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From Outer Space to Algorithms: What Can Administrative Law Learn from International State Responsibility Regimes?

Keywords: administrative law, space law, international responsibility, algorithms

Summary. The ongoing process of digital transformation across all sectors of public life is fundamentally transformative, paralleling the revolutionary nature of the technologies that drive it. The development and deployment of artificial intelligence in public administration pose challenges to administrative law that are structurally analogous to those encountered by international law in relation to state activities in outer space: the absence of complete control, high levels of risk, the involvement of private actors, and the necessity of attributing ultimate responsibility to the state as the “ultimate guarantor”.

The analogy advanced here is necessarily broad, given that the domains in question appear, *prima facie*, to be entirely distinct. Nevertheless, the effort to address questions such as who bears responsibility (and concomitant risk) for decisions made by AI, the legal status of AI and the possibility of conferring legal personality upon it, and the nature of the relationship between the state and private actors with regard to AI, reflects longstanding inquiries within the broader space sector. These inquiries encompass issues of accountability, the interaction between the state and private entities engaged in space activities, and the adequacy of the existing treaty framework governing such activities, including considerations for its potential modification where deficiencies are identified.

Od przestrzeni kosmicznej do algorytmów: jakie inspiracje prawo administracyjne może zaczerpnąć z międzynarodowych reżimów odpowiedzialności państwa?

Słowa kluczowe: odpowiedzialność państwa, odpowiedzialność algorytmu, odpowiedzialność w prawie kosmicznym, due diligence w prawie kosmicznym i administracyjnym

Streszczenie. Proces transformacji cyfrowej, który obecnie zachodzi we wszelkich dziedzinach życia publicznego ma charakter przełomowy, tak, jak przełomowa jest technologia, która tę transformację uruchomiła. Rozwój i wykorzystanie sztucznej inteligencji w administracji publicznej stawia prawo administracyjne przed problemami strukturalnie podobnymi do tych, z którymi prawo międzynarodowe mierzyło się (i nadal się z nimi konfrontuje) w odniesieniu do działalności państw w przestrzeni kosmicznej: brakiem pełnej kontroli, wysokim stopniem ryzyk o różnym charakterze, aktywnością podmiotów prywatnych oraz koniecznością przypisania odpowiedzialności państwu jako „ostatecznemu gwarantowi”. Zasygnalizowana tu, z konieczności luźna, analogia, tylko na pozór dotyczy sfer kompletne odległych i nie mających wspólnej części – w gruncie rzeczy poszukiwanie odpowiedzi

na takie pytania, jak: kto odpowiada (i tym samym, kto ponosi ryzyko) za decyzje podjęte przez AI, jaki jest status AI i czy można przypisać AI osobowość prawną, a także, jaka w perspektywie funkcjonowania AI jest relacja między państwem a podmiotami prywatnymi, odzwierciedla wieloletnie rozważania prowadzone w szeroko rozumianym sektorze kosmicznym. Rozważania te obejmują kwestie odpowiedzialności, interakcji między państwem a prywatnymi podmiotami prowadzącymi działalność w przestrzeni kosmicznej oraz adekwatności istniejących ram traktatowych regulujących tę działalność, w tym możliwości ich modyfikacji w przypadku stwierdzenia nieprawidłowości, do aktualnego stanu wiedzy, rozwoju technologicznego i cywilizacyjnego.

Introduction

The process of digital transformation currently unfolding across all spheres of public life is of a groundbreaking nature, much like the technology that has set it in motion. It affects all economic, social, and welfare systems and constitutes an integral component of the global strategy for sustainable development, as reflected in two key reports prepared in 2018 and 2025 by the research initiative The World in 2050 (TWI2050)¹. In both reports, this process is described as a *digital revolution* and is attributed the role of a leading driving force of societal transformation. According to the authors of these reports, digital technologies are capable – faster than ever before – of supporting decarbonisation and the development of a circular economy, as well as the so-called sharing economy, dematerialisation, efficiency, and resource and energy sufficiency. They may also facilitate the monitoring and protection of ecological and other Earth systems, the safeguarding of global commons, and the promotion of sustainable behaviour. At the same time, these technologies, which also possess destabilising potential, have not yet been fully harnessed for the purposes of societal transformation towards sustainable development and a sustainable future. It appears self-evident that public administration bears the responsibility of taming these technologies² and embedding them in the service of humanity in the era of the Anthropocene³. It may seem trite to observe that the rapid development

¹ *The Digital Revolution and Sustainable Development: Opportunities and Challenges* chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/https://www.idos-research.de/uploads/media/TWI2050-for-web.pdf: https://pure.iiasa.ac.at/id/eprint/15913/ [accessed on: 15.03.2026].

² According to E. Szewczyk: “Contemporary public administration, confronted with an ongoing digital transformation, will constitute one of the driving forces behind the next major development in human history and a key engine of societal progress” (E. Szewczyk, *Algorytmizacja jurysdykcyjnego postępowania administracyjnego i jej skutki społeczne*, Warszawa 2025, *passim*).

