Cyrul, LegalTech, *op. cit.*, p. 88ff.

49   Such a concept is supported by D.R. Johnson and D. Post, Law and Borders: The Rise of Law in Cyberspace, 'Stanford Law Review' 1996, vol. 48, no. 5.

50   J. Kulesza, Międzynarodowe prawo Internetu, Poznań 2010, p. 291.

51   D.C. Menthe, Jurisdiction in Cyberspace: A Theory of International Spaces, 'Michigan Telecommunications and Technology Law Review' 1998, no. 69, pp. 69‑103.

52   P. Trudel, La lex electronica, (in:) C.A. Morand (ed.), Le droit saisi par la mondialisation, Brussels 2001, p. 221; V. Gautrais, Lex Electronica: d'aujourd'hiu a demain, 'Lex Electronica' 2016, http://www.lex-electronica.org/articles/volume-21/lex-electronica-daujourdhui-a-demain/ (accessed 21.07.2019). The issue of *lex electronica* is also discussed by L. Railas in The Rise of the Lex Electronica and the International Sale of Goods, Helsinki 2004, p. 500ff.

53   Attention should be paid to the suggestion included in 'A White Paper for AI' concerning the requirements for said application.

regulations created and published in a natural language, with the use of RegTech[54] tools as a technological support for traditional regulation at the most?

In the author's opinion, the issue of AI regulation is an excellent opportunity to use RegTech in the legislative process of the European Union, and even further, to establish law implemented into algorithm. The introduction of regulation algorithms for AI at the level of the Community, and created by the Community as the obligatory law, will contribute to the development of AI in the EU, and thus to the cybereconomy. It will be an element supporting small and medium-sized enterprises which – unlike big enterprises – cannot afford costly regulation algorithms. It would also decrease expenditure – once created, a regulation algorithm would be used by many enterprises and other entities of the European Union. It will also contribute to the unification of regulation throughout the Community, and thus the reliability of law. Legislation published only in natural language will not provide such benefits. What is important is that it is not necessary to create the entire legal system in codes for AI at once. It could be started with the creation of legislative 'puzzles' referring to individual spheres which are then slowly interconnected, both horizontally (that is, as individual regulation algorithms of different branches of EU law) and vertically (EU law, national law, local law, etc.).

The current discipline of law shows the territorial, personal and temporary scope of the application of legal provisions. AI regulation algorithms under the legal system implemented into codes may take into account those scopes being the same external source of regulation[55] for AI ecosystems. For just as humans have to observe the provisions according to their hierarchy or the territory of their applicability, it is possible to similarly develop an algorithmic regulator taking into account the nature of such provisions. To put it in different words, the AI regulation should be of a cascading nature.

In the author's opinion, the adoption and implementation of an international convention[56] referring to artificial intelligence is required, which would become the grounds for implementing a technologised code-based AI operator and for introducing such restricting codes,[57] and enforcing consideration of the AI regulator

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54 More on the conceptual scope of LegalTech, RegTech and others is in: D. Szostek (ed.), Legal Tech, *op. cit.*, pp. 7–9.

55 It is one of the elements of the divisions of smart contracts. D. Szostek, Blockchain and Law, *op. cit.*, p. 122.

56 Activities concerning the creation of such a convention have been undertaken by the Council of Europe, yet it will take time to achieve results.

57 The discussion of AI regulation refers – quite seriously – to Asimov's Robotics Laws as the elements of such regulation: 1. A robot may not injure a human or, through inaction, allow a human to come to harm; 2. A robot must obey the orders given to it by humans except where such orders would conflict with the First Law; 3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws. The First Law is the answer in the discussion concerning AI and wartime law.

in AI ecosystems. It should be assumed that a convention will be concluded and published in natural language in compliance with the requirements of public international law.

Regardless of the international convention, the European Union is preparing its own EU legislation in natural language, which regulates AI.[58] It is worthwhile thinking about the parallel preparation of the algorithm; depending on the will of the EU, it could take different forms. The optimum solution would be that such an algorithm is the effective law and not only a technological tool supporting the regulation (RegTech). Yet it would require significant changes in the understanding of EU law and legislation. However, it would contribute to the unification of restrictions for AI and the reliability of law in the territory of the EU. The last level should include the national regulation algorithms under the scope of local legislation as a supplement to the EU regulator. This would be a major step into the future and would influence the development of the European digital economy.

