DEMOCRATIC GOVERNANCE

Volume 19, No. 1

Established in 2008
2 issues per year

Lviv
2026

e-ISSN 2070-4038

DOI: 10.56318/dg/1.2026

Founder:
Lviv Polytechnic National University

Recommended for printing and distribution
via the Internet by the Academic Council
of Lviv Polytechnic National University
(Minutes No. 9 of May 28, 2026)

The scientific journal is included in category "B" of the List of scientific specialised publications of Ukraine, in which can be published the results of dissertations for obtaining the scientific degrees of doctor and candidate of sciences in speciality 0413 – Management and administration (Order of the Ministry of Education and Science of Ukraine No. 928, dated June 11, 2026)

Cluster: Economic transformations, business and administration

The journal is presented international scientometric databases, repositories and scientific systems: Google Scholar, Polska Bibliografia Naukowa, Vernadsky National Library of Ukraine, German Union Catalogue of Serials (ZDB), Leipzig University Library, University of Oslo Library, OUCI (Open Ukrainian Citation Index), Worldcat, Litmaps, Ulrichsweb Global Serials Directory, EBSCO, ERIH PLUS, Index Copernicus, J-Gate

Address for contacts:
Lviv Polytechnic National University
79013, 12 Stepan Bandera Str., Lviv, Ukraine
E-mail: lpnu@d-governance.com.ua
https://d-governance.com.ua/

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DEMOCRATIC GOVERNANCE
Vol. 19, No. 1, 2026, 5-19
Journal homepage: https://d-governance.com.ua/
Received: 03.02.2026; Revised: 01.05.2026; Accepted: 28.05.2026; Published: 25.06.2026

UDC 351:004.8
DOI: 10.56318/dg/1.2026.05

E-ISSN 2070-4038

The political dimension of administrative decision-making under automation: Structural shifts in public administration

Mykhailo Yanyshivskyi*
PhD in Public Management and Administration, Assistant
Lviv Polytechnic National University
79013, 12 Stepan Bandera Str., Lviv, Ukraine
https://orcid.org/0000-0002-8788-6339

Abstract. The article aimed to explain how automation structurally transforms the political dimension of administrative decision-making in public administration. Rather than treating automation as a purely technical or organisational innovation, the study conceptualised it as a governance practice that reallocates judgment, responsibility, and legitimacy within administrative systems. Drawing on contemporary theories of bureaucracy and algorithmic governance, the article argued that automation does not eliminate political choice but displaces it from the moment of individual decision-making to the design of procedures, models, and infrastructures that predefine possible outcomes. To capture this transformation analytically, the article introduced the concept of "points of shift" through which automation reshapes political decision-making. Four such shifts are identified: the shift of legitimacy from public justification to technical authority; the shift of responsibility from individual judgment to system architecture; the transformation of political conflict into technical critique; and the increasing invisibility of political choice through its infrastructural embedding. Particular attention is paid to why artificial intelligence intensifies these shifts. Unlike rule-based automation, AI combines data-driven knowledge production, prediction, and semi-autonomous execution, resulting in adaptive and scalable forms of governance in which normative assumptions are embedded in models rather than articulated through political processes. The article concluded that automation – especially when based on AI – does not depoliticise public administration but produces a new mode of political ordering that is less visible, less localised, and more resistant to democratic scrutiny. These findings of the article have practical relevance for policymakers, regulators, and public administrators by highlighting how political choices are embedded in system design and infrastructural arrangements, thereby informing more reflective approaches to the regulation and oversight of automated decision-making

Keywords: artificial intelligence; political dimension of governance; algorithmic governance; responsibility; legitimacy; politicality; procedural rationality

Introduction

Automation has become one of the defining trends in the transformation of public administration in the twenty-first century. Recent research increasingly treats automation not merely as a technological upgrade, but as a reconfiguration of governance practices that reshapes how administrative decisions are produced, justified, and contested. P.R.B. Fortes *et al.* (2022) showed that contemporary policy and expert discourse frames automation primarily through promises of efficiency, predictability, and neutrality, presenting automated systems as capable of minimising human error and ensuring uniform rule application. At the same time, this framing situated automation as a central mechanism through which administrative authority is reorganised rather than simply optimised.

While automation is often portrayed as a means of neutralising discretion, contemporary public administration scholarship demonstrates that decision-making under automated conditions does not eliminate judgment but redistributes it across organisational and technical layers. P. Cantarelli *et al.* (2023) emphasised that even data-intensive governance relies on interpretative processes, as information does not translate directly into determinate

Suggested Citation:
Yanyshivskyi, M. (2026). The political dimension of administrative decision-making under automation: Structural shifts in public administration. *Democratic Governance*, 19(1), 5-19. doi: 10.56318/dg/1.2026.05.

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**Corresponding author (mykhailo.m.yanyshivskyi@lpnu.ua)*

choices. Similarly, L. Diver (2021) conceptualised automated decisions not as discrete acts of will, but as outcomes emerging from procedural architectures, models, and predictive systems, challenging classical understandings of decision-making as a momentary exercise of choice. At the same time, this very claim to neutrality makes automation conceptually problematic from the perspective of the political nature of administrative decision-making. Recent political and administrative theory increasingly conceptualises automation as a transformation of political ordering rather than a process of depoliticisation. A. Öjehag-Pettersson *et al.* (2024) argued that automation reorganises the political dimension of governance by altering the visibility, locus, and contestability of decision-making power. In this view, political choice does not disappear but becomes embedded within system design, standards, and infrastructures, making it less perceptible as an explicit act of decision.

This transformation has significant implications for legitimacy and authority in public administration. U.B.U. Roehl & M.B. Hansen (2024) demonstrated that automated administrative decision-making increasingly derives legitimacy from procedural compliance, standards, and auditability rather than from public justification or identifiable decision-makers. A. Oraldi (2023) similarly showed how contemporary technocratic governance reframes political and ethical questions as matters of technical adequacy, reinforcing a shift from deliberative justification to system-based validation. The political consequences of automation become particularly visible in the domains of conflict and responsibility. Empirical studies by A. Kaun *et al.* (2024) revealed that while citizens often experience automated decisions as opaque and unfair, these negative perceptions rarely translate into articulated political claims, remaining instead at the level of individualised dissatisfaction. S. Maalsen (2023) explained this gap by pointing to epistemic exclusions embedded in algorithmic systems, where lived experience and situated knowledge cannot be translated into data-readable forms. From this perspective, conflict is not eliminated but rendered politically inexpressible. Finally, contemporary governance frameworks increasingly respond to these challenges through managerial and procedural solutions. M. Esposito & T. Tse (2024) showed that AI governance regimes emphasise safeguards, risk management, and compliance architectures, treating legitimacy as a function of system design rather than political contestation.

Against this background, the aim of the article was to provide a conceptual analysis of how automation transforms the political dimension of administrative decision-making in public administration. In line with this aim, the article pursued three interrelated analytical objectives. First, it sought to conceptually decouple the political dimension of administrative decision-making from the institutional status of actors and the formal presence of discretion, treating politicality as a structural property of decisions and showing that politicality persists even under conditions of high formalisation and automation. Second, it reconstructed automation in public administration as a continuum of governance practices based on the delegation of decision-making to formalised systems, rather than as a phenomenon limited to the introduction of artificial intelligence. Third, it identified key structural shifts through which automation transforms the political dimension of administrative decision-making, including shifts in legitimacy, responsibility, the form of conflict, and the visibility of political choice and clarifies how algorithmic and AI-based systems tend to intensify these shifts by embedding political choices within infrastructural and procedural arrangements.

The article was theoretical and analytical in nature and did not aim to provide an empirical evaluation of specific automated systems. Instead, it advanced a conceptual framework that explains why automated administrative decisions remain political even when they are presented as technically necessary or procedurally neutral. In this sense, the study contributed to public administration theory by complementing existing debates on automation with an analysis of its political effects, which cannot be reduced either to questions of efficiency or to issues of technical design.

Materials and Methods

The study was conducted within a qualitative theoretical and analytical framework oriented toward the conceptual reconstruction of the political dimension of automated administrative decision-making in public administration. Rather than examining the performance or outcomes of specific technological systems, the analysis focused on identifying structural transformations through which automation reshaped the organisation of administrative decision-making and the articulation of its political dimension. Accordingly, the study was analytical in character and did not rely on empirical measurement or instrumental evaluation of automated systems.

The scholarly literature used in the study was identified through targeted searches conducted in major academic databases, including Scopus, Web of Science, and Google Scholar. The search process relied on combinations of keywords such as “automated decision-making”, “algorithmic governance”, “administrative decision-making”, “political dimension”, and “public administration”. Rather than applying a strict chronological threshold, the literature selection prioritised recent publications (2020-2025) addressing contemporary forms of automated and algorithmic governance, while selectively incorporating earlier foundational works where they provided indispensable theoretical reference points. Selection criteria emphasised thematic relevance to the transformation of administrative decision-making under conditions of automation, particularly with regard to authority, judgment, legitimacy, responsibility, and political contestation. Studies addressing automation exclusively from a technical, engineering, or implementation-oriented perspective were excluded unless they contributed directly to the analysis of governance logics.

The material base of the analysis comprised three analytically distinct groups of sources. The first group included contemporary research on automated decision-making, algorithmic regulation, and data-driven governance, which was used to identify and systematise structural transformations in legitimacy, responsibility, the form of conflict, and the visibility of political choice. The second group consisted of classical and critical works in political theory and public administration, which served as conceptual anchors for defining the political dimension of administrative decision-making and for distinguishing it from purely technical or managerial rationalities. In addition, empirically oriented case studies of automated systems in areas such as social policy and labour markets were used as illustrative material. These cases were not treated as objects of comparative or evaluative analysis but were employed to assess the coherence of the conceptual framework with observed practices of automated governance and to clarify how structural transformations manifest in concrete administrative settings.

Methodologically, the analysis relied on a combination of conceptual analysis and analytical reconstruction. Conceptual analysis was used to clarify and distinguish key concepts, including the political dimension of administrative decision-making, judgment, automation, and automated decision-making, and to differentiate these categories from adjacent notions such as digitalisation and decision-support systems. Analytical reconstruction was applied to trace how changes in the organisation of administrative decision-making – particularly the transition from street-level to system-level bureaucracy – affected the localisation of choice, responsibility, and the possibilities for political contestation. A structural approach to the analysis of automation played a central role in the methodology. Rather than focusing on the intentions of individual actors or on the technical characteristics of specific systems, automation was examined as a governance regime that transformed the conditions under which power was exercised. This approach made it possible to analyse automated administrative decisions independently of their level of technological complexity – from formalised rules and procedures to AI-based systems – by concentrating on how the localisation of judgment and political choice shifted within these regimes.

The analytical process was carried out in several stages. First, a theoretical framework of the political nature of administrative decision-making was developed, enabling the political dimension to be separated from the institutional status of actors and the formal presence of discretion. Second, automation was conceptualised as a continuum of governance practices based on the delegation of decision-making to formalised systems. In the final stage, a synthesis of theoretical sources was used to identify key structural shifts through which automation reorganised the political dimension of public administration, including shifts in legitimacy, responsibility, the form of conflict, and the visibility of political choice. The limitations of the study are related to its conceptual character. The study did not claim to provide an exhaustive empirical analysis of specific automated systems, nor did it seek to propose normative models of regulation. Its findings should therefore be understood as an analytical framework suitable for further empirical and normative research on automated administrative decision-making and algorithmic governance.

Results and Discussion

The political nature of administrative decisions

In this study, the political nature of administrative decisions is not reduced to party competition, electoral processes, or ideological rivalry. The analytical starting point is the distinction between politics and the political proposed by C. Mouffe (2005), where the political is understood as a dimension of antagonism and exclusion that is constitutive of any social order. In this sense, politicality emerges not at the level of actors' intentions, but at the level of the structure of decisions – where choices are made between alternatives that lack a final rational resolution and cannot be reduced to purely technical optimisation. The distinction between politics and the political makes it possible to separate the institutional surface of governance from its deeper conflictual logic. Politics refers to the set of practices and institutions through which a particular order is established and maintained, whereas the political denotes the permanent condition of that order – value conflict and the inevitable exclusion of alternatives (Mouffe, 2005). For this reason, administrative decisions cannot be reduced to neutral acts of optimisation: every decision that stabilises a specific configuration of power simultaneously renders other possibilities unthinkable and thereby acquires a political dimension. The genealogical background of this position can be found in Carl Schmitt's understanding of the political as a specific type of distinction defined by the logic of collectively significant friend-enemy differentiation (Schmitt, 2007). In Mouffe's reinterpretation, this logic loses its normative radicalism but retains its key analytical effect: the political nature of administrative decisions can be identified independently of actors' intentions, since what matters is not who makes the decision, but which order it temporarily stabilises and which alternatives it excludes.

In public administration, decisions should therefore be understood not as technical operations or mechanical applications of rules, but as the central acts of administrative activity. In the classical line associated with H.A. Simon, as reconstructed in contemporary public administration theory by M. Mintrom (2016), it is the process of decision-making – rather than formal structures or procedures – that constitutes the core of administration. An administrative decision, in this sense, is always an act of choice: it affirms one possible course of action while excluding others and thus produces distributive effects, even in the absence of explicit political motivation. As M. Mintrom emphasises, rules merely structure the field of choice but do not eliminate choice itself or the need to evaluate alternatives and consequences. The existence of formalised standards does

not remove choice, since their application inevitably requires interpretation, the identification of relevant criteria, and the setting of thresholds of acceptability. Under conditions of bounded rationality, decisions are not the result of an exhaustive comparison of all alternatives, but are formed through the progressive narrowing of the space of possibilities, a substantial part of which remains structurally invisible to the organisation (Mintrom, 2016). Empirical studies of administrative decision-making further confirm that between information and decision there is always an interpretive layer shaped by cognitive mechanisms and contextual factors: even within evidence-based governance, the use of data does not automatically lead to a single determinate choice, but is affected by cognitive biases and decision noise (Cantarelli *et al.*, 2023). For this reason, the administrative decision constitutes a privileged point of entry for the political – a site where value conflict takes on a concrete administrative form, even when the decision is presented as procedurally neutral.