³ The Anthropocene is referred to as the geological epoch in which human activity has become the principal force shaping the Earth’s environment, as well as an ethical-legal concept relating to the management of terrestrial, water, and outer space resources. This term—ambiguous and contested—is present in legal discourse, and its use reflects the need for a new approach to human agency in the world, as well as to responsibility for human actions (including in outer space and for climate change), a return to the conception of the Earth as a common good, and the framing of human rights as the legal basis for the protection of the natural environment. See more: D. Mnich; J. Karp, *Prawa człowieka w epoce i filozofii antropocenu*, “Ius Novum” 2025, Vol. 19, Nr 1, pp. 129-145; A special issue

of artificial intelligence has intensified the search for adequate normative solutions, which – according to a well-founded view among some experts – are currently taking shape under conditions of significant regulatory uncertainty, both at the national and international levels⁴. For instance, the European Artificial Intelligence Act (AI Act⁵) has been controversial already at the stage of negotiating its content – from the relatively broad definition of artificial intelligence it adopts, through the complex and analytically demanding classification of AI systems, in particular as high-risk systems entailing additional obligations for entities placing them on the market. As a consequence, the Act has been criticised for imposing excessive regulatory constraints on a dynamically developing technological sector, which may weaken Europe’s competitiveness and lead to its relative slowdown in technological development processes⁶. Moreover, the concepts currently advanced remain fragmentary and reactive in nature and appear to constitute merely a preliminary stage in the development of a comprehensive regulatory framework⁷. A thorough and wide-ranging discussion on future regulations concerning the integration of humans and technology, whose normative articulation may become one of the principal challenges of the second half of the twenty-first century, still lies ahead. The increasingly widespread use of artificial intelligence in public administration gives rise to fundamental questions regarding the liability of the state for actions undertaken with the use of algorithmic systems. This is particularly pertinent in situations where administrative decisions are supported or made using AI-based tools, often designed and operated by private entities, while at the same time the effective control exercised by public authorities remains limited. The aim of the

of the journal “International Relations” 2024, 61/4 edited by M. Basu, the Author of the following considerations: *Reimagining International Relations in the Anthropocene* published in this very issue, was dedicated to the Anthropocene.

⁴ J. Sobczak, *Czy świat algorytmów i sztucznej inteligencji będzie sprawiedliwy? Wykorzystywanie nowoczesnych technologii, algorytmów i modeli predykcyjnych w wymiarze sprawiedliwości*, [in:] *Human Rights Revolution in the Digital Era*, eds. M. Sitek, J.B. Navarro, Józefów 2021, p. 330.

⁵ Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act) and the other Directives: 2014/90/UE, (UE) 2016/797 i (UE) 2020/1828 the texts available here: <https://eur-lex.europa.eu/eli/reg/2024/1689/oj/eng> [accessed on: 15.03.2026].

⁶ M. Ebers, V.R.S. Hoch, F. Rosenkranz, H. Ruschmeier, B. Steinrötter, *The European Commission’s Proposal for an Artificial Intelligence Act—A Critical Assessment by Members of the Robotics and AI Law Society (RAILS)*, available at: <https://www.mdpi.com/2571-8800/4/4/43> [accessed on: 15.03.2026].

⁷ P. Książek, *Prawo cyborgów (1). Wprowadzenie w problematykę*, “Głos Prawa/Przegląd Prawniczy Allerhanda” 2021, t. 4, nr 2 (8), poz. 29. As this author rightfully observes, artificial intelligence like the Internet or social media before it is proving to transform reality extremely quickly and so profoundly that, in effect, entirely new fields of study are emerging. A separate question is to what extent it is possible to ensure a symbiosis between these different spheres amid growing information chaos and the rapid, exponential development of technology.

present study is to propose an analytical comparative perspective that combines administrative law with the *acquis* of public international law⁸, in particular with the regimes governing State responsibility for activities conducted in outer space. In both contexts, States face similar challenges: the constant fluctuation of the operational environment, a high level of risk and the unpredictability of certain consequences, technological complexity, the involvement of non-State actors, and difficulties in attributing specific conduct to public authorities. This study seeks to address the question of whether, and to what extent, solutions developed within public international law – such as the principle of attribution (jurisdiction), the duty of supervision, and the concept of due diligence – may serve as a source of inspiration for shaping administrative-law models of State responsibility for the use of artificial intelligence. The analysis encompasses selected systemic elements of the international legal order relating to outer space that exhibit analogies to the use of modern digital technologies, including artificial intelligence, in the functioning of public administration. For this reason, it is based on the application of the legal-dogmatic and comparative methods. The present considerations do not constitute a classical comparative analysis in the strict sense; rather, they aim to capture analogies of a conceptual nature which – consistent with the well-established methodological view that analogy constitutes an important cognitive tool – may serve as a point of departure for further reflection on contemporary legal challenges. The adoption of such a perspective is justified both by the distinctiveness of the normative orders under examination and by the need to maintain selectivity of argumentation within the constraints of length inherent in a scholarly article.