Such a process would require the commitment of numerous entities on different levels and with significant outlays, but is possible to implement. However, it requires a different perception of law. A lawyer gains education which enables them to find their way through an impenetrable maze of regulations through many years of work (studies and then legal training). An algorithm would have to be educated in a similar way. Thus the creation of a regulatory system based on algorithms will be very complex, costly and time consuming during the first stage. With time, such a system should become increasingly effective and less costly. It can be started with small sections of law and gradually expanded. The AI regulation is a good opportunity to make such an effort, at the level of both scientific research and implementation. Another solution is to create a single Community RegTech tool (as an integral part of the AI Act) to support AI auditability, especially since, according to the AI Act proposal, there are going to be entities auditing and certifying algorithms at national levels anyway, or as private entities, which will have to create appropriate technological tools (and thus RegTech) to meet the requirements of the proposed act. Instead of multiple, dispersed algorithms, used by a number of different entities, including private ones, when auditing AI, how about a single community tool?

4. Yet It Is Not That Simple

The concept of algorithmic code as an AI regulator presented above may seem futuristic. Yet given the fact that, at present, many activities are concluded and enforced with the use of smart contracts, with complex agreements, and of which some have already been supported by AI or machine learning-based algorithms, may

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58   These include the above-mentioned AI Act.

it be that it is still possible to implement such a concept? The algorithm perfectly regulates private law (agreements and smart contracts), so why should it not be expanded to legislation?[59] However, many questions and doubts arise,[60] and also issues requiring further research.

Firstly, how can the entities utilising AI be obligated to connect their ecosystems to the regulation algorithm? How should such a system be developed? What paradigms should be assumed for AI? Which norms and rules should be taken into account? Only the international ones, or also local, imperative or dispositive ones? How should competition and freedom of economic activity be guaranteed? There are issues such as the assessment of values such as liberalism and freedom in cyberspace, and the regulations restricting them; differences in legal systems and cultural differences; ethical issues and their diversification in different cultures; whether the law of nature, ethics, and moral law should be taken into account;[61] the issue of identification of entities on the Internet;[62] the issue of identification of legal systems applicable to a given act (AI and private international law); whether and to what extent precedents and soft law should be taken into account and weighted; whether soft law such as ISO standards and others should be included; who should control the system, in what ways, and what the consequences of violation should be; how to prevent cyberattacks; who should control code and those who write codes, how, and who should control the controllers; what should happen when a law is violated or codes are changed. Such questions may proliferate.[63]

Conclusion

This article is just a contribution to the discussion, focused not so much on the scope as on the technical manner of artificial intelligence regulation. In the author's opinion, when the opportunity arises in connection with AI regulation, it is worthwhile tackling the new perspective on legislation, as law implemented into code (algorithm) but also enforced by algorithm. It seems that the hypothesis concerning AI regulation through regulation algorithms is justified as to its substance and – significantly – as to practice. However, it requires a change of approach to law

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59   Such scientific attempts are already being made; see: M. Araszkiewicz, Algorytmizacja, *op. cit.*, p. 55.

60   The issue of difficulties with the utilisation of databases in expert systems is dealt with in M. Badiul Islam and G. Governatori, RuleRS: A Rule-Based Architecture for Decision Support Systems, 'Artificial Intelligence and Law' 2018, vol. 26, p. 7.

61   C. Magnusson Sjöberg, Legal Automation, AI and Law Revisited, (in:) M. Corrales, M. Fenwick and H. Haapio, Legal Tech, *op. cit.*, p. 172.

62   L. Lessig, Code and, *op. cit.*, p. 30, 54.

63   An attempt to answer some of these questions may be found in . Turner, Robot Rules, *op. cit.*, p. 133ff.

and the tradition related thereto. We should consider negatively the concept of the exclusivity of an algorithm as the regulator, without the possibility of verification of law in natural language. Both input and output data should be subject to control by a human being in a manner which is at least indirect (the transcription of codes into natural language), which is in compliance with the AI Act. In other words, the regulation algorithm should operate as a hybrid of the code with the possibility of transcription into natural language. In the author's opinion, the regulation algorithm should be the law and not only a LegalTech tool supporting the regulations, created but mainly published as law by relevant authorities of the EU. This vision is bold, yet not impossible. As a final option, it could be a unified community RegTech tool.

We have a chance for the solution to provide an opportunity for the development of the cybereconomy and greater efficiency. It is worthwhile starting discussion in that regard and to continue scientific research. At the moment, talks and research on an AI regulatory algorithm for Polish state systems are already conducted at the national level in the NASK. Similar work is conducted by other EU countries. In order for this work not to be duplicated, it is worth transferring it to the level of the whole EU.

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