The political dimension of an administrative decision is thus expressed not in rhetoric or subjective intentions, but in the structural effects of choice itself. A decision becomes political when it distributes opportunities and risks, establishes hierarchies, defines the boundaries of the acceptable and the unacceptable, and stabilises a particular configuration of normality. The formalisation of such decisions transforms the mode in which political conflict is expressed, translating value-laden choices into the language of procedures, criteria, and thresholds. In this study, explicitly political decisions are not the direct object of analysis, but serve as an analytical point of reference for distinguishing between different types of decisions in public governance. In classical political theory, political decisions are recognised as an institutionally defined category of decisions associated with political offices and democratic mandates. Thus, M. Weber (1946) drew a fundamental distinction between political activity and administrative management, emphasising that the requirement of neutrality (*sine ira et studio*) applies to civil servants, whereas political actors are obliged to act in a value-oriented and conflictual manner and to assume personal responsibility for the consequences of their decisions. Similarly, in contemporary legal doctrine, political offices are defined as positions that entail open value choice and are linked to political rather than disciplinary or legal responsibility (Tkachenko, 2016; Balamush & Dobrovolska, 2021). For this reason, political decisions do not constitute an analytical problem for the study of politicality as such: their political nature is institutionally recognised and openly contestable. Analytical difficulty arises elsewhere – where decisions with comparable value-laden consequences are made outside political status but are presented as neutral administrative or technical acts.

In public administration research, the political nature of decisions is traditionally associated with the concept of discretion, understood as the institutionally permitted space of choice available to officials in the implementation of policy. The classical concept of street-level bureaucracy demonstrates that discretion is a structural condition of policy implementation under constraints of limited resources, time pressure, and uncertain goals (Camillo, 2017). However, discretion alone does not explain where politicality is located: even when discretion is formally narrowed or eliminated, choice does not disappear, but is realised through standards, checklists, and automated calculations that shift power from the level of execution to the system level of rule and criteria design. It is precisely here that the distinction between discretion and judgment becomes necessary. While discretion refers to an institutionally permitted space of choice, judgment, in the sense developed by H. Arendt, is an autonomous act of practical weighing and responsibility that cannot be reduced to the application of an existing rule and may operate even in the absence of formal choice (Burdon, 2015). Judgment is a precondition of responsibility and the point at which a decision acquires political meaning, since it is through judgment that relevant principles, criteria, and thresholds of admissibility are determined. In this sense, the political nature of administrative decisions is linked not so much to the presence of discretion as to the localisation of judgment – in the design of rules, standards, and systems that formally appear neutral but in fact entrench value choices.

The claim to neutrality in such systems does not eliminate politicality, but transforms the mode of its legitimation. In M. Weber's classical understanding of rationalisation, the demand for impartiality applies to administrative execution but does not imply the disappearance of value choice as such. In J. Habermas's critical theory (Oraldi, 2023), this shift is described as a technocratic reduction of practical and ethical-political questions to technical ones, where efficiency becomes the sole criterion of decision adequacy. In this logic, the technical language of procedures, standards, and metrics performs a legitimating function: political decisions are justified not through public weighing of values, but through appeals to science, technology, or the "internal logic" of systems, creating an illusion of apolitical governance. As a result, value choice does not disappear but is relocated into the design of procedures and criteria, making the political less visible in the language of administration while remaining no less decisive for the structure and consequences of decisions.

Points of shift:
Where automation transforms the political

If an administrative decision is understood as an act of choice in which judgment is localised and the political dimension of governance is manifested, the next analytical step is to examine what happens to this choice in the process of automation. Building on the established understanding of administrative decision-making as a structured act of choice, the next analytical step is to examine how this choice is reconfigured under conditions of automation. Within this continuum, contemporary algorithmic and AI-based systems do not constitute a qualitatively different phenomenon, but rather represent a radicalisation

of a long-standing administrative logic of delegating decision-making to formalised systems. In public administration, automation should therefore be understood not as a technical innovation or a subtype of digitalisation, but as an administrative practice of delegating the function of decision-making or decision execution to formalised systems. Within the classical tradition of street-level bureaucracy, such instruments are interpreted as organisational responses to structural constraints of administrative activity – resource scarcity, time pressure, and goal ambiguity (Camillo, 2017). Such instruments narrow the space of individual choice at the level of execution by relocating judgment to the system level, where rules, criteria, and thresholds are designed *ex ante*. Recent public administration research further emphasises that automated decision-making should be conceptualised as a reconfiguration of authority and control within administrative systems rather than as a mere technological upgrade, insofar as it redistributes decision-making power across organisational levels and procedures (Roehl & Hansen, 2024).

In contemporary approaches to algorithmic governance, this shift is described as the delegation of regulatory functions to algorithmic systems capable of making or executing decisions without direct human intervention (Yeung, 2017). Crucially, this does not concern decision support, where systems merely inform officials, but automated intervention aimed at achieving predictability, standardisation, and control by minimising the role of individual choice at the stage of execution. It is in this sense that automation constitutes a relevant object for analysing the political nature of administrative decisions. From this perspective, automated decision-making ADM operates as a form of governance in which questions of good administration and good governance are addressed not through *ex ante* political justification, but through ex post procedural evaluation and compliance with formal standards (Roehl & Hansen, 2024). In publi c administration practices, ADM operationalises the delegation of administrative decisions through standards, checklists, and automated calculations that translate case assessment into a routinised process of data collection, processing, and entry. Within the logic of street-level bureaucracy, such instruments are employed to unify decision execution under conditions of resource scarcity and time constraints, where outcomes are determined by predefined rules rather than situational assessment of individual cases (Camillo, 2017). In this regime, the decision is implemented not as an act of direct weighing of alternatives in the interaction between an official and an addressee, but as the execution of a logic embedded in the system. As a result, administrative decision-making increasingly functions at the system level, where governance concerns are articulated in terms of procedural robustness, consistency, and accountability frameworks rather than individual judgment (Roehl & Hansen, 2024).

The key characteristic of ADM is therefore not the elimination of choice, but a change in its localisation. In the process of automation, power is shifted from the level of frontline execution to the system level of designing rules, criteria, thresholds, and categories that predetermine possible decision outcomes. The transition from street-level to system-level bureaucracy is accompanied by the transfer of control over decisions from frontline officials to analysts and system designers who construct the parameters of decision-making (Camillo, 2017). In this configuration, the legitimacy of decisions is increasingly anchored in system design and procedural conformity, rather than in the situational reasoning of individual administrators (Roehl & Hansen, 2024). In this respect, ADM differs fundamentally from AI-assisted decision support. While decision support systems inform or structure the decision-making process while leaving responsibility with the official, automated decisions involve direct execution or intervention without an actual human act of decision-making, which constitutes their specific administrative feature (Yeung, 2017). It is precisely this distinction that makes ADM a relevant object for analysing transformations of the political dimension of administrative decisions.

Unlike ADM, AI-assisted decision support does not replace judgment, but merely channels attention and structures the informational environment of choice. In classical administrative theory, rules and information are understood as instruments of bounded rationality that guide decision-making processes without assuming responsibility for choice itself (Mintrom, 2016). The fundamental difference between decision support and automation lies not in the level of technological complexity, but in the localisation of judgment. As K. Yeung (2017) emphasised, algorithmic regulation is not a form of decision support, since it entails execution or intervention without contemporaneous human judgment. This distinction makes it possible to clearly differentiate supportive digital tools from automated decisions in public administration.

Automation in public administration does not eliminate the political dimension of administrative decision-making, but systematically transforms the way in which it manifests itself. While classical approaches associate the political nature of governance with discretion, personalised judgment, and a visible act of choice at the level of execution, under conditions of automation it increasingly emerges outside the immediate moment of decision-making – within the design of procedures, criteria, metrics, and systems that predetermine possible outcomes. In this configuration, political judgment is exercised upstream, at the level of system design, rather than in situational administrative interaction. To analytically capture this transformation, this section does not propose an exhaustive typology of the effects of automation, but instead identifies key points of shift through which the political dimension of administrative decision-making is transformed. These shifts do not concern isolated technical or organisational changes, but rather structural transformations that affect the basic conditions of politicality in governance – namely, how decisions are legitimised, where responsibility is localised, in what form conflict is artic-

ulated, and how visible political choice remains. In this sense, the identification of four shifts – the shift in legitimacy, the shift in responsibility, the shift in conflict, and the shift in the visibility of the political – is not arbitrary. These shifts correspond to four analytical dimensions within which classical theories of public administration and political theory typically locate the political nature of decisions: public justification, personal accountability, open value conflict, and the possibility of articulating the political in the public sphere. It is precisely these dimensions that are systematically transformed under conditions of automated and algorithmic governance.

The proposed approach does not seek to reduce the politicality of automation to a specific technology or type of system. On the contrary, it demonstrates that the key transformations occur regardless of the level of technological complexity – from formalised procedures and standards to algorithmic and AI-based systems. Each of the identified shifts captures not an "effect of AI", but a change in the way administrative decision-making itself is organised. Thus, analysing points of shift makes it possible to move beyond viewing automation as an instrumental or technical innovation and to conceptualise it as a factor transforming the political ontology of public administration. What is at stake is not the depoliticisation of governance, but a change in the forms through which the political becomes present, visible, and contestable in contemporary decision-making regimes.

Shift from public to technical legitimacy

In classical models of public administration, the legitimacy of an administrative decision is grounded in the possibility of its public justification. A decision is considered acceptable not merely because it complies with a procedure, but primarily because it can be explained in terms of reasons, goals, and value priorities that are intelligible beyond the internal logic of the administrative system. Even under conditions of high formalisation, governance retained the requirement that decisions could be questioned, politically contested, or justified in the public sphere. In the process of automation, this regime of legitimacy undergoes a significant shift. As J. Habermas (1968) argued, as scientific and technical rationality becomes embedded in social institutions, traditional forms of legitimacy are gradually displaced by appeals to efficiency, necessity, and systemic functionality. The question "why is this decision acceptable?" is replaced by the assertion "this is required by the rationality of the system", where legitimacy no longer depends on the articulation of reasons but on conformity with technical form. In this sense, technical form does not eliminate political motivation but conceals it by presenting it as objective necessity. For J. Habermas, this rationalisation does not neutralise power; rather, domination becomes technically justified and less visible, as legitimacy is secured by procedures, standards, and systems that function as carriers of authority rather than by public deliberation.

This shift is clearly illustrated by D. Beer's (2016) analysis of the role of metrics in contemporary governance. Numerical indicators and measurement systems perform not only an informational but also a legitimating function: decisions grounded in metrics appears objective and impersonal, as if they had directly "emerged" from data rather than from choice. In this mode, numbers replace arguments, and the correctness of calculation substitutes for political justification. Metrics make it possible to implement administrative decisions without their explicit political articulation, transforming complex value choices into outcomes presented as technically determined. Recent analytical and policy-oriented accounts of data-driven governance make this transformation of legitimacy explicit by framing administrative decision-making as a function of data collection, processing, and interpretation (Haitsma & Brink, 2025). Within this perspective, legitimacy is increasingly attributed to the quality of data inputs, the design of analytical models, and the robustness of decision-support infrastructures, while questions of value choice and democratic authorisation are treated as external to the decision process itself. Decisions are thus described as legitimate because they are "data-informed" or "data-driven", implying that correctness follows from the proper functioning of the informational and procedural pipeline rather than from deliberative validation, a logic already identified in D. Beer's (2016) analysis of metric-based governance.

Within contemporary public administration research, this transformation of legitimacy is explicitly institutionalised in the context of automated decision-making. As U.B.U. Roehl & M.B. Hansen (2024) demonstrated, ADM systems are not legitimised through public justification of individual decisions, but through their conformity with predefined procedures, standards, and governance frameworks that are assessed ex post. Legitimacy is thus anchored in procedural robustness, compliance, and system design, whereby questions of acceptability are addressed through audits, safeguards, and formal accountability mechanisms rather than through political contestation. In this sense, what J. Habermas (1968) described as technocratic legitimation becomes operationalised in public administration as a routine mode of governing through automated systems, in which legitimacy is embedded in decision-making infrastructures rather than articulated through reasons accessible to affected publics (Haitsma & Brink, 2025). A similar mechanism is described by F. Pasquale (2015) in his analysis of algorithmic decision-making systems. He shows that an increasing number of administrative decisions are legitimised not through explanations of their underlying grounds, but through references to the formal correctness, complexity, and alleged autonomy of algorithmic procedures. In this sense, the algorithm functions as a "black box" within which normative and institutional assumptions are concealed, while externally the outcome is presented as neutral and inevitable. What appears in F. Pasquale's account as opacity and concealment

is subsequently reproduced in policy-oriented discourse in a proceduralised and normalised form.

Building on these critical diagnoses, contemporary policy-oriented approaches to algorithmic governance reproduce this shift in legitimacy in a particularly explicit form. In recent discussions of generative AI in the public sector, legitimacy is increasingly framed as a function of procedural safeguards – risk assessments, ethical checklists, transparency mechanisms, and governance frameworks designed to ensure "responsible" AI use (Esposito & Tse, 2024). Here, governance is presented as legitimate insofar as it follows formally specified processes of data governance, model oversight, and risk management, regardless of whether the underlying policy goals or value priorities have been subject to democratic contestation (Haitsma & Brink, 2025). Political choice is thereby translated into questions of procedural adequacy, institutional design, and technical risk mitigation.

Taken together, these approaches allow the shift in legitimacy to be described as a transition from public justification to technical authority. An administrative decision is recognised as legitimate not because it is convincingly justified in the public sphere, but because it conforms to the formal logic of a system, metric, or algorithm. Legitimacy is thus effectively "pre-packaged" within data infrastructures and decision procedures themselves, rather than emerging from processes of public reasoning and contestation (Haitsma & Brink, 2025). Even when framed as "ethical" or "responsible", such legitimacy remains grounded in procedural correctness rather than in democratic articulation of alternatives (Esposito & Tse, 2024). The political dimension does not disappear in this process, but becomes less visible: it is relocated to the design of procedures, criteria, and models that determine what counts as rational, efficient, and permissible. It is precisely in this transformation that the first key point of shift can be identified – through which automation reshapes the political dimension of administrative decision-making.