1. Artificial Intelligence Between Technology and Administrative Regulation

Artificial intelligence (AI) is not merely a technological challenge; from the perspective of the functioning of the State, it constitutes an administrative-law challenge. Designing normative solutions adequate to a reality undergoing rapid digital transformation requires the development of comprehensive conceptual frameworks—structures within which the law can respond systematically and consistently to emerging problems, while at the same time ensuring the protection of individual rights. Meanwhile, as noted by P. Książek, the body of law on artificial intelligence developed thus far is reactive and fragmented, lacking the necessary structure, coherence, and foundational underpinnings⁹.

⁸ Further as PIL.

⁹ *Ibidem*.

State responsibility in the era of the algorithmisation of public administration is thereby reinforced as a key instrument for the protection of individual rights and for legitimising the exercise of public authority under conditions of digital transformation. From this perspective, the legal consequences of the use of artificial intelligence delineate a new “regulatory space,” much as the exploration and use of outer space once led to the emergence of new normative structures. In order to substantiate this analogy as an analytical tool, it is necessary to point to the features common to both domains: the absence of full control, unpredictability and a high level of risk, the activity of diverse private actors and their complex relationships with the State, and the responsibility of the State as a “gatekeeper.” Domains such as space activities and the use of artificial intelligence in public life also constitute regulatory areas characterised by a unique profile of ethical challenges, which must be taken into account in the law-making process. The term “regulatory space” is not a term of legal language and is only rarely used in the doctrine of law, typically in an intuitive manner without being assigned a precise meaning¹⁰. In the context of digital transformation, however, it appears to possess considerable analytical potential, as it does not refer to a territorially bounded domain but rather reflects the necessity of framing, in legal terms, the conduct of actors within a complex and rapidly evolving sphere of public life and environment. This sphere encompasses, inter alia, domestic and international legal regulations, the monitoring and governance of commercial, scientific, and security-related activities, and the attribution of responsibility for such activities. The concept of a “regulatory space” supports the assumption that the resources relevant to the exercise of regulatory authority and competences are dispersed or fragmented. They are not limited to formal legislative power or contractual relations, but also include information, capital, and organisational capacities. Control over these resources is distributed both among State authorities and between public and private actors. Under such conditions, certain entities such as corporations may acquire an informal hegemonic position by concentrating key resources, including organisational capabilities, technological capacity, and accumulated information. This informal position may, in turn, enable them to influence law-making or the application of law as a regulatory instrument.

¹⁰ Relatively considerable attention has been devoted to this term and its meaning in the social sciences by L. Hancher, M. Moran, *Organizing Regulatory Space*, [in:] *Capitalism, Culture and Economic Regulation*, eds. L. Hancher, M. Moran, Clarendon Press 1989, pp. 272-277; and similar considerations can be found in M. Leach, *From Recklessness to Prudence. A Study of Regulatory Space Change in Indonesian Banking from 1997 to 2008*, Trinity 2015, pp. 11-23. In turn, M. Zachara argued already a decade ago that the regulatory space lying beyond the reach and control capacities of governments is expanding, creating a vacuum of authority that is readily filled by private actors (a point that is particularly relevant both in the context of outer space and the use of artificial intelligence in public life), see this Author's *Global governance. Ład międzynarodowy po zakończeniu stulecia Ameryki*, Kraków 2012, pp. 85 and 265.

In reality, therefore, the hierarchical subordination of regulated entities to the regulator is not always maintained within a regulatory space. This space is populated not only by regulated entities, but also by other stakeholders—both public and private—who, to varying degrees, possess relevant resources. The relationships between them are complex, dynamic, horizontal, and based on negotiated interdependence. The aforementioned dispersion of resources among heterogeneous actors within the same regulatory space deprives the regulator of a monopoly over both formal and informal power. In such a context, the negotiation of mutual relationships among active participants becomes a strategy not only for survival but also for effective action, while law-making and law enforcement constitute integral elements of this process¹¹. It appears justified to apply the notion of a (new) “regulatory space” both to outer space and to those aspects of public administration that are based on algorithmic operations, in particular automated decision-making.

Ensuring sustainable development, a central objective and challenge of our time, requires the promotion of innovation across all spheres of life. The use of modern technologies in the functioning of public administration is therefore not only expected by contemporary societies but constitutes a necessity for the modern realisation of the rule of law. As aptly observed by E. Szewczyk, contemporary societies are transitioning from the industrial era (based on the rule of law) to the digital era (based on algorithms)¹², which entails confronting one of the most significant contemporary challenges in this field: the implementation widely discussed in legal doctrine of solutions involving the use of algorithms in the application of law, in particular for the automated issuance of administrative decisions. Referring to the previously outlined concept of a new regulatory space emerging or to be shaped in the context of integrating public administration with algorithmic tools, attention must be paid to the associated legal concerns, social implications, and axiological tensions inherent in these regulatory domains¹³. At the core lies the need to ensure appropriate legal safeguards both for decision-making processes involving algorithms and for State responsibility for their effects, over which full control cannot be exercised. These decision-making domains include social benefits, taxation, migration, and broadly understood security, encompassing personal,

¹¹ C. Scott, *Analysing Regulatory Space: Fragmented Resources and Institutional Design*, “Public Law” 2001, pp. 283–305.

¹² E. Szewczyk, *op. cit.*, p. LII.

¹³ According to E. Szewczyk these concerns primarily revolve around the digital facilitation of totalitarian ambitions, elite domination, the deepening of social inequalities, complete surveillance, and the loss of freedom and social cohesion; the evolution of the artificial human and the blurring of boundaries between humans and machines; and whether, at the next stage of the digital revolution, sentient artificial beings with autonomous decision-making and reproductive capabilities could emerge (*ibidem*, p. 8).

digital, social, health, and financial dimensions. The use of algorithms necessitates compliance with standards applicable to the functioning of public authorities, including the principles of legality, transparency, and proportionality.

This is not a challenge faced solely by the Polish legislator – States are confronting it in various ways. On the one hand, the development of a normative model at the international level appears desirable; on the other hand, as illustrated by the analogy to international space law, there is a growing reluctance among States to assume treaty obligations, particularly in areas undergoing especially rapid and profound transformation.

2. State Responsibility and International Analogies

The question of who bears responsibility when a system fails is equally pertinent both: in the outer space where, due to factors such as environmental conditions, human activity cannot be fully controlled and may give rise to consequences that are unforeseeable even with the exercise of due diligence and in public administration operating with the use of algorithms with special regard of decision – making. *Prima facie*, in both cases, responsibility is attributed to the State.

2.1. State Responsibility in Complex Systems: Doctrinal Evolution from ICJ Jurisprudence to Algorithmic and Space Governance

In public international law, including international space law, it has not been possible to codify, by treaty, rules governing the responsibility of subjects of international law starting with states. There is, however, a functional consensus within the international community as to the constituent elements of such responsibility: states (which remain the most important group of subjects of international law) know which types of conduct give rise to responsibility, understand its consequences, are familiar with its forms of implementation, and accept these rules in practice. As aptly put by R. Sonnenfeld, responsibility constitutes the entirety of legal relations that arise in international law in connection with a breach of international obligations or with damage caused in the course of lawful activities¹⁴. Even though there has so far been no political will to fully codify the issue of responsibility and liability of states and other subjects in public international law, the doctrine of state responsibility is reflected in the jurisprudence of the International Court

¹⁴ R. Sonnenfeld, *Podstawowe zasady odpowiedzialności międzynarodowej państwa*, [in:] *Odpowiedzialność państwa w prawie międzynarodowym*, ed. R. Sonnenfeld, Warszawa 1980, p. 22.

of Justice¹⁵ and finds its expression in the Articles on Responsibility of States for Internationally Wrongful Acts¹⁶.

The concept of state's responsibility in public international law has an allegedly simple, dual structure: a state incurs responsibility where conduct attributable to the state constitutes a breach of an international obligation. This dual requirement forms the core of international responsibility, as evidenced by the structure and normative content of ARSIWA as well as by the reasoning of the International Court of Justice. The ICJ has consistently affirmed that any internationally wrongful act entails responsibility, and that this finding has the status of general principle. Consequently, the Court's role is to determine whether conduct is attributable to the State and whether a breach of an international obligation can be established. According to the ICJ, attribution may be established on two distinct grounds. Attribution is straightforward and essentially automatic in respect of State organs, including armed forces operating extraterritorially, regardless of whether they act *ultra vires*, as reaffirmed by the ICJ in *Armed Activities on the Territory of the Congo*¹⁷. ICJ jurisprudence clearly establishes that a state exercising effective control over foreign territory incurs responsibility not only for its direct conduct, but also for failures to prevent violations within that sphere of control, thereby grounding responsibility in governance rather than in discrete acts. Doing so, ICJ already has moved beyond the classical paradigm of state responsibility (anchored in attributable conduct and breach) toward a broader conception based on omissions, foreseeability, and systemic failures of control.

The above-described approach ensures that the state evade international responsibility by invoking its internal law or the irregular conduct of its organs, since international law attributes such conduct to the State regardless of its conformity with domestic law or its *ultra vires* character. However, once conduct involves non-state actors, the Court adopts a markedly more restrictive stance. In *Military and Paramilitary Activities in and against Nicaragua*¹⁸ the ICJ developed the "effective control" test. Under this standard, conduct of private actors is attributable to a state only if the state exercises control over the specific operations in which the wrongful acts occur while general support, financing, or even coordination is insufficient.

¹⁵ Further as ICJ.