Importantly, empirical research on public attitudes toward automated decision-making indicates that this shift toward technical authority is not socially self-evident. Comparative studies of public perceptions suggest that procedural correctness and technological sophistication alone are insufficient to secure legitimacy for automated administrative decisions (Haitsma & Brink, 2025). More detailed empirical analyses by A. Kaun *et al.* (2024) further demonstrate that public acceptance of automated decision-making varies significantly across administrative domains and national contexts. In Estonia, public acceptance of automated decision-making tends to be higher in low-risk and routine administrative domains, but declines where decisions affect individual rights or provide limited opportunities for appeal. In Sweden, citizens display stronger expectations of human involvement and contestability, particularly in high-stakes welfare-related decisions, despite generally high levels of institutional trust. In Germany, scepticism toward automated decision-making is closely associated with concerns about legal accountability and the ability to challenge decisions through formal procedures. Across these cases, public trust depends less on technical correctness as such than on the perceived availability of responsibility, justification, and meaningful avenues for contestation, indicating that legitimacy grounded in technical and procedural authority remains contingent and context-dependent rather than socially guaranteed (Kaun *et al.*, 2024).

Taken together, these dynamics indicate that automation does not simply modify how administrative decisions are made, but restructures the very grounds on which they are recognised as legitimate. Public justification is increasingly displaced by technical authority embedded in procedures, metrics, and decision infrastructures, while political choice is relocated to the design of systems rather than articulated in the public sphere. As a result, legitimacy becomes less a matter of contestable reasons and more a property of institutionalised technical forms – a transformation that reconfigures, rather than eliminates, the political dimension of administrative decision-making.

Shift in the localisation of responsibility

In automated regimes of public administration, administrative decisions continue to produce real and often significant consequences for individuals, yet they can increasingly rarely be attributed to a clearly identifiable responsible subject. The decision no longer appears as the outcome of an act of human judgment, but rather as an effect of the functioning of a system organised around procedures, standards, and automated execution. In contemporary techno-scientific regimes of governance, responsibility is systematically displaced from individual judgment to risk assessment procedures and expert frameworks, enabling politically consequential decisions to be taken without clearly defined personal authorship (Jasanoff, 2016).

Recent political studies of automated governance by A. Öjehag-Pettersson *et al.* (2024) identified this displacement of responsibility as one of the core transformations introduced by algorithmic systems, alongside shifts in visibility, legitimacy, and modes of contestation. In this context, algorithmic systems do not create an entirely new problem of responsibility, but rather radicalise an already existing logic of its alienation. Responsibility formally remains in place, yet it is relocated away from the moment of decision-making toward the level of procedural architecture, which significantly complicates its localisation (Yeung, 2017). A key mechanism of this shift lies in the delegation not only of execution, but of the very structure of choice to automated systems. Decision parameters are defined *ex ante* – at the stages of programming, translating legal norms into code, and setting target indicators – while direct interaction with the addressee is reduced to the automatic application of a pre-defined logic. Recent analyses of (semi-)automated administrative decision-making by L. Haitsma & B. Brink (2025) further showed that this diffusion of responsibility is reinforced by governance models that replace direct human intervention with

formally structured "human involvement", in which responsibility is distributed across data inputs, models, indicators, and institutional procedures rather than concentrated in an identifiable decision-maker. In such configurations, accountability is preserved at the level of system design and oversight, while becoming increasingly detached from concrete decision outcomes.

Empirical research on citizen attitudes toward automated decision-making suggests that this responsibility gap is not only an analytical or institutional problem, but also a socially experienced one. Studies A. Kaun *et al.* (2024) showed that public trust in automated administrative decisions decreases when individuals cannot identify who is responsible for correcting errors or when meaningful avenues for appeal are absent. Across different administrative contexts, including Estonia, Sweden, and Germany, expectations of human intervention and contestability function as key markers of perceived fairness, indicating that the diffusion of responsibility in automated governance is directly reflected in patterns of public unease and distrust. This transformation is described by S. Zouridis *et al.* (2019) as a transition to system-level decision-making, in which the information system becomes the core of bureaucracy and decisions emerge as the result of continuous procedural production rather than a single act of will. Discretion does not disappear in this process, but is relocated from professional frontline officials to system designers, programmers, and data analysts who define the parameters of decision-making. This creates a structural gap between those who are affected by decisions and those who effectively shape their underlying. In regimes of risk governance, responsibility is transformed from an act of judgment into compliance with procedures and standards, where the criterion of adequacy becomes the correctness of execution rather than the substantive justification of the decision itself (Jasanoff, 2016).

Contemporary policy-oriented approaches to algorithmic governance attempt to address this diffusion of responsibility through the introduction of formal governance frameworks, ethical oversight mechanisms, and risk management procedures. For example, recent proposals for the governance of generative AI in the public sector, proposed by M. Esposito & T. Tse (2024), emphasise steering committees, accountability matrices, and procedural safeguards as means of ensuring "responsible" AI use. However, such frameworks primarily redistribute responsibility across institutional arrangements rather than re-establishing a clearly identifiable author of administrative decisions. Responsibility is thereby managed, documented, and audited, but not re-personalised.

This gap is further deepened by the opacity of algorithmic systems. The combination of technical complexity and legal secrecy makes it impossible to reconstruct the logic of a decision and, consequently, to identify a responsible subject or to effectively contest the outcome (Pasquale, 2015). At the same time, within the logic of algorithmic governmentality, decisions are increasingly neither addressed to nor derived from a subject: they are based on statistical correlations and profiles rather than on the actions of concrete individuals (Rouvroy & Berns, 2013). From the perspective by A. Öjehag-Pettersson *et al.* (2024), this responsibility gap is therefore not an accidental failure or a case of malfunction, but a structural feature of governance through automated systems, in which accountability is institutionally affirmed yet practically elusive. Under such conditions, the responsibility gap emerges not as an accidental defect or a result of abuse, but as a structural property of automated governance, in which responsibility exists institutionally yet becomes practically unreachable.

Shift in political conflict under algorithmic governance

Under conditions of algorithmic governance, political conflict does not disappear but undergoes a profound transformation: it loses the form of an open value-based dispute and is translated into the technical language of models, data, and indicators. As A. Rouvroy & T. Berns (2013) demonstrated, algorithmic governmentality is grounded in statistical normativity, which is non-discursive in nature and does not rely on conventions of equivalence that traditionally enabled political contestation and compromise. Within such a regime, social and value-based normativities are not eliminated, but systematically neutralised, insofar as they resist digital translation and therefore cannot be incorporated into the algorithmic logic of decision-making. Importantly, this neutralisation operates not merely at the level of outcomes, but at the level of knowledge production itself: algorithmic systems privilege abstract, generalised, and decontextualised forms of knowing, thereby excluding situated and experiential forms of political claim-making that cannot be rendered legible within model-based representations (Maalsen, 2023).

This transformation of conflict is further reinforced by governance approaches that explicitly frame administrative decision-making as a technical process of data interpretation and system optimisation, within which disagreement is addressed not as a political claim but as an input to be managed or corrected. In such configurations, conflict is not denied but is rendered operationally irrelevant, insofar as it cannot be translated into parameters, indicators, or performance metrics within the decision-making architecture (Haitsma & Brink, 2025). Empirical research on citizen attitudes toward automated decision-making provides further evidence of this transformation of conflict. A. Kaun *et al.* (2024) showed that negative perceptions of automated governance – such as distrust, unease, or perceived unfairness – rarely translate into articulated political demands or collective contestation. Instead, across different administrative contexts, including Estonia, Sweden, and Germany, such reactions tend to remain individualised and affective, lacking a shared language through which they could be expressed as political claims. As a result, conflict persists at the level of experience, but does not enter the political arena as an object of deliberation or contestation.

This shift has a clear institutional foundation. As S. Jasanoff (2016) showed, in contemporary technocratic regimes of governance, questions concerning the permissibility of a given course of action – questions such as "should this be done at all?" – are formally acknowledged as political and value-laden, yet are deliberately excluded from procedures of technical risk assessment. As a result, the most fundamental conflicts are not resolved but are structurally excluded from decision-making processes. Technical procedures do not resolve value-based disagreements; rather, they circumvent them, leaving them outside the operational rationality of governance. From an epistemological perspective, this exclusion reflects a deeper asymmetry between what algorithmic systems can know and what political conflict requires to be articulated: while governance increasingly relies on scalable and standardised representations, political disagreement is rooted in context-dependent experiences that resist such abstraction (Maalsen, 2023). Under such conditions, political disagreement can manifest only in the form of technical critique. Questions of justice, legitimacy, or social harm are reduced to issues of model correctness: data quality, classification accuracy, the presence of bias, or compliance with performance indicators. As S. Jasanoff (2016) emphasised, quantification itself is an act of framing: assigning numerical values entails a choice regarding what counts as relevant and what is rendered secondary, and thus constitutes a politically charged decision. That which cannot be measured – such as experiences of exclusion, dignity, or social vulnerability – systematically falls outside the scope of decision-making, even when it is critically important for public welfare. As S. Maalsen (2023) argued, algorithmic harm emerges precisely at this point of epistemic mismatch, where lived experience and situational vulnerability are rendered invisible because they cannot be translated into the system's dominant modes of representation.

As a consequence, negative outcomes or social harm do not become grounds for a political reconsideration of the system's goals. As A. Rouvroy & T. Berns (2013) argued, errors and failures are interpreted not as challenges to legitimacy, but as misfires that call for further optimisation and reintegration into the model. Error does not call the system into question; instead, it is transformed into a resource for its improvement. In this logic, harm is not recognised as a signal of normative failure, but is reframed as a technical anomaly, reinforcing a governance regime in which political critique is systematically displaced by epistemic correction (Maalsen, 2023). In this logic, conflict is not resolved but absorbed by technical procedures of correction. The empirical dimension of this shift is clearly documented in secondary reviews of V. Eubanks' work empirical work on automated welfare systems conducted by F. Gordon (2019) and J. Bevan (2020). These reviews highlight that appeal mechanisms in automated systems of social administration focus primarily on correcting individual data points or classifications, without opening space to contest the underlying logic of allocation, categorisation, or risk profiling. Structural inequality is decomposed into a series of private technical errors, while public political debate over the system's goals, values, and acceptable consequences is effectively absent. This pattern exemplifies what S. Maalsen (2023) described as the displacement of political claims into individualised sites of remediation, where harm is addressed case by case without recognition of its structural or epistemic origins.

This condition can be normatively specified as a form of domination rather than a mere governance failure. Drawing on a relational and egalitarian perspective, L. Naudts (2024) conceptualised data-driven decision-making systems as socio-technical arrangements that unjustifiably limit both self-determination and the capacity to contest collective goals, thereby transforming political disagreement into structurally inaudible claims. In such environments, individuals may encounter harm and exclusion without access to institutionalised channels capable of recognising these experiences as political grievances, rather than as isolated technical anomalies. This reduction of political conflict to technical remediation is further reinforced by contemporary governance frameworks for AI in the public sector. Policy-oriented approaches to algorithmic governance increasingly conceptualise disagreement and harm as risks to be mitigated through improved oversight, procedural safeguards, and system optimisation (Esposito & Tse, 2024). Within such frameworks, conflict is not articulated as a contestation of goals or distributive priorities, but as a problem of governance design, compliance, and risk management. Political antagonism is thus reframed as a managerial challenge, to be addressed through better coordination and control rather than through democratic confrontation. In epistemic terms, such frameworks treat harm as a failure of implementation rather than as evidence of contested values embedded in system design (Maalsen, 2023). What is displaced in this process is not conflict as such, but the possibility of democratic entry into the definition of system goals, priorities, and acceptable trade-offs.

In sum, conflict is not eliminated but deprived of the language through which it could be articulated as political. From a relational perspective, the absence of such language does not signal consensus but the persistence of unresolved domination, insofar as the conditions for articulating and contesting injustice are structurally foreclosed (Naudts, 2024). Algorithmic governance thus produces not a post-conflict order, but an epistemically constrained one, in which political antagonism persists while being systematically misrecognised as a technical problem (Maalsen, 2023). Technical disputes over data, indicators, or model accuracy function only as symptoms of a deeper unresolved value-based antagonism, which, under conditions of algorithmic governance, lacks a legitimate arena for public articulation (Jasanoff, 2016). As a result, political conflict persists not as an object of democratic deliberation, but as a residual and fragmented experience that cannot be collectively articulated or institutionally addressed. In this sense, algorithmic governance does not resolve

conflict but reorganises it into a technically mediated and politically muted form.

Shift in the visibility of the political

Studies by A. Öjehag-Pettersson *et al.* (2024) of automated and algorithmic governance increasingly emphasise that one of the key political effects of automation lies not in the elimination of political choice, but in its reduced visibility and altered modes of appearance. This reduced visibility should be understood not only as an institutional or communicative problem, but as an epistemological one, rooted in how algorithmic systems delimit what can count as relevant knowledge and, consequently, what can appear as political (Maalsen, 2023). Under conditions of algorithmic and data-driven governance, the political dimension of administrative decisions does not disappear but changes the form of its presence. Political choice increasingly ceases to appear as an explicit decision, a public justification, or an identifiable act of will. Instead, it becomes embedded in the formalised elements of governance systems – classification criteria, thresholds of acceptability, risk categories, data structures, and algorithmic models. It is precisely this infrastructural embeddedness that produces the effect of the invisibility of the political: not because choice is absent, but because it is no longer articulated as choice.

In the concept of algorithmic governmentality, A. Rouvroy & T. Berns (2013) proposed an ontology of governance in which the political is localised neither in the subject nor in the moment of decision. Governance operates not through addressing autonomous individuals, but through the management of statistical norms, correlations, and profiles – the so-called "statistical doubles". In this regime, norms are not formulated as value-based prescriptions but appear to "emerge" directly from reality, insofar as knowledge is grounded not in causal explanation but in statistical relations. Normativity thus takes on the appearance of factuality and is perceived as immanent to reality itself rather than as the outcome of political choice. As a result, the political becomes difficult to detect: it dissolves into the organisation of the environment of action rather than appearing in the form of speech, argumentation, or decision. Maalsen's concept of situated algorithmics clarifies this process by showing that such claims to objectivity depend on the exclusion of context-dependent perspectives, through which political meaning would otherwise become visible (Maalsen, 2023).

This logic does not eliminate the political, but systematically removes subjectivity from view. Data are presented as signals "purified" of interpretation, correlations as neutral relations, and algorithmic actions as the mere application of a profile to an environment. Governance increasingly operates not through prohibition or command, but through the subtle calibration of conditions under which certain behavioural trajectories become more probable while others become less accessible. Political choice in such a regime is neither declared nor justified; it operates through the environment, which guides conduct without addressing the subject directly (Rouvroy & Berns, 2013). This transformation of political choice into an infrastructural condition is further reinforced in contemporary platform-based forms of algorithmic governance. Political decisions are increasingly perceived as technically necessary outputs of complex systems rather than as choices open to public justification. In such configurations, governance operates through environments and interfaces that structure conduct without rendering the underlying normative assumptions visible or contestable. The infrastructural dimension of this invisibility is analysed in detail by R. Kitchin (2014) in his work on data-driven governance. He demonstrates that political choice is localised not in the act of decision-making but in data infrastructures – specifically in practices of data collection, cleaning, categorisation, and modelling. Data do not merely represent reality; they actively participate in its construction, stabilising particular ways of seeing the world as technically necessary and self-evident. Once institutionalised, such classifications become difficult to contest, as they are perceived as infrastructural facts rather than as the outcomes of normative choice.

Whereas in A. Rouvroy's account the invisibility of the political has an ontological character, in F. Pasquale's (2015) work it acquires a clearly articulated institutional dimension. The concept of "black-box governance" demonstrates that opacity is not a byproduct of complexity but an actively maintained regime of power that combines technical complexity, legal secrecy, and deliberate obfuscation. Value judgments are embedded in coded rules, algorithms, and rankings that have significant distributive consequences yet remain inaccessible to understanding and contestation. The result is an asymmetric regime of visibility, which F. Pasquale described as a "one-way mirror": power observes and evaluates, while itself remaining opaque. The political meaning of this invisibility becomes particularly clear when interpreted through the work of C. Mouffe (2005). If the political is understood as the dimension of antagonism and unavoidable exclusion, its invisibility does not entail the disappearance of conflict. Rather, it signals the loss of a legitimate form of articulation, as political decisions are presented as technical or expert-based rather than as objects of public choice. Antagonism does not vanish but is displaced beyond the democratic space, deprived of language, institutions, and an addressable audience to which claims can be directed. From an epistemological perspective, this displacement can be understood as a form of exclusion from intelligibility: political claims grounded in lived experience fail to register as meaningful within dominant algorithmic modes of knowing (Maalsen, 2023).

From the perspective of A. Öjehag-Pettersson *et al.* (2024), these ontological, infrastructural, and institutional mechanisms jointly contribute to a systematic depoliticisation-through-invisibility, in which political choice persists but becomes increasingly difficult to identify, articulate, and contest within democratic arenas. In this sense, formalisation functions not as a neutral instrument of

ordering but as a condition for the invisibility of the political. Political choice becomes less perceptible not because it no longer exists, but because it is translated into the form of standards, models, or infrastructures. The consequence is a growing difficulty of democratic control, a weakening of accountability, and a narrowing of the space for legitimate contestation. The political does not disappear – it ceases to appear as political, operating instead under the guise of technical necessity.

Why AI intensifies these shifts

Recent political studies increasingly conceptualise automated and AI-based governance not as a purely technical development, but as a transformation of political ordering itself, involving shifts in responsibility, visibility, legitimacy, and contestation (Öjehag-Pettersson *et al.*, 2024). Automation in public administration has long ceased to be synonymous with the simple execution of predefined rules. In the case of AI, a different mode is observed, in which automation combines large-scale data-based knowledge, prediction, and (partially) autonomous execution of administrative decisions. It is precisely this triad: Big Data → prediction → execution – that distinguishes AI from classical rule-based automation and creates the conditions for the radicalisation of structural shifts in the political dimension of governance (Fortes *et al.*, 2022). Unlike "if-then" models, in which norms are formally defined *ex ante*, in AI-based systems norms are increasingly derived from data and predictive models. Decisions rely not on the textual formulation of rules but on statistical assessments of probabilities, while their execution approaches semi-automatic or self-executing modes. In this configuration, governance functions not as a series of discrete decisions but as an environment that continuously generates knowledge and adjusts its own operations. This is what L. Diver (2021) described as algorithmic regulation – a regime of continual computational generation of knowledge from data with automatic refinement of system operations. From an epistemological perspective, this shift implies that governance increasingly operates through forms of knowledge that privilege generalisability, prediction, and scalability over situated judgment, thereby transforming how responsibility can be attributed.

Empirical studies by L. Haitsma & B. Brink (2025) further illustrated how this mode of governance reframes disagreement and intervention as technical matters of system performance rather than as sites of political judgment. In such settings, human involvement is primarily articulated in terms of system supervision or correction, while contestation is redirected toward the optimisation of processes instead of the articulation of competing values or goals. This transformation also entails a profound reconfiguration of human agency in governance. In such regimes, political and administrative power is exercised indirectly – through architectures, interfaces, and data-driven feedback loops – rather than through identifiable acts of will. Importantly, in this regime automation ceases to function as a neutral auxiliary technique. Already at the level of defining automated decision-making, it is acknowledged that algorithmic systems may not only support but effectively replace human decision-making in public functions (Sever, 2023). The issue is therefore not the degree of automation, but a transformation in the very mode of norm production and the exercise of power. AI shifts governance into a data-driven, adaptive regime in which norm-setting, justification, and execution merge into a single infrastructure. It is this structural transformation that allows shifts in legitimation, responsibility, conflict, and the visibility of the political to become systemic and durable.

In AI-based algorithmic governance, the legitimation of administrative decisions increasingly relies less on public reason-giving and more on the epistemic authority of technical systems. Decisions are presented as outcomes of model architecture, datasets, and probabilistic outputs rather than as results of political deliberation among alternatives (Gritsenko & Wood, 2020; Diver, 2021). In this sense, algorithmic governance functions as a de facto design-based normative framework in which code and technical protocols determine norms and resource allocation without direct participation of democratic procedures. This shift in legitimation is accompanied by a transformation in the epistemological status of knowledge in governance. Instead of articulating reasons, values, and goals, decisions are increasingly justified by references to predictive accuracy, data scale, or the scientific objectivity of models. Political and normative complexity is thereby reduced to a cybernetic logic of optimisation, within which decisions appear technically necessary rather than politically chosen (Diver, 2021).

Normative assumptions in this regime do not become objects of public debate but are embedded directly in the technical architecture of systems – through the selection of variables, thresholds, metrics, and objective functions. Legitimation thus increasingly bypasses open discourse and is realised through infrastructures perceived as neutral and objective. In broader political terms, this corresponds to an understanding of technologies as forms of social ordering capable of shaping conditions of action and distributions of opportunity beyond explicit political processes (Koenig, 2025). As a result, the legitimation of administrative decisions in AI-based regimes effectively "moves" from the public sphere into models, data, and predictions, while appeals to the system's epistemic superiority ("the model shows") become a new formula of administrative authority (Fortes *et al.*, 2022). Political choice does not disappear in this configuration, but it loses its visibility as a choice subject to public justification and contestation.

One of the key effects of introducing AI into public administration is the radicalisation of the shift in responsibility. Unlike classical automation, where decisions can still be localised in institutionally defined acts, AI-based algorithmic systems fragment decision-making processes across data, models, optimisation parameters, and execution infrastructures. As a result, responsibility ceases to be

linked to a concrete subject and increasingly dissolves into system design and its technical preconditions (Fortes *et al.*, 2022). This diffusion of responsibility is reinforced epistemologically by the framing of algorithmic outcomes as data-driven inferences rather than as discretionary judgments, which weakens the grounds on which responsibility can be claimed, contested, or assigned (Maalsen, 2023).

This effect is particularly pronounced in regimes of algorithmic regulation, where no identifiable human author of the decision exists. Instead of reason-giving that allows for normative justification and political contestation, decision recipients encounter technical explanations that neither reconstruct the logic of choice nor allow the system's goals themselves to be questioned. According to L. Diver (2021), the loss of an identifiable responsible subject and the reduction of participation and contestability are systemic features of this governance regime. The administrative-practical dimension of this problem is well illustrated by the distinction between formal and substantive ADM. In the former case, decisions are fully automated and made without human judgment; in the latter, algorithms formally support human actors but effectively determine the boundaries of acceptable decisions (Sever, 2023). Even where a "human in the loop" exists, authorship may be fictitious, as the human role is reduced to confirming system outputs. This effect is further reinforced by automation bias and the "black box" problem, which make critical evaluation of algorithmic decisions institutionally difficult.

Empirical clarity to this shift is provided by the case of algorithmic profiling of job seekers in Austria described by D. Allhutter *et al.* (2020). In this system, classification decisions are not made by individual officials but emerge from a predictive model scaled across the entire user population. Employment service staff are required to rely on profiling outcomes but are not the authors of the decisions, resulting in the diffusion of responsibility across models, data, and organisational architecture. From the perspective of algorithmic epistemologies, such cases illustrate how harm and exclusion can occur without producing a corresponding locus of responsibility, as outcomes are attributed to model behaviour rather than to political or administrative choice (Maalsen, 2023). The opacity of criteria and the lack of effective appeal mechanisms further remove political choice from the public sphere.

AI also intensifies the shift in political conflict. Instead of open clashes of values, disputes are increasingly reduced to technical critiques – of data quality, predictive accuracy, or bias. Political choice does not disappear in this regime, but it loses its own language and is masked as technical necessity (Fortes *et al.*, 2022). Criticism is articulated in terms of accuracy, performance, or explainability, creating an illusion of neutrality while displacing questions of goals and justice to the periphery of governance discourse. This effect is particularly evident in the Austrian job-seeker profiling case, where austerity policies are implemented through optimisation criteria and statistical models. Social decisions are presented as neutral outcomes of data processing, while any critique of the system is reduced to technical parameters rather than debates over normative policy priorities (Allhutter *et al.*, 2020). In this sense, AI radicalises the shift in the visibility of the political. Normative decisions are increasingly enacted not through laws, debates, or administrative acts, but through system architectures and algorithmic environments that shape conditions of action without explicit political articulation. Technologies thus function as instruments of social ordering, influencing behaviour and opportunity distributions without naming themselves as politics. Taken together, these dynamics correspond to what A. Öjehag-Pettersson *et al.* (2024) described as a reconfiguration of governance through automated systems, in which responsibility, visibility, and democratic contestation are systematically displaced from the public sphere into socio-technical infrastructures.

In conclusion, AI does not eliminate the political dimension of administrative decisions but relocates it into an infrastructural domain. Political choice is not abolished but embedded in code, models, and data; conflict is not resolved but masked as a technical problem. Responsibility, in turn, is neither denied nor assumed, but rendered structurally elusive – distributed across epistemic assumptions, system architectures, and predictive logics that resist political attribution. For this reason, AI-based automation constitutes a new regime of politicality – less visible, less localised, and significantly more difficult to subject to democratic control and public contestation.

Conclusions

This article demonstrated that automation in public administration transforms the political dimension of decision-making structurally rather than eliminating it. Politicality is relocated from the immediate moment of decision-making to the *ex ante* design of procedures, models, and infrastructures. Technical analysis of automation is insufficient, as it fails to reveal where political choice is produced. Automation shifts political power from visible acts of judgment to durable, less perceptible system-level arrangements. The analytical framework based on "points of shift" allows this transformation to be systematically captured in governance structures. The shift in legitimation shows how public justification is replaced by the procedural and technical authority of procedures, metrics, and algorithms. The shift in responsibility reveals a structural diffusion of authorship as responsibility can no longer be localised in individual judgment but is distributed across system components. The shift in conflict demonstrates how political disagreements are translated into technical disputes over model correctness and data quality, thereby losing their capacity for value-based articulation. Finally, the shift in the visibility of the political highlights how normative assumptions are embedded in governance infrastructures and withdrawn from explicit political articulation.

AI-based systems radicalise these shifts by creating an adaptive and self-correcting mode of governance. In this configuration, norms derive from data and statistical

models rather than predefined rules; justification is reduced to the epistemic superiority of the system; and execution approaches infrastructural automatism. This makes political choice less visible but more stable and scalable. The findings of this study supported a broader theoretical claim that the problem of automation transcends the replacement of humans by machines. It concerns a transformation in how power is exercised, where decisions appear as effects of system-level processes rather than identifiable acts of choice. In this sense, AI-driven automation reconfigures politicality into a regime less localised, less personalised, and more resistant to democratic control.

At the same time, the analysis exposed unresolved conceptual tensions requiring further theoretical development. First, contemporary approaches regulating automated systems focus primarily on procedural safeguards – transparency, explainability, accountability, and human oversight. While necessary, they often remain blind to the political dimension of system-level design choices, including the selection of goals, metrics, categories, and models that shape administrative decisions prior to formal adoption. This creates a risk of regulatory reductionism, whereby the politicality of automation is excluded from legal and democratic analysis. Second, automated governance renders classical distinctions – between "tools" and "decisions", "support" and "replacement", or "human-in-the-loop" – analytically insufficient. These categories obscure how power is exercised through infrastructural arrangements through which norms, categories, and outcomes are stabilised.

This framework provides a basis for further research into the politicality of automated governance as a form of social ordering. Future studies must analyse political choice at the level of system design and epistemic authority. Understanding automation as a transformation – rather than elimination – of the political is a precondition for advancing regulatory approaches and democratic oversight in the age of AI.

Acknowledgements

None.

Funding

None.

Conflict of Interest

None.