¹⁶ Further as ARSIWA: United Nations Legislative Series, Materials on the Responsibility of States for Internationally Wrongful Acts (ST/LEG/SER B/25, U.N. Sales. No. E.12.V.12). The text has been reproduced in General Assembly resolution No 56/83 of 12 December 2001 and corrected by document A/56/49(vol. I)/Corr.4. See also the commentary and the other materials on ARSIWA in "Yearbook of the International Law Commission" 2001, vol. II (Part Two).

¹⁷ *Armed Activities on the Territory of the Congo (Democratic Republic of the Congo v Uganda, Judgement – Merits)* ICJ Reports 2005, paras 173–180.

¹⁸ *Military and Paramilitary Activities in and against Nicaragua (Nicaragua v United States of America, Judgement – Merits)* ICJ Rep 1986, paras 109–110 and 115.

Attribution is narrowly confined to situations of demonstrable operational control by the state over the conduct of non-state actors¹⁹.

This restrictive attribution-based approach, however, generates an inherent structural tension. Where attribution is difficult to establish in multi-actor and causally opaque environments, there is a significant risk that harmful conduct escapes the scope of international responsibility. Such environments are characterized by fragmented agency, indirect chains of causation, and the diffusion of decision-making across institutional and technological layers, including state organs, delegated entities, and algorithmically mediated systems. The ICJ has responded to this problem in a gradual but doctrinally significant manner through the development of due diligence obligations. Already in the *Corfu Channel Case*²⁰, the Court articulated the principle that a state must not knowingly allow its territory to be used for acts contrary to the rights of other states. This obligation does not depend on strict attribution of wrongful conduct; rather, it imposes responsibility for failures of prevention in situations where harm is foreseeable and within the state's capacity to address. The same normative logic is further developed in the *Bosnian Genocide Case*²¹, where the ICJ distinguished between responsibility for committing genocide and responsibility for failing to prevent it. The latter is governed by a due diligence standard, requiring states to employ all reasonably available means to prevent foreseeable harm within their sphere of influence or control.

It's worth to note that this insight becomes even more salient when one turns to contemporary forms of governance relying on algorithmic systems²². The comparison is instructive not because the classical framework is obsolete, but because its internal tensions become more visible under technological pressure. Algorithmic decision-making in public administration introduces features that strain the traditional framework. Decisions are no longer the product of singular, identifiable acts (or actors) but emerge from data-driven processes that are probabilistic, adaptive, and often opaque.

¹⁹ What the ICJ confirmed in *Bosnian Genocide Case*, where the Court declined to attribute acts of genocide to Serbia despite substantial evidence of political and logistical support: *Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v Serbia and Montenegro, Judgment)* ICJ Reports 2007, paras 398 and 437-376.

²⁰ *Corfu Channel (United Kingdom v Albania, Judgment – Merits)* ICJ Reports 1949.

²¹ *Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v Serbia and Montenegro, Judgment)* ICJ Reports 2007, paras 398 and 430.

²² K. Creutz noted a few years ago that responsibility has become fragmented, and that the traditional bilateral approach to state responsibility also fits poorly with addressing certain modern legal challenges, including climate change or criminal responsibility regimes. According to this author, there is a tendency to broaden the scope of responsible actors beyond the state. See: K. Creutz, *The Tenacity of the Articles on State Responsibility as a General and Residual Framework: An Appraisal*, <https://www.ejiltalk.org/the-tenacity-of-the-articles-on-state-responsibility-as-a-general-and-residual-framework-an-appraisal/> [accessed on: 28.04.2026].

From the perspective of ARSIWA, attribution appears straightforward at first: the system is deployed by a public authority and thus falls within the scope of state organs under Article 4. However, the situation becomes more complex when the system is developed by private entities, trained on external datasets, and operates with a degree of autonomy. Applying the effective control test from the Nicaragua case, it becomes difficult to argue that the state exercises control over various stages and specific outputs generated by the system. The result is a paradox the state clearly governs the system, yet may lack the level of control required for attribution under classical doctrine. Here the ICJ's due diligence jurisprudence becomes relevant. If one transposes the logic of Corfu Channel to the digital domain, the state's obligation is not limited to refraining from wrongful acts but extends to ensuring that systems under its jurisdiction do not produce harmful effects. The relevant question shifts from whether the state controlled a particular output to whether it took all reasonable steps to prevent foreseeable harm. In the context of algorithmic governance, such steps would include testing for bias, ensuring data quality, implementing human oversight, and establishing mechanisms for redress. Responsibility thus arises not from the act itself, but from the failure to adequately govern the conditions under which the act emerges. It's illustrated and developed in the following legal acts: the EU AI Act²³ and the OECD AI Principles²⁴. These instruments adopt a fundamentally different approach to responsibility – instead of focusing on attribution of conduct and violation of obligation, they focus on risk management, continuous monitoring, and *ex ante* safeguards. Responsibility is distributed across multiple subjects: developers, deployers, operators, and is embedded in the lifecycle of the system. The objective is not merely to assign liability after harm occurs, but to prevent harm through structured oversight. The PIL's concept of responsibility shaped by ARSIWA and the ICJ's normative logic is retrospective and event-based, while algorithmic governance has to be prospective and process-oriented. PIL seeks to establish a causal link between conduct and harm, AI regulation has to accept uncertainty and operates on the basis of probabilistic risk. ARSIWA presupposes control as the basis of responsibility, algorithmic governance replaces control with accountability for managing systems that generate risk. In this case, the due diligence obligations already presented in the ICJ's jurisprudence may evolve into the primary mechanism for engaging responsibility. The states would be held responsible not because they caused harm in a direct sense, but because they failed to adequately regulate the systems through which harm materialized.

²³ Regulation (EU) 2024/1689 of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) [2024] OJ L, 12.7.2024.

²⁴ <https://www.oecd.org/en/topics/ai-principles.html> [accessed on: 27.04.2026].

The question of responsibility is no longer simply about who acted, but about who designed, deployed, and failed to control the systems through which action occurs.

The other important elements of the classical framework of state responsibility remain resistant to adaptation. The law of reparation, anchored in the *Factory at Chorzów*²⁵ as the principle of full reparation, presupposes that harm can be identified, quantified, and even reversed. In the context of algorithmic systems, harm is often diffuse, collective, and ongoing. Compensation, as illustrated in *DRC v Uganda Reparations*²⁶, remains the dominant remedy in PIL, but it may be ill-suited to address systemic discrimination or loss of trust in public institutions.

From the provisions of international space law, including the two treaties forming its normative core: the Outer Space Treaty adopted in Moscow, London and Washington on the 27th of January 1967 (in particular Articles VI and VII)²⁷ and the Convention on International Liability for Damage Caused by Space Objects adopted in Moscow, London and Washington the 29th of November 1971 (with particular emphasis on Articles II, IV, V and VI)²⁸ it follows that a state bears responsibility for the acts of its own organs as well as private entities, even where it does not exercise full control over their activities. Under these provisions, in the event of damage caused beyond the surface of the Earth to a space object of one state by a space object of another launching state, the responsibility of the latter arises if the damage is due to its fault or the fault of persons for whom it is responsible. This reflects the essence of attributing responsibility to the state under international law for activities carried out in outer space. Such responsibility stems not from direct authorship, but from the role the state has assumed in this sphere. On the one hand, in outer space and more broadly beyond the limits of national jurisdiction, there is no equivalent of what domestic law would describe as a sovereign: there is no overarching legislative, executive, or enforcement authority empowered to regulate the conduct of, *inter alia*, private actors. Consequently, it is not feasible to attribute responsibility directly to a company at the international level or to enforce it within the decentralized system of the international legal order. On the other hand, at the time when the foundations of international space law were being established, the private space sector was virtually non-existent, and the only entity whose responsibility could be defined and enforced was (and,

²⁵ *Factory at Chorzów (Germany v Poland, Judgment – Merits)* PCIJ Series A No 17, 1928 (Sept. 13).

²⁶ *Armed Activities on the Territory of the Congo (Democratic Republic of the Congo v Uganda – Reparations)* ICJ Reports 2022, para 108.

²⁷ UNTC 610/1967, No 8843, the text available also at: <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/outerspacetreaty.html> [accessed on: 25.02.2026].

²⁸ UNTS 961/1983, No. 13810 the text available also at: <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/liability-convention.html> [accessed on: 25.02.2026].

in this sphere, continues to be) the state. The international community has thus developed, in a sense, a substitute mechanism of responsibility based on risk rather than solely on fault, placing the state conceived as the guardian of access to outer space, at its centre. The burden of identifying the actual perpetrator of the damage and of ensuring effective reparation (in particular through the payment of compensation) is shifted to the level of internal relations between the state and the entity conducting the relevant activities. From the perspective of international law, such internal settlements, including any possible recourse mechanisms, are irrelevant, since responsibility vis-à-vis external actors is consistently attributed to the state. A state may delegate technologically complex activities, but it remains under a duty of due diligence²⁹, retains and must exercise supervision, bears responsibility, and must ensure the safety of those activities.

Finally, this structure of responsibility also stimulates the state: it not only prevents states from evading responsibility by shifting it onto private companies and from creating gaps in accountability, but also compels them to develop domestic legislation³⁰ and control mechanisms (such as registries, licensing systems, and supervisory frameworks). Space law is therefore, *inter alia*, a system for governing high-risk technologies, not merely a regime of classical liability for wrongful acts, and outer space is not only a domain of promising opportunities but also a common good of all humankind where any damage may have global consequences. Adopting a broad scope of responsibility is thus a more adequate solution than leaving it indeterminate, as it prevents situations in which no responsible subject can be identified.