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Політичний вимір прийняття адміністративних рішень в умовах автоматизації: структурні зрушення в публічному управлінні

Михайло Янишівський
Доктор філософії з публічного управління та адміністрування, асистент
Національний університет «Львівська політехніка»
79013, вул. Степана Бандери, 12, м. Львів, Україна
https://orcid.org/0000-0002-8788-6339

Анотація. Стаття мала на меті пояснити, яким чином автоматизація структурно трансформує політичний вимір прийняття адміністративних рішень у публічному управлінні. Замість того щоб розглядати автоматизацію як суто технічну або організаційну інновацію, у дослідженні вона концептуалізована як управлінська практика, що перерозподіляє судження, відповідальність і легітимність у межах адміністративних систем. Спираючись на сучасні теорії бюрократії та алгоритмічного врядування, у статті обґрунтовано тезу про те, що автоматизація не усуває політичний вибір, а зміщує його з моменту індивідуального прийняття рішень до етапу проєктування процедур, моделей та інфраструктур, які наперед визначають можливі результати управління. Для аналітичного осмислення цієї трансформації у статті запропоновано концепт «точок зсуву», через які автоматизація змінює політичний вимір прийняття рішень. Виокремлено чотири такі зсуви: зсув легітимації від публічного обґрунтування до технічного авторитету; зсув відповідальності від індивідуального судження до архітектури систем; трансформацію політичного конфлікту в технічну критику; а також зростання невидимості політичного вибору внаслідок його інфраструктурного закріплення. Окрему увагу приділено тому, чому саме штучний інтелект (ШІ) інтенсифікує ці зсуви. На відміну від автоматизації заснованої на правилах, системи ШІ поєднують вироблення знань на основі даних, прогнозування та напів автономне виконання, формуючи адаптивні й масштабовані режими управління, у яких нормативні припущення вбудовуються в моделі, а не артикулюються через політичні процеси. У статті зроблено висновок, що автоматизація – особливо заснована на ШІ – не деполітизує публічне управління, а формує новий режим політичної упорядкованості, який є менш видимим, менш локалізованим і значно більш стійким до демократичного контролю. Отримані результати мають практичне значення для політиків, регуляторів і публічних адміністраторів, оскільки вони демонструють, яким чином політичні вибори вбудовуються в дизайн систем та інфраструктурні рішення, сприяючи формуванню більш рефлексивних підходів до регулювання й нагляду за автоматизованим прийняттям рішень

Ключові слова: штучний інтелект; політичний вимір врядування; алгоритмічне врядування; відповідальність; легітимність; політичність; процедурна раціональність

DEMOCRATIC GOVERNANCE
Vol. 19, No. 1, 2026, 20-32
Journal homepage: https://d-governance.com.ua/
Received: 12.01.2026; Revised: 15.04.2026; Accepted: 28.05.2026; Published: 25.06.2026

UDC 35:336:004]:340.13
DOI: 10.56318/dg/1.2026.20

E-ISSN 2070-4038

Public management of sustainable finance: Digital transformation and legal challenges

Serhii Petrukha*
PhD in Economics, Associate Professor
West Ukrainian National University
46009, 11 Lvivska Str., Ternopil, Ukraine
https://orcid.org/0000-0002-8859-0724

Nina Petrukha
PhD in Economics, Associate Professor
Kyiv National University of Construction and Architecture
03037, 31 Povitrianykh Syl Ukrainy Ave., Kyiv, Ukraine
https://orcid.org/0000-0002-3805-2215

Ganna Ortina
Doctor of Public Administration, Professor
Dmytro Motornyi Tavria State Agrotechnological University
69063, 66 Universytetska Str., Zaporizhzhia, Ukraine
https://orcid.org/0000-0003-0266-740X

Ruslan Stuzhuk
Postgraduate Student
Polissia National University
10008, 7 Staryi Blvd., Zhytomyr, Ukraine
https://orcid.org/0009-0007-7902-7714

Dmytro Plakhotnii
Postgraduate Student
National Academy of Management
03041, 15 Ushynskyi Str., Kyiv, Ukraine
https://orcid.org/0009-0000-1627-0310

Abstract. The purpose of the study was to analyse public administration strategies aimed at stimulating investment in a sustainable economy and to assess the possibilities of using artificial intelligence tools to improve the effectiveness of state supervision of financial markets. The paper examined public administration strategies focused on stimulating investment in a sustainable economy, and legal aspects of implementing intelligent systems in decision-making processes that contributed to ensuring financial security and stability of the financial system in the long term. In particular, attention was paid to the issues of transparency of algorithmic decisions, responsibility for the use of automated systems, and protection of financial and personal data in public financial management processes. The results of the study showed that the integration of digital technologies into the public financial management system significantly increased the effectiveness of financial supervision, improved transparency of operations, and developed sustainable financial instruments. However, the successful implementation of these transformations required improving the regulatory framework and creating mechanisms for regulating the use of artificial intelligence in the financial sector. In addition, artificial intelligence, due to its ability to automate big data analysis and quickly identify risks, has significantly improved the effectiveness of financial regulation. This has created legal challenges, in particular, regarding the definition of responsibility for automated decisions. The results of the expert survey confirmed the importance of integrating digital technologies with legal guarantees in order to ensure the ethics and stability of financial markets. The practical significance of the study lies

Suggested Citation:
Petrukha, S., Petrukha, N., Ortina, G., Stuzhuk, R., & Plakhotnii, D. (2026). Public management of sustainable finance: Digital transformation and legal challenges. *Democratic Governance*, 19(1), 20-32. doi: 10.56318/dg/1.2026.20.

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**Corresponding author (psv.03051984@gmail.com)*

in the development of scientifically based approaches to the integration of digital technologies into the public financial management system to ensure financial stability, increase investment activity, and support the long-term development of a sustainable economy

Keywords: digital financial regulation; regulatory technologies; artificial intelligence solutions; sustainable economy; financial security

Introduction

Sustainable development of the financial system has become a key factor in economic security and socio-economic stability of the state. Globalisation, increased financial flows, and competition have increased demands on the effectiveness of public administration, while conventional regulatory mechanisms have often failed to keep up with market changes. Digital transformation, in particular, the use of artificial intelligence and Big Data, has increased the accuracy of forecasting, automated control and contributed to the development of transparent financial institutions. Its implementation was accompanied by legal challenges, in particular, regarding the responsibility of algorithms, data protection, and adaptation of legislation that can affect trust and financial security. A.A. Davidescu *et al.* (2025) noted that digitalisation of public financial management is not just a technical process, but a complex transformational phenomenon that required a combination of technological, organisational, and legal approaches. S. Mirishli (2024) pointed out that the effective implementation of artificial intelligence (AI) in state supervision is possible only if there is an interaction between the technical capabilities of the systems and a clear legal framework governing the use of data, algorithmic solutions, and control mechanisms. The paper by O. Bashtannyk *et al.* (2025) found that the introduction of innovative human capital management practices in the security and defence sector increased the effectiveness of public administration, but simultaneously requires adaptation to new organisational and institutional challenges. O. Sydorchuk *et al.* (2024) proved that the integration of digitalisation into public administration, in particular through spatial planning, contributed to the strengthening of national security and economic development, ensuring more effective management decision-making.

H. Ferdman *et al.* (2025) noted that the development of a matrix of innovative competencies in public administration has become a key factor in ensuring sustainable development, financial efficiency, and national security in the context of digital transformation. The researchers stressed that the integration of digital skills, analytical tools, and strategic thinking helped to improve the quality of management decisions and the adaptability of state institutions to contemporary challenges. The study by S. Kanojia *et al.* (2024) showed that FinTech and RegTech play a key role in ensuring business sustainability by promoting economic growth, financial inclusion, and improving the efficiency of financial systems. The researchers found that RegTech is effective in reducing compliance costs, preventing financial crimes, and improving internal control systems. Simultaneously, the need to balance innovation and regulatory requirements was emphasised, since the introduction of digital financial technologies is accompanied by cybersecurity risks and regulatory uncertainty. C.J. Costa (2024) analysed the ecosystem of decentralised finance (DeFi), which was considered as a new stage in the development of financial systems based on blockchain technologies and smart contracts. The researcher stressed that DeFi creates an alternative financial infrastructure without intermediaries, which has increased the transparency, accessibility, and efficiency of financial transactions. M. Pisaniuc *et al.* (2024) analysed the development of FinTech, InsurTech, and RegTech as key components of the digital transformation of the financial sector, with a focus on their business models and technological underpinnings. The researchers stressed that the introduction of innovative financial technologies contributes to improving the efficiency of banking systems, developing financial services and strengthening the global competitiveness of financial markets. Despite a significant amount of research devoted to the digital transformation of financial systems and the development of sustainable finance, the issue of integrating artificial intelligence tools into the public management system of financial markets remained insufficiently studied. The purpose of the study was a comprehensive analysis of public administration strategies aimed at stimulating the sustainable development of finance through digital transformation, and an assessment of the legal aspects of the use of intelligent systems in state financial supervision. Research objectives: 1) to analyse current trends in digital transformation of public financial management and the role of AI in ensuring financial stability; 2) to identify the main legal challenges that have arisen during the integration of intelligent systems into regulatory practice; 3) to develop recommendations for legal support of the use of digital technologies in public financial management considering international practices.

Materials and Methods

The study was based on an interdisciplinary approach that combined the analysis of digital technologies in public financial management and the assessment of the legal aspects of the application of intelligent systems. To ensure the complexity and reliability of the results, mixed methods research was used, which included both quantitative and qualitative research methods. Key components of the methodology included content analysis of scientific sources and regulations governing the use of artificial intelligence in the financial sector. In particular, data from the European

Commission (2025) was analysed, which indicates the EU requirement for large companies to disclose information on sustainable development, including Environmental, Social, and Governance aspects, to increase transparency and ensure comparability of reporting; EFRAG (n.d.), which considered specific areas of ESRS development, in particular, sectoral standards, standards for SMEs, digital taxonomy; European Securities and Markets Authority (n.d.), who coordinated supervision at the national level of companies' reporting on sustainable development, participated in the development of ESRS standards, and monitored the development of IFRS Sustainability Disclosure standards. Regulation (EU) No. 2024/1689 (2024), Council of Europe (n.d.) and Commodity Futures Trading Commission (n.d.) were also considered.

The study analysed and compared the international experience of implementing intelligent systems in government agencies, in particular, in the EU, USA, and Singapore. An expert survey was conducted to supplement the results of the analysis of scientific sources and obtain practical assessments on the introduction of digital technologies in the field of financial regulation. The research method involved conducting unstructured interviews with RegTech specialists who had experience working in financial regulators, FinTech companies, and international consulting organisations. The study involved 10 experts from different countries representing the professional environment of the European Union, North America, and Asia. The sample was formed on the principle of targeted sampling, which allowed including specialists with practical experience in the field of digital financial regulation, the use of artificial intelligence technologies in financial monitoring, and the development of RegTech solutions. The respondents included representatives from regulatory bodies, FinTech companies, RegTech start-ups, and consultancy firms operating in the field of digital financial regulation. The profile of the experts is presented in Table 1.

Table 1. *Expert profile*

No.	Country	Sector	Professional specialisation	Work experience
1	Germany	Financial regulator	Digital financial supervision	12 years
2	Singapore	RegTech-company	Development of SupTech platforms	10 years
3	USA	FinTech company	AI-financial risk analytics	11 years
4	United Kingdom	Consulting	Regulatory technologies	14 years
5	Canada	Financial sector	Compliance and financial monitoring	9 years
6	Netherlands	RegTech-startup	Algorithmic control systems	8 years
7	France	Public sector	Digital financial regulation	13 years
8	Estonia	GovTech	Digital governance	10 years
9	Australia	Fintech industry	Risk management	12 years
10	Switzerland	International consulting	Regulatory policy	15 years

Source: *compiled by authors*

Interviews were conducted in the format of open conversations, which allowed experts to freely express their own assessments of current trends in the digital transformation of financial regulation. The main thematic blocks of the interview covered the following issues: 1) the role of artificial intelligence technologies in the modernisation of financial supervision; 2) the possibilities of using RegTech and SupTech tools to improve the effectiveness of state control; 3) key legal risks of using algorithmic systems in financial regulation; 4) prospects for the development of sustainable finance in the context of digitalisation of financial markets. The results of the interview were analysed using the method of thematic analysis, which allowed identifying the main conceptual categories and repeated semantic patterns in the respondents' answers. Based on an integrated approach, the research provided: integration of theoretical and practical aspects of digital transformation; assessment of potential legal risks and challenges; development of scientifically based recommendations for optimising public financial management.

Results and Discussion

In the current conditions of globalisation, digitalisation, and high volatility of financial markets, the issues of sustainable development of the financial system have come to the forefront of academic, practical, and political discourses. The financial system was not only a mechanism for redistributing resources, but also an indicator of economic stability, social well-being, and the state's ability to withstand internal and external shocks. With this in mind, public financial management required not only conventional regulatory approaches, but also advanced tools that can ensure transparency, efficiency, and predictability of management decision-making. The use of digital technologies in the field of state regulation of finance has become particularly relevant in the context of expectations for the creation of adaptive, intelligent surveillance systems. Systems of AI, machine learning and Big Data processing (Big Data) have opened up new prospects for improving the efficiency of state supervision, automating analytical functions, and optimising procedures for monitoring financial activities.

In a number of developed countries, including the European Union, the United States, and Singapore, government regulators have already implemented elements of "RegTech" and "SupTech" – technologies for regulatory and supervisory functions based on algorithmic data analysis and predictive models. For example, European

Central Bank (n.d.) and the Financial Conduct Authority (n.d.) used algorithmic systems to detect anomalies in financial flows, which helped to strengthen the fight against financial crimes and improve the quality of risk assessment. In the USA, U.S. Securities and Exchange Commission (n.d.) used machine learning to integrate data from multiple sources to better monitor capital markets. Singapore's regulatory pilot testing platforms have supported FinTech innovation through close collaboration between government agencies and the private sector, including the use of AI to assess credit risks and market behaviour patterns (Luo *et al.*, 2025). The digital transformation of public financial management was accompanied not only by technical, but also by fundamental legal challenges. State regulators are faced with the need to build a legal environment that will ensure: 1) clear mechanisms of responsibility for automated solutions; 2) balance between the openness of algorithms and the protection of commercial and personal information; 3) compliance of national legislation with international standards in the field of data processing, cybersecurity and AI ethics; 4) adaptation of legal tools to regulate the impact of algorithmic models on competitive processes (Singh *et al.*, 2025).

Insufficient attention to the legal dimension of digital transformation can lead to legal uncertainty, undermine the confidence of financial market participants, and create risks to national financial security. That is why scientific interest has shifted from narrowly technical discussions to interdisciplinary research that combines technological, economic, and legal aspects of public administration. J.C. Crisanto *et al.* (2024) noted that the effective use of AI in public financial management is possible only if technological capabilities interact with regulatory and legal guarantees. The advantages of digital technologies in government regulation of finance – such as improving the accuracy of forecasts, automating routine processes, and early detection of risks – must be balanced with the requirements of legal certainty, ethics, and transparency of algorithms. The analysis of the survey experts' responses showed that the majority of respondents considered the digital transformation of financial regulation as one of the key factors for improving the effectiveness of state supervision of financial markets. According to the interviewed experts, the use of artificial intelligence tools has significantly expanded the capabilities of financial regulators to process large amounts of data, identify financial risks and automate control procedures. Experts noted the existence of a number of significant challenges associated with the use of algorithmic systems in financial regulation. The main problems identified were issues of transparency of algorithms, the possibility of system errors in the processes of automated data analysis, and the complexity of determining legal liability in cases where decisions are made with the participation of artificial intelligence systems. In addition, respondents stressed the importance of developing international cooperation in the field of RegTech regulation. According to their estimates, the effective implementation of intelligent systems in financial supervision required harmonisation of regulatory approaches at the international level, which will ensure the compatibility of digital financial infrastructure and increase the level of trust in digital financial technologies. A summary of the results of the expert survey is presented in Table 2.

Table 2. *Summarising the results of an expert survey*

Evaluation area	Main opinions of experts
Use of AI in financial supervision	Improvement of the efficiency of data analysis, quick identification of risks
RegTech and SupTech	Automation of regulatory processes, reduction of administrative burden
Main legal challenges	Transparency of algorithms, responsibility for automated solutions
Development prospects	Integration of digital technologies with the sustainable finance system
International cooperation	Need to harmonise regulatory approaches

Source: *compiled by authors*

Convergence of sustainable finance, digital technology, governance, and law has stimulated a new paradigm, often referred to as "sustainable digital finance" or "green fintech", which aims to align financial systems with the 2030 Sustainable Development Goals (SDG) (Global Compact Network Ukraine, n.d.). In 2024-2026, this area moved from voluntary ESG initiatives to mandatory, proven and technologically supported reporting, with a major focus on mitigating "greenwashing" through a robust digital legal framework. Table 3 summarises the main characteristics of this convergent landscape. Thus, digital tools and innovative technologies, in particular artificial intelligence, blockchain, and the Internet of Things, are actively used to increase transparency and responsibility in the field of sustainable financing, contributing to the fight against "greenwashing". S. Kumar *et al.* (2022) identified seven major research themes for sustainable finance, namely: socially responsible investment, climate finance, green finance, impact investment, carbon finance, energy finance, and sustainable finance and investment management. The researchers also suggested that more work is needed to promote sustainable finance, such as developing innovative sustainable finance tools, managing the returns and returns of sustainable investments, improving the sustainability of sustainable finance, developing policies and frameworks for sustainable finance, and combating "greenwashing" in sustainable finance by enterprises. P.J. Morgan (2022) called for caution in the use of digital sustainable finance products. The researcher noted that while digital financial technologies or FinTech can

promote green finance, they also create new risks and unintended consequences for the environment and users due to digital technology vulnerabilities such as identity theft and cybersecurity risks.

Table 3. *Converged landscape of sustainable finance, digital technology, governance, and law*

Sustainable finance and digital convergence
Technologies such as artificial intelligence, blockchain, and the Internet of Things have been used to improve ESG tracking, reporting, and accountability by mitigating "greenwashing" by providing tracked data
Green fintechnology and Finance 5.0: Finance 5.0 has gone beyond automation (Finance 4.0) to human-centred, ethical artificial intelligence in finance, seeking to strengthen financial inclusion and align capital with ESG goals
Ways to influence: digital finance has been used to improve access to capital for small and medium-sized enterprises, provide green financing related to digital currency, and support carbon credit trading
Development of public administration and regulation (2024-2026)
Mandatory standards: the European Union has become a leader in implementing the Corporate Sustainability Reporting Directive (CSRD), which obliges more than 50,000 companies to report in accordance with the European Sustainable Development Reporting Standards (ESRS), starting in 2025/2026, often with eXtensible Business Reporting Language (XBRL)
The stricter ESMA guidelines, which came into force in 2024/2025, required funds with ESG names to have at least 80% of their assets focused on Sustainable Development Goals, which prevents "greenwashing" in financial products.
ESG rating oversight: new EU regulations (2025) require ESG rating providers to be authorised and supervised by the ESMA, ensuring methodological transparency
Global harmonisation (ISSB): the International Sustainability Standards Board (ISSB) has issued IFRS S1 and S2 to establish a global baseline for climate-related disclosure, in line with regional regulations such as the EU CSRD.
Legal and institutional framework
Anti-corruption and transparency: anti-money laundering (AML) and anti-corruption laws are increasingly integrated with ESG governance requirements, linking financial integrity to sustainability
Artificial intelligence and data ethics: legal frameworks have evolved to address algorithmic bias and data discrimination, and new standards have been aimed at ensuring that financial decisions made based on artificial intelligence are accountable and respect for human rights
Digital identity and privacy: data protection modernisation (Convention 108 +) has become essential for digital governance, ensuring the secure and appropriate use of data in financial technologies
"Stop counting" and regulatory flexibility: to manage the "burden" of new reporting, the EU has adopted temporary "stop counting" directives to facilitate the transition for companies (2025)
Key challenges and future directions
Regulatory fragmentation: despite ISSB's work, various regional sustainability taxonomies (EU, US, and Asia) have continued to complicate global compliance
"Double transition": legal and financial structures should consider the interaction of digital transformation and sustainability, since the energy consumption of digital technologies (for example, blockchain) may run counter to "green" goals
Nature-related risks: the financial framework has expanded beyond carbon emissions to cover biodiversity and nature dependencies under the leadership of the Taskforce on Nature-related Financial Disclosures (TNFD)
Key trends for 2026
Mandatory digital marking of all ESG data
Implementation of the EU "stop the countdown" directives and completion of the development of reporting standards for voluntary reporting of VSME
Expansion of AI audit requirements in the financial decision-making process

Source*: Regulation (EU) No. 2024/1689 (2024), T. Gulati et al. (2025), European Commission (2025), EFRAG (n.d.), Council of Europe (n.d.), Commodity Futures Trading Commission (n.d.)*

P.K. Ozili (2025) noted that many digital finance and FinTech investors have become conventional investors, meaning they have focused on the short-term financial performance of the financial technology companies they have invested in. Investors sought high returns, low risk, and focused on short-term financial performance rather than non-financial performance (Janicka *et al.*, 2021). A significant number of these investors were not interested in investing in sustainability-focused digital finance innovations that became long-term and offered low returns, high risk, and relied on non-financial performance. A small number of investors interested in sustainable digital finance innovations may not be enough to scale supply-side sustainable digital finance initiatives. This situation is further compounded by the fact that the number of investors who are not focused on sustainability is significantly higher than the number of investors who are focused on it. The Global Sustainable Investment Alliance (n.d.) showed that aggregate investments in sustainable development from the United States, Canada, Japan, Australia, and Europe accounted for only 35.9% of total assets under management at the beginning of 2020, meaning that the remaining 64.1% of investments were directed to assets that were not focused on sustainable development. Moreover, investment in sustainable development increased by only 20% in 2022 compared to 2020. However, the organisation has tried to persuade a large number of investors in digital financial instruments to shift their focus from short-term financial results to long-term non-financial indicators and to investments that consider social and environmental impact (Impact Investing). These efforts can positively change investors' attitudes towards Impact

Investing focused on sustainability, although this change will not happen immediately. Many digital financial service providers were reluctant to include sustainability principles in their service offerings because they did not see a clear way in which implementing sustainability principles would increase their profitability or improve the efficiency of providing digital financial services. Digital financial service providers can include sustainability principles in their offerings if they believe that changes will be costly and may negatively affect the foundations of their business, even if they lead to the greater good of the planet and society. Here, the role of competent public administration is of particular importance. Public administration plays a crucial role in promoting sustainable digital finance by acting as a catalyst, creating a supportive framework, and providing regulatory oversight to ensure that digital financial instruments (such as artificial intelligence, blockchain, and big data) are aligned with Environmental, Social, and Governance (ESG) goals. Governments have transformed digital finance into sustainable digital finance by integrating ESG principles into digital financial services, promoting financial inclusion, and leveraging technology to achieve zero-emission goals. The key roles of public administration in digital sustainable finance, and the key results of active management, are presented in Table 4.

Table 4. *Impact of public administration on sustainable financial development*

Key roles of public administration
Regulatory framework: develop and enforce ESG-compliant digital finance standards, including data standardisation, enhanced cybersecurity, consumer protection, and reduction of "greenwashing" risk
Incentive mechanisms: offering tax breaks, subsidies, or grants to companies and financial institutions that have implemented sustainable experiences, such as investing in green technologies or promoting financial inclusion
Infrastructure and data initiatives: investing in digital and physical infrastructure (e.g. mobile banking, data exchange platforms) that supports sustainable financial development, especially in underserved regions. This included creating affordable, high-quality ESG datasets to increase transparency
Integrating sustainable development into public services: applying digital technologies (mobile payments, Smart City applications) as tools to encourage consumer behaviour to engage in low-carbon activities, such as using reward systems for public transport or recycling
Promoting financial inclusion: using digital financial services to reduce transaction costs and improve access to finance for marginalised groups, in line with social development goals
Ensuring ethical AI and data protection: implementing management structures focused on digital transformation quality, data privacy, and mitigating algorithmic bias in AI financial applications
Key results of active management
Increasing green investment: the development of digital finance, supported by government green subsidies and environmental regulation, significantly reduces carbon emissions in manufacturing companies
Increased transparency: digital dashboards and blockchain-based auditing have improved tracking of sustainable investments and prevented "greenwashing"
Digital sustainability of SMEs: government-supported platforms gave SMEs access to digital marketing and financial instruments that they would not otherwise have

Source: *based on A.M. Elhady & S. Shohieb (2025)*

Therefore, active management in the field of digital finance includes the development of ESG standards, encouraging sustainable investment through financial instruments, implementing infrastructure initiatives to increase transparency and financial inclusion, and ensuring the ethical use of digital technologies, which helps to reduce emissions and supports the sustainability of small and medium-sized businesses. Y. Coskun & I. Unalmis (2022) argued that new research on sustainable finance has shown that improvements in digital finance have a limited positive impact on the green finance agenda. This discrepancy has raised concerns about their sustainability preferences and led to reflection on the role of policy development in improving the structure of green digital finance. The researchers examined the role of public policy in developing a more efficient system of green digital finance based on the goals of the Paris Climate Agreement and the Sustainable Development Goals (United Nations, n.d.). In addition, researchers noted that digital finance initiatives can be aimed at green digital finance in a well-designed ecosystem. In particular, governments can support green digital finance by implementing sound regulatory policies, and creating incentives through green data initiatives, tax cuts, and investment in technology infrastructure. I. Mavlutova *et al.* (2025) concluded that policymakers need to strike a balance between regulation, oversight, and administrative burden to maximise the potential of digital financial technology and ensure that digital technology maximises the contribution to sustainable economic development. As shown in Figure 1, the use of digital tools was crucial to achieving the sustainable development goals. Green digital finance was seen as a multidimensional concept that covered the full range of financial mediation solutions, targeted risk management implementation, and related regulatory functions that created a positive impact on the environment. Digitalisation opportunities have been integrated into green digital financial services chains and driven sustainable growth, contributing to the achievement of the UN Sustainable Development Goals (Mpofu & Mpofu, 2024).

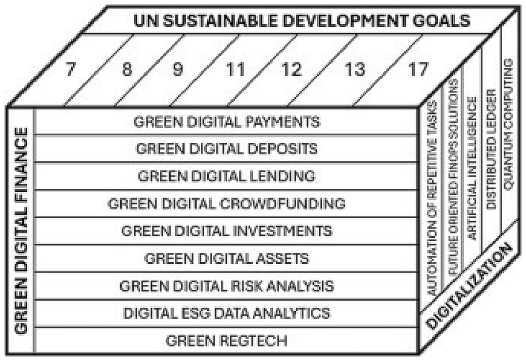

Figure 1. *Progress towards green digital finance at the intersection of digitalisation and Sustainable Development Goals*
Source: *based on P. Tamasiga et al. (2022), I. Mavlutova et al. (2025)*

Green financial technologies, by integrating green financial services into production and service delivery chains, could become an effective tool for achieving the following Sustainable Development Goals: affordable and clean energy, decent work and economic growth, industry, innovation and infrastructure, sustainable cities and communities, responsible consumption and production, climate action, and partnerships for the UN SDG. Critical areas for the development of green FinTech were new blockchain applications in all areas of environmental sustainability with the support of regulators and governments, and socially and environmentally responsible policies that encouraged the development of green financial products (Wasan *et al.*, 2021). "Green" FinTech projects can become a powerful tool for developing "green" financing, which has become part of sustainable financing. However, there was a gap in research, as "green" funding and "green" FinTech projects were not sufficiently studied (Puschmann & Quattrocchi, 2023).

Government support has been essential to encourage the development of green digital finance, especially through the introduction of incentives in the form of tax cuts and investment projects in technology infrastructure, and that funding regulation has contributed to the improvement of renewable energy use (Cheng *et al.*, 2023). Legal aspects and related challenges have become a critical area of the public management landscape for sustainable finance development. Artificial intelligence has transformed the regulation of financial markets by improving monitoring, reporting, and compliance with sustainable finance standards (ESG), moving from manual, sporadic inspections to real-time automated surveillance. Given that, according to van Maarseveen's projections (2025), sustainable investment assets are set to reach USD 50 trillion by the end of 2026, AI has been crucial in combating "greenwashing", managing financial risks associated with climate change, and processing vast unstructured datasets on sustainable development. Table 5 summarises the role of AI in regulating and complying with sustainable finance requirements, and key regulatory approaches and challenges.