²⁹ K. Szpyt, A. Bilski, *Wybrane wyzwania prawne i organizacyjne związane z wdrażaniem systemów AI w działalności samorządów terytorialnych*, "Prawo i Więź" 2025, nr 1(54), *passim*.

³⁰ It is, however, difficult not to note that this pressure does not always translate into practice—the Polish Act on Space Activity, for instance, only reached its final form in February of this year and was forwarded in March for the signature of the President of the Republic of Poland: <https://www.sejm.gov.pl/Sejm10.nsf/PrzebiegProc.xsp?nr=2078> [accessed on: 13.03.2026] however, legislative working on it spanned over a dozen years, and its reception among space law experts has not been enthusiastic, as evidenced, for example, by the ambiguous opinion of the Legislative Council dated 13 June 2025, available at: https://www.gov.pl/web/radalegislacyjna/opinia-z-13-czerwca-2025-r-o-rzadowym-projekcie-ustawy-o-dzialalnosci-kosmicznej?utm_source=chatgpt.com [accessed on: 13.03.2026]. For instance, see some critical reflections: K. Malinowska, *O polskim prawie kosmicznym i jego pożądanym kształcie*, "Ad Astra" 2022, nr 4; also Sz. Siuda, *Reglamentacja działalności kosmicznej w Polsce: zakres podmiotowy obowiązku uzyskania zezwolenia w świetle projektu ustawy z 12 maja 2025 r.*, "Studia Prawa Publicznego" 2025, nr 4(52).

2.2. State Responsibility for Its Own Conduct (and That of Other Entities) in the Use of Digital Technologies and AI

The use of artificial intelligence systems in public administration is inherently associated with a fragmentation of causation³¹, whereby the decision-making process is dispersed across multiple actors (the model developer, the technology provider, the implementing entity, and the administrative authority itself) and across successive technological stages. Public institutions operate under increasing pressure, both financial and stemming from citizens' expectations regarding the quality and accessibility of digital services, as well as demands to implement solutions that simplify and accelerate administrative procedures. Under such conditions, identifying a single author of an administrative decision (a civil servant, the administrative authority, or an autonomous system itself) becomes difficult and, at times, even illusory. This gives rise to the risk of an accountability gap, consisting in the inability to attribute responsibility to a specific entity. The legal system, however, does not tolerate such gaps and does not accept situations in which the exercise of public authority falls outside a regime of responsibility. For this reason, it is necessary to designate an entity serving as the ultimate bearer of responsibility (analogous to the substitute liability mechanism developed in space law and referred to above, under which responsibility is borne exclusively by the State), while at the same time ensuring transparency and the protection of individual rights in decision-making processes involving AI. Responsibility thus naturally falls upon the public administrative authority as the entity vested, in the first instance, with democratic legitimacy and decision-making competences. This responsibility does not stem from direct authorship of the act, but rather from the role assumed by the administration in this sphere as organiser and user of AI systems, and therefore has a functional character.

2.3. Due Diligence and Standards of Integrity in Public Administration

In the analysed context, particular importance attaches to the concept of due diligence, which must be understood as an obligation on the part of public administrative authorities to undertake all reasonably required measures to prevent

³¹ On the inadequacy of classical models of liability and the diffusion of responsibility in the use of AI patrz *Prawo sztucznej inteligencji*, eds. L. Luigi, M. Świerczyński, Warszawa 2020. Also see M. Świerczyński, *Sztuczna inteligencja a odpowiedzialność cywilna – uwagi na tle prawa UE*, M. Świerczyński, *Odpowiedzialność cywilna za szkodę wyrządzoną przez sztuczną inteligencję*, [in:] *Prawo sztucznej inteligencji*, s. 57-80 as well as M. Świerczyński, Z. Więckowski, *Sztuczna inteligencja w prawie międzynarodowym. Rekomendacje wybranych rozwiązań*, Warszawa 2021 and those Author's: *Liability for damages caused by artificial intelligence systems – main challenges to be addressed by the European Union conflict-of-laws regulations*, "Prawo w Działaniu" 2023, nr 54, pp. 200-2016.

violations of law and to minimise risks associated with the use of artificial intelligence systems. The notions of “due diligence” (*due diligence*) and “integrity” (*diligentia*), while not identical, are closely related. Due diligence focuses on the process of action undertaken by a public authority or entity and signifies that all reasonably required steps are taken to prevent harm or legal violations. It has an objective character, as it involves assessing whether the authority acted as could be expected of a competent entity in comparable circumstances. In administrative practice, this includes, *inter alia*, the preparation of decisions, procedural oversight, supervision of systems (including algorithmic systems), and risk assessment. Integrity, by contrast, relates more to the attitude of the actor, encompassing diligence, honesty, and compliance with the principles of professional ethics. It has a qualitative and subjective dimension, referring to the motivations of the authority and its commitment to the proper conduct of procedures. In this sense, due diligence may be regarded as a formalised dimension of integrity, combining the obligation of proper and rational conduct with the ethical and professional posture of public administration. In conditions of increasing autonomy of algorithmic systems, due diligence is not limited to the decision-making act itself, but extends to the entire lifecycle of the system from its selection and deployment to ongoing supervision and control of its operation. The concept of due diligence enables a functional linkage between the responsibility of public administration and the use of artificial intelligence systems, serving as a mechanism that compensates for the fragmentation of agency inherent in algorithmic processes. The analogy to international space law is not incidental once again, a similar legal mechanism operates across two distinct normative systems.