Table 5. *Artificial intelligence-based regulation in sustainable finance*

AI in the field of regulation and compliance with sustainable finance requirements
ESG data processing and standardisation: AI, in particular natural language processing (NLP), analysed unstructured data – corporate reports, news, and social media data – to verify sustainability claims and fill in gaps in missing corporate data (e.g., greenhouse gas emissions)
"Greenwashing" detection: AI tools such as ASKCLIMATE and ASKNATURE at the University of Zurich have enabled independent verification of ESG corporate reports, identifying inconsistencies between stated commitments and actual practices
Real-time risk monitoring: AI combined geospatial data (satellite imagery) with corporate reports to track environmental impacts (deforestation, pollution) at the asset level, enabling regulators to identify risks faster than conventional report-based methods
Regulatory reporting automation: generative AI has increasingly been used to automate sustainability reporting (e.g. CSRD, SFDR) in the EU, reducing high labour costs and improving consistency
Key regulatory approaches
EU (proactive and strict law): Regulation (EU) No. 2024/1689 (2024) classified AI systems designed to assess creditworthiness, often considering ESG factors, as high-risk, requiring strict transparency and human control
UK (step-by-step and risk-based): UK regulators (FCA, PRA) have used the rules to address AI risk issues, focusing on operational sustainability and the use of AI-based tools to analyse surveillance data
US (innovation-oriented): regulatory approaches are less directive, they focus on executive orders that emphasise fairness and non-discrimination, rather than strict industry-specific AI laws
Challenges and risks of AI-based regulation
Black box dilemma: complex AI models, especially deep learning, can make it difficult for regulators to understand the rationale behind automated decisions, undermining accountability
Data quality and bias: the effectiveness of AI depended on the quality of training data; inconsistent or inaccurate ESG data can lead to false positives (false detection of "greenwashing") or false negative results
Model grouping: reliance on similar third-party AI models in multiple companies can create systemic risks and sudden crashes
Regulatory fragmentation: different regional approaches to AI regulation have created compliance challenges for global financial institutions

Source: *based on M. Florez (2025)*

To ensure effective regulation, the authorities switched to systems involving humans, requiring 30% of human control when making final decisions, while artificial intelligence automated 70% of repetitive data processing.

However, along with technological advantages, there were also legal problems: responsibility for decisions made by algorithms; opacity of artificial intelligence models; risks of data privacy violations; the need for new regulatory mechanisms. Therefore, the digitalisation of financial management required a combination of technological solutions with appropriate legal regulation. Integration of intelligent systems into the system of state financial regulation required a comprehensive analysis of the legal aspects of their use. The development of digital technologies in the field of finance has created new challenges for the legal system, since conventional regulatory mechanisms have not always considered the specifics of the functioning of algorithmic systems. In particular, the definition of responsibility for decisions made with the participation of artificial intelligence systems, ensuring transparency of algorithmic models, and creating effective mechanisms for controlling the use of digital technologies in public administration processes remained important issues. In addition, the use of intelligent systems in the financial sector required proper legal regulation in the field of personal data protection, information security, and ensuring the cyber stability of the financial infrastructure.

In this context, an important component of the contemporary public administration policy was the development of a comprehensive regulatory framework that regulated the use of digital technologies in the financial sector. Such a framework should ensure transparency in the functioning of algorithmic systems, establish clear rules for their use in state financial supervision, and provide for effective mechanisms for liability for violations of established norms. Singapore has actively integrated artificial intelligence into financial market surveillance to deal with complex threats. Monetary Authority of Singapore (MAS) (n.d.) stimulated implementation by allocating SGD 100 million for financing, developing new AI risk management guidelines for 2025/2026, and focusing on AML and trade oversight. Key applications included AI fraud detection, behavioural anomaly detection, and RegTech compliance tools aimed at balancing innovation and robust security. Singapore has used joint regulation and recommendations (guidelines) to implement mandatory legislation. MAS emphasised that financial institutions should implement a robust management framework for AI, including risk management systems, internal audits, and human control. The existing framework actually included two "pillars": the FEAT principles (fairness, ethics, accountability, transparency) for AI in the financial sector, established in 2019, which remained the foundation of AI ethics (Monetary Authority of Singapore (MAS), n.d.); Personal Data Protection Act 2012 (2020) (Personal data protection act covered data security and privacy in AI systems). Singapore has been at the forefront of developing AI recommendations and collaboration to ensure compliance with AML regulations. Regulators in Singapore have taken a position to promote AI innovation, and it is one of the few markets where there have been guidelines for implementing AI for use under AML control.

W.O. Benaissa *et al.* (2025) saw the UK and Singapore as leaders in AI-based AML innovation, balancing regulatory oversight and technological progress. Both countries have set global standards by implementing flexible, scalable artificial intelligence systems that have improved compliance, reduced the risks of financial crime in fast-growing financial centres, and supported sustained growth in an emerging digital economy. From evolving AML typologies to ever-changing regulatory frameworks and constantly updated watch lists, the lesson from these innovative markets was the following: the key to successfully implementing AML measures was the regulator's collaboration and an approach that encouraged innovation. In the USA, in 2026, surveillance of the US financial market using artificial intelligence was regulated by a hybrid approach that combined existing regulations (SEC, CFTC) and new risk assessment frameworks. Key initiatives included the AI-related risk management framework adopted by U.S. Department of the Treasury (n.d.) in February 2026 and memorial for the Heads of Executive Departments and Agencies (2025), which prioritised responsible, proven and secure AI implementation. Proposed legislation, such as the financial artificial intelligence Risk Reduction Act, was intended to toughen penalties for AI fraud. Key legislative and regulatory changes (2025-2026) included the following: 1) Ministry of Finance and federal government guidelines: the Ministry of Finance has published the AI-related risk management framework (FS AI RMF) and a joint dictionary of AI terms, with a focus on AI cybersecurity and operational sustainability; 2) SEC oversight focus: the SEC has identified more than 30 AI use cases for 2024, focusing on identifying manipulative trading operations. Among the new regulatory proposals are the mandatory maintenance of audit traces for transactions that were carried out using AI, and the introduction of an "algorithmic penalty" for illegal actions (U.S. Department of the Treasury, n.d.); 3) CFTC requirements: CFTC rule 38.156 required automated trade surveillance systems to detect market manipulation, requiring AI to comply with existing trade practice rules; 4) proposed legislation: the financial artificial intelligence Risk Mitigation Act proposed stricter penalties for AI market manipulation and increased oversight of AI service providers by the NCUA and FHFA; 5) state-level actions: by early 2026, 38 states had passed or enacted AI-related risk-elimination legislation – all 50 states have taken appropriate measures, indicating a broad and fragmented regulatory framework (Cornell Law School, n.d.).

In the EU Regulation (EU) No. 2024/1689 (2024) provided for strict regulation of AI in finance based on risk assessment, focusing on transparency, risk management, and human control. Financial regulators have used AI to monitor market integrity, assess creditworthiness, and systemic risks, requiring compliance with data management, tracking, and robust security measures. The AI law supplemented EU financial services laws (such as CRD, GDPR), rather than replacing them, requiring AI providers to

implement quality management systems and technical documentation. In general, AI-based regulatory technologies (RegTech) have used machine learning, natural language processing (NLP), and automation to optimise compliance, reducing costs by 30-50% while improving the accuracy of risk management, KYC, and AML monitoring. These systems have helped to detect anomalies in real time and automate reporting to effectively respond to complex changes in legislation. The rationale for AI problems and issues is presented in Table 6.

Table 6. *Applications and problems of AI in regulated technologies*

Key applications of AI in RegTech
AML and fraud detection: algorithms analysed large amounts of transaction data to identify suspicious patterns, reducing the number of false positive results
"Know Your Customer" verification (KYC): RPA and artificial intelligence have automated the adaptation process by instantly scanning and verifying documents
Regulatory reporting and monitoring: NLP tools have read and interpreted new regulations, allowing companies to quickly adapt their policies
Risk assessment: AI provided real-time multivariate analysis to identify potential risks
Benefits and impact
Cost reduction: automating routine tasks reduced labour costs ensuring compliance with regulatory requirements
Efficiency: faster decision-making, with some companies reducing fraud verification time by 30%
Scalability: AI systems have easily scaled along with business growth, enabling automated and consistent surveillance
Challenges and trends
Data privacy and security: processing confidential information required strong protection
Model transparency: explaining AI solutions was crucial for regulatory audits
Integration: combining new AI tools with old banking systems created technical obstacles
New trend: growing adoption of agent-based AI for autonomous compliance, where AI agents automatically detect and fix regulatory compliance issues

Source: *based on M. Florez (2025)*

The general trend of using artificial intelligence in the field of RegTech is important from statistical data. The global AI market in RegTech is expected to reach approximately USD 29.6 billion by 2033, compared to USD 1.3 billion in 2023, growing at a compound annual growth rate (CAGR) of 36.7% over the forecast period from 2024 to 2033 (Fig. 2). Key drivers of this market's growth were the need for risk management solutions and increasing pressure from global regulatory requirements. As AI technologies improved, they offered more accurate analytics and stronger predictive capabilities, making them indispensable for companies that sought to remain leaders in regulatory compliance. This market trend is expected to continue, and AI will play a key role in transforming the way companies manage regulatory compliance issues and address regulatory issues.

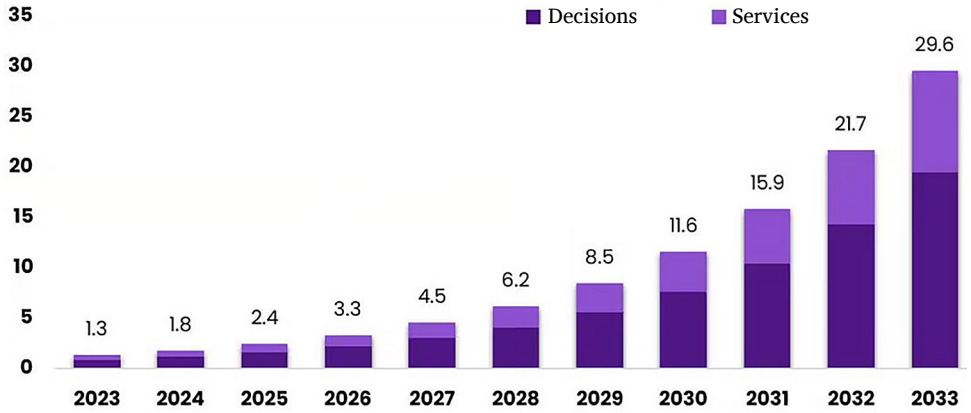

Figure 2. *Global artificial intelligence market in RegTech, billion USD*

Source: *Market.us (2024)*

AI-based solutions, such as compliance software, risk management systems, and audit systems, were in high demand because they provided comprehensive and seamless management of regulatory processes. Implementing these solutions has allowed businesses to adapt faster to regulatory changes, while ensuring accuracy and reducing the likelihood of non-compliance penalties. In addition, artificial intelligence solutions in the RegTech sector have proven effective in analysing large amounts of data to identify potential risks and regulatory compliance issues before they escalate. This proactive approach to risk management has been crucial for sectors such as banking, financial

services, and healthcare, where regulatory requirements have become stringent and the cost of non-compliance can increase. The integration of artificial intelligence into these solutions has enabled continuous learning and improvement, increasing their effectiveness and making them the best choice for many organisations.

In 2023, North America dominated the artificial intelligence market in RegTech, gaining more than 36.7% of the share (Global AI in RegTech Market By Type, 2024). This dominance was conditioned by the high concentration of financial institutions and developed technological infrastructure in the region, especially in the United States and Canada. These countries have become leaders in introducing new technologies, including artificial intelligence, to improve regulatory processes and manage regulatory compliance. The presence of large technology companies and startups focused on AI-based solutions to meet regulatory requirements further contributes to this trend. Moreover, North America's tight regulatory environment required robust compliance solutions, which stimulated demand for RegTech's AI-based services. Regulators in the United States, such as the U.S. Securities and Exchange Commission (n.d.) and the Federal Reserve Board (n.d.), constantly updated regulations to address new financial risks and complexities, which required flexible and effective compliance tools offered by artificial intelligence technologies. In addition, the region's openness to cloud solutions has increased the integration of artificial intelligence into RegTech, making compliance processes more adaptive and less resource-intensive. This technologically advanced approach, combined with significant investment in artificial intelligence research and development from the private and public sectors, has ensured that North America remains at the forefront of the global artificial intelligence market at RegTech.

Thus, the integration of AI into RegTech offered advantages and opportunities. Firstly, AI can help automate compliance tasks, such as monitoring and analysing large amounts of financial data to identify potential risks and breaches. Using machine learning algorithms, artificial intelligence systems can learn from historical data and identify patterns and anomalies that indicate potential regulatory violations. This automation has reduced reliance on manual processes, improved accuracy, and provided real-time analytics, enabling organisations to proactively address compliance issues. The artificial intelligence market in RegTech has also created challenges and considerations. One of the main issues was data privacy and security. RegTech systems depended on access to sensitive and sensitive data, including customer information and financial records. Ensuring reliable data protection measures and compliance with regulations such as the General Data Protection Regulation (EU GDPR) (2018) was critical to maintaining trust and protecting against potential breaches. Interpreting and explaining artificial intelligence-based decision-making processes has become another challenge. Regulators and auditors needed transparency and clarity in artificial intelligence systems to accurately assess compliance. The development of clear models and structures of artificial intelligence that can provide insight into the decision-making process has become important for solving this problem. Moreover, the introduction of artificial intelligence in RegTech required qualified specialists with both regulatory and technical expertise.

The regulation of sustainable funding through AI-based solutions included the use of machine learning, natural language processing, and big data analytics to automate ESG compliance, improve risk assessment, and prevent "greenwashing". Since significant growth in sustainable investment assets is projected for the 2030s, artificial intelligence is a key tool for scaling and verifying these investments by processing massive, unstructured data sets into practical, transparent and relevant findings. Artificial intelligence platforms such as those developed by MSCI and Clarity AI have used machine learning to identify inconsistencies, exaggerated statements, and misleading wording in corporate sustainability reports, increasing accuracy by up to 85% (Abikoye *et al.*, 2024). Artificial intelligence-based solutions, such as those used by P.J. Morgan (2022), optimised reporting by reducing compliance costs by 70-85% by automating data collection and verification, thereby addressing the complexity of regulations such as SFDR and CSDR. Artificial intelligence and blockchain technology have been combined to track the use of funds from green bonds to ensure their use for environmental purposes, reducing the risk of misuse of funds. Conflicting or inaccurate ESG data can lead to suboptimal AI-based decisions. The complexity of some AI models has made it difficult for regulators to understand how decisions are made, raising concerns about transparency, bias, and accountability.