In administrative law doctrine, it is emphasised that public authorities are obliged to act with due diligence and integrity, which includes proper supervision and control over decision-making processes irrespective of the tools employed. In the context of the use of artificial intelligence in public administration, due diligence functions as a formalised expression of administrative integrity, encompassing both the obligation to undertake all reasonably required actions to ensure the correctness of decision-making processes and the systematic supervision, auditing, and control of algorithmic tools, while maintaining transparency and fairness in accordance with standards of administrative professionalism. Due diligence thus serves as an instrument of technological risk management, enabling the attribution of responsibility even in situations where direct agency remains dispersed. The adoption of such an approach contributes to ensuring effective protection of individual rights and transparency in administrative action. At the same time, it fulfils a preventive function, incentivising authorities to implement mechanisms of supervision, control, and auditing of algorithms. Consequently, the responsibility

of public administration for the use of AI constitutes – and must constitute – an instrument stabilising the legal system under conditions of increasing technological complexity and volatility³².

Conclusions

The current digital transformation in public administration may be likened to a proton storm: just as charged particles penetrate the atmosphere and produce unpredictable effects, so to do digital technologies and AI systems, as they become embedded in the structures of administration and public life, accelerate its dynamics, introducing impulses and changes that necessitate new regulations, supervisory mechanisms, and the readaptation of existing law.

The experience of public international law concerning State responsibility for space activities may serve as a source of inspiration for administrative law, particularly in the context of the use of artificial intelligence systems. By analogy to the mandatory supervision mechanisms and the exclusive responsibility of the State in outer space, public administration should adopt an approach grounded in due diligence³³, encompassing both the organisation and control of decision-making processes and the systematic oversight of algorithmic tools. This concept makes it possible to attribute functional responsibility even in situations where technical agency is dispersed, while at the same time ensuring the protection of individual rights and the preservation of standards of administrative integrity.

As a result, the use of AI in public administration need not lead to an erosion of responsibility; rather, it calls for its adaptation to technological complexity, indicating directions for the further development of domestic legal frameworks and supervisory procedures. In space law, State responsibility constitutes a systemic necessity: broadly conceived, it compensates for the absence of a sovereign. In the sphere of digital technologies and AI in public administration, it performs a sta-

³² See more: *Administracja publiczna i prawo administracyjne wobec współczesnych ryzyk*, eds. K. Kurczewska, K. Kurzępa-Dedo, Rzeszów–Szczecin 2018.

³³ See E. Chmura-Szczecińska, *Automatyzacja decyzji w prawie – pola i granice stosowania*, “Studia Prawnicze” 2021, nr 2(224), pp. 135-159; J. Sługocki, *Rzetelność jako konstytucyjny wymóg jakości działania administracji publicznej*, “Przegląd Prawa Konstytucyjnego” 2023, nr 3(73), pp. 11-23. As M. Kupiec aptly points out, the authority’s implementation of the principle of conducting proceedings in a manner that builds trust in public administration does not preclude [...] the use of standardized, publicly available templates of justifications in the case of routine, mass-issued decisions based on results generated by artificial intelligence systems. However, it is a condition that officials must be able to individualize such templates with regard to facts and legal grounds that deviate from the standard justification appropriate for a given type of administrative case. [...], this Author’s: *Uzasadnienie decyzji administracyjnej wydanej za pomocą systemu sztucznej inteligencji w świetle realizacji zasady budowania zaufania do władzy publicznej*, “Dyskurs Prawniczy i Administracyjny” 2025, nr 1, pp. 137-147.

bilising function for legal certainty under conditions of fragmented agency and represents a regulatory choice; in this sense, it also serves as an effective instrument of risk management, incentivising administrative authorities to ensure an adequate level of oversight over the technologies they employ.

At the same time, both in space law and in public administration utilising AI systems, specific legal challenges arise in attributing responsibility for decisions taken within multi-stage processes involving both public and private actors, and which are not fully subject to human control. In space law, this problem manifests itself in the need to ensure that the State effectively supervises the activities of space operators and is able to assume liability for potential damage vis-à-vis third parties, even where it does not directly control every action. In AI-enabled administration, by contrast, the challenge lies in defining standards of due diligence in the design, deployment, and ongoing monitoring of algorithmic systems, so that decisions remain lawful, protect individual rights, and are transparent.

In both cases, it becomes essential to develop mechanisms that combine the functional responsibility of public authorities with effective oversight of technological and procedural tools, rather than relying solely on general frameworks of liability.

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