Conclusions

The results of the study showed that contemporary financial systems operated in an environment of high technological dynamics, which necessitated the transformation of conventional financial supervision mechanisms and development new public administration tools. The introduction of digital technologies, in particular artificial intelligence tools, significantly increased the efficiency of state financial control, contributed to the automation of analytical processes and provided more accurate forecasting of financial market risks. Digitalisation of the financial sector was accompanied by the emergence of new legal challenges. Key issues included ensuring transparency of algorithmic solutions, determining responsibility for the use of artificial intelligence systems in public administration processes, and adapting the regulatory framework to the rapid development of digital technologies. An important aspect was the need to develop effective mechanisms for controlling the use of intelligent systems in financial regulation and ensuring a balance between stimulating innovation and maintaining financial stability.

Integration of digital technologies into the public financial management system can contribute to the

development of sustainable financial instruments, increase the investment attractiveness of the economy, and strengthen the financial security of the state. The effectiveness of such processes largely depends on the creation of a comprehensive legal system that ensures transparency, accountability, and security of the use of digital technologies in the financial sector. In the EU, artificial intelligence systems designed to assess creditworthiness were classified as high-risk, which required high transparency and human control. In the UK, regulators have focused on a risk-based approach, with a focus on operational sustainability and the use of AI to analyse observational data. In the US, regulatory approaches have focused on ensuring fairness and non-discrimination through executive orders, without strict industry laws on AI. The study had limitations, in particular, the analysis was based mainly on theoretical approaches and generalisation of international experience, which may require further empirical verification. The rapid development of digital technologies in the financial sector has made it necessary to constantly update regulatory and institutional approaches to regulation. The prospects for further research are related to the development of models of digital management of sustainable finances, assessment of the effectiveness of the use of artificial intelligence in the financial supervision system, and the development of new international standards for the legal regulation of algorithmic financial systems.

Acknowledgements

None.

Funding

None.

Conflict of Interest

None.

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Публічне управління сталим розвитком фінансів: цифрова трансформація та правові виклики

Сергій Петруха
Кандидат економічних наук, доцент
Західноукраїнський національний університет
46009, вул. Львівська, 11, м. Тернопіль, Україна
https://orcid.org/0000-0002-8859-0724

Ніна Петруха
Кандидат економічних наук, доцент
Київський національний університет будівництва і архітектури
03037, просп. Повітряних Сил України, 31, м. Київ, Україна
https://orcid.org/0000-0002-3805-2215

Ганна Ортіна
Доктор наук з державного управління, професор
Таврійський державний агротехнологічний університет імені Дмитра Моторного
69063, вул. Університетська, 66, м. Запоріжжя, Україна
https://orcid.org/0000-0003-0266-740X

Руслан Стужук
Аспірант
Поліський національний університет
10008, бульв. Старий, м. Житомир, Україна
https://orcid.org/0009-0007-7902-7714

Дмитро Плахотній
Аспірант
Національна академія управління
03051, вул. Ушинського, 15, м. Київ, Україна
https://orcid.org/0009-0000-1627-0310

Анотація. Метою дослідження став аналіз стратегій публічного управління, спрямованих на стимулювання інвестицій у сталу економіку, а також оцінка можливостей використання інструментів штучного інтелекту для підвищення ефективності державного нагляду за фінансовими ринками. У роботі було досліджено стратегії публічного управління, орієнтовані на стимулювання інвестицій у сталу економіку, а також правові аспекти впровадження інтелектуальних систем у процеси прийняття рішень, що сприяли забезпеченню фінансової безпеки та стабільності фінансової системи в довгостроковій перспективі. Зокрема, було приділено увагу питанням прозорості алгоритмічних рішень, відповідальності за використання автоматизованих систем і захисту фінансових та персональних даних у процесах державного фінансового управління. Результати дослідження показали, що інтеграція цифрових технологій у систему публічного управління фінансами дозволило значно підвищити ефективність фінансового нагляду, покращити прозорість операцій та розвивати сталий фінансовий інструментарій. Однак, успішна реалізація цих трансформацій вимагала удосконалення нормативно-правової бази та створення механізмів регулювання використання штучного інтелекту в фінансовому секторі. Крім того, було визначено, що штучний інтелект, завдяки своїй здатності автоматизувати аналіз великих даних та оперативно виявляти ризики, значно покращив ефективність фінансового регулювання. Проте, це створило правові виклики, зокрема щодо визначення відповідальності за автоматизовані рішення. Результати експертного опитування підтвердили важливість інтеграції цифрових технологій із правовими гарантіями, щоб забезпечити етичність і стабільність фінансових ринків. Практична значущість дослідження полягає у формуванні науково обґрунтованих підходів до інтеграції цифрових технологій у систему публічного управління фінансами з метою забезпечення фінансової стабільності, підвищення інвестиційної активності та підтримки довгострокового розвитку сталої економіки

Ключові слова: цифрове фінансове регулювання; регуляторні технології; рішення штучного інтелекту; стала економіка; фінансова безпека

DEMOCRATIC GOVERNANCE
Vol. 19, No. 1, 2026, 33-45
Journal homepage: https://d-governance.com.ua/
Received: 19.01.2026; Revised: 20.04.2026; Accepted: 28.05.2026; Published: 25.06.2026

UDC 332.1:334.7]:339.92(477+4-6ЄС)
DOI: 10.56318/dg/1.2026.33

E-ISSN 2070-4038

Cross-border innovation clusters as a tool for sustainable development of territorial communities: Management and legal aspects

Henriett Karolyi
Postgraduate Student
John von Neumann University
6000, 10 Izsáki út Str., Kecskemét, Hungary
https://orcid.org/0009-0006-1480-7245

Daria Ivashchenko*
PhD in International Law, Associate Professor
State University of Trade & Economics
02156, 19 Kyoto Str., Kyiv, Ukraine
https://orcid.org/0000-0003-4123-6821

Volodymyr Podibka
Postgraduate Student
Private Higher Education Establishment "European University"
03115, 16V Akademika Vernadskoho Blvd., Kyiv, Ukraine
https://orcid.org/0009-0009-5362-980X

Myroslav Zhdankevych
Postgraduate Student
V.I. Vernadsky Taurida National University
01103, 33 John McCain Str., Kyiv, Ukraine
https://orcid.org/0009-0007-8280-449X

Oleksandr Khotskyi
Postgraduate Student
Polissia National University
10002, 7 Staryi Blvd., Zhytomyr, Ukraine
https://orcid.org/0009-0000-2016-1168

Abstract. The relevance of the study is due to the need to find effective tools for ensuring sustainable development of territorial communities, in particular in the context of European integration and the growing role of cross-border cooperation. The aim of the article was to study the management and legal aspects of the formation and functioning of cross-border innovation clusters as a tool for stimulating regional development. The methodological basis was an interdisciplinary approach using comparative, institutional analysis and the case study method. As a result of the study, it was established that cross-border innovation clusters act as an effective mechanism for integrating economic, innovative and social resources of border territories, ensuring the formation of network interactions between business, science, and government. An analysis of European experience showed that the success is based on a combination of institutional support, a developed regulatory framework and the active participation of public administration bodies. The generalisation of practical cases made it possible to identify the key effects of cross-border projects, in particular economic, innovative, infrastructural, social and institutional. At the same time, it was established that in Ukraine the majority of cross-border cluster initiatives are of a project-based nature and are not transformed into stable institutional

Suggested Citation:
Karolyi, H., Ivashchenko, D., Podibka, V., Zhdankevych, M., & Khotskyi, O. (2026). Cross-border innovation clusters as a tool for sustainable development of territorial communities: Management and legal aspects. *Democratic Governance*, 19(1), 33-45. doi: 10.56318/dg/1.2026.33.

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**Corresponding author (d_ivashchenko@knute.edu.ua)*

structures, which limits the long-term impact. It was revealed that the main restraining factors are the fragmentation of legal regulation, insufficient coordination between institutions and limited financial resources. The need to develop effective management mechanisms, harmonisation of the regulatory framework and strengthening the participation of territorial communities in international cooperation programmes is substantiated. The practical value of the study lies in the possibility of using the obtained results to improve state regional policy and form effective models of management of cross-border cluster initiatives

Keywords: regional investment policy; cross-border cooperation; Euroregions; innovation ecosystems; legal regulation

Introduction

In the current conditions of globalisation, strengthening of international economic integration and transformation of the public administration system, the search for effective tools for ensuring sustainable development of territorial communities is of particular relevance. An important place among such tools is occupied by cross-border innovation clusters (CICs), which contribute to the activation of the economic potential of border territories, the development of innovative activity, the deepening of interregional cooperation and the formation of new models of economic interaction. Modern scientific research confirms that cluster approaches are an important factor in increasing the competitiveness of regions through the concentration of resources, the development of the innovation environment and the strengthening of institutional interaction (Ketels & Protsiv, 2021).

The main principle of international cross-border cooperation (CBC) is the establishment of relationships and the conclusion of contractual relations between border regions for the joint solution of urgent problems. In particular, the creation of Euroregions is carried out by concluding partnership agreements between local governments of neighbouring border territories. These agreements become the basis for the formation of associations of administrative-territorial units of both municipal and regional levels, which are interested in the joint implementation of various projects within a certain border zone. Ukraine has significant potential in the field of CBC, including the development of clusters as modern tools for introducing innovations into regional policy. At the same time, the implementation of this potential remains insufficiently effective. In this context, N. Danko & O. Izmailov (2025) focused on the feasibility of using cluster models of cross-border interaction as a tool for adapting the national economy to the conditions of European integration.

In modern Europe, CBC is considered one of the key mechanisms for reducing socio-economic disparities between regions, increasing the competitiveness of territories and stimulating innovative development. In particular, J.A.R. Borges *et al.* (2021) emphasised that in this context the cluster approach plays an important role, as it ensures effective interaction between public authorities, business, scientific institutions and the public sector, creating a favourable environment for generating and implementing innovations. At the same time, B. Derudder & X. Liu (2025) emphasised the importance of cross-border regional innovation systems as a new paradigm for the development of border territories, based on the integration of economic, institutional and technological processes.

The role of cross-border clusters in sustainable development is based on several key aspects: economic modernisation, scientific and applied development, sharing of infrastructure and knowledge, which reduces costs and increases production efficiency, and attracting investment. Such structures are a key tool for the structural transformation of regions, ensuring the long-term economic, social and environmental development. At the same time, as noted by V. Liashenko & N. Trushkina (2021), the effectiveness of the functioning of cross-border clusters is largely determined by institutional conditions, in particular the level of policy coordination, regulatory support and infrastructure development

The study of CICs acquires particular importance in the context of the implementation of Ukraine's European integration course. Deepening cooperation with European institutions, harmonisation of national legislation with European Union law and increased participation of Ukrainian regions in CBC programmes open up new opportunities for the development of border territories. In this context, territorial communities become important subjects of international interaction, capable of implementing joint innovation projects, attracting investments and forming competitive economic environments.

At the same time, modern transformations of territorial development are taking place under the influence of digitalisation and new security challenges, which necessitates the rethinking of public administration instruments. As noted by O. Sydorchuk *et al.* (2024), spatial development, in particular in the context of the formation of "smart" territories, is accompanied by the growth of complex threats that arise at the intersection of technological, social and economic processes, which requires integrated management solutions. In this context, cluster approaches are considered as an effective tool for coordinating economic activity and strengthening the institutional capacity of territorial communities, in particular in the cross-border dimension.

Meanwhile, the effectiveness of the functioning of CICs largely depends on proper management support, coordination of the activities of various institutional actors and the formation of an appropriate legal environment that regulates the mechanisms of cross-border interaction. Despite the growing scientific interest in the issues of cluster development and CBC, the issues of management mechanisms

and legal regulation of the functioning of CICs in the context of sustainable development of territorial communities remain insufficiently researched. The aim of the article was to study the management and legal aspects of the functioning of CICs as a tool for ensuring the sustainable development of territorial communities in the context of Ukraine's European integration.

Materials and Methods

The methodological basis of the study was an interdisciplinary approach that combined tools of public administration, regional economics and law, which allowed for a comprehensive analysis of the functioning of CICs in the context of ensuring the sustainable development of territorial communities. The object of the study was the processes of formation and functioning of CICs, and the subject was the management and legal mechanisms of the development in the context of the European integration of Ukraine. The empirical basis of the study was scientific publications on the issues of cluster development and CBC, legal and regulatory acts of the European Union and Ukraine, analytical reports of international organisations, as well as materials on the practical functioning of cross-border clusters in the EU countries and Ukraine. The use of diverse sources allowed for the comprehensiveness of the analysis and the implementation of the principle of methodological triangulation.

The study was carried out using a qualitative research strategy that included a combination of comparative analysis, institutional analysis and case studies. This approach was chosen due to the complexity of the research object, which simultaneously covered the management, economic and legal aspects of the functioning of cluster entities in a cross-border environment. Comparative analysis was used to compare models of functioning of cross-border clusters in the countries of the European Union and in Ukraine. The comparison was carried out according to the following criteria: institutional management structure, level of participation of public authorities, funding mechanisms, degree of integration into regional innovation systems, as well as the presence of regulatory and legal support. This made it possible to identify differences in approaches to organising cluster interaction and determine the factors of the effectiveness.

Institutional analysis was used to study the legal environment of functioning of CICs. Within the framework of this method, regulatory and legal acts of the European Union and Ukraine regulating CBC, cluster development and regional policy were analysed. Particular attention was paid to assessing the coherence of legal norms, the level of the implementation and the impact on the effectiveness of managing cluster initiatives.

The case study method was used for an in-depth analysis of the practices of cross-border clusters. The selection of cases was carried out on the principle of representativeness and theoretical relevance and included examples of clusters in the EU countries and Ukraine, demonstrating different models of organising cross-border interaction. The analysis of cases was carried out according to the following parameters: industry specialisation of the cluster, form of management, sources of funding, level of innovative activity, participation of public authorities, as well as the results of functioning from the point of view of economic and social effect. To generalise the results of the study, the methods of analysis, synthesis, systematisation and generalisation were used, which made it possible to form a holistic idea of the role of CICs in ensuring the sustainable development of territorial communities and to identify the key management and legal factors of the effective functioning.

The obtained results of the study directly reflect the application of the specified methods. In particular, the results of the comparative analysis of cross-border interaction models were systematised in the corresponding analytical generalisations, which made it possible to identify differences between the European and Ukrainian approaches. Institutional analysis was implemented through a study of the regulatory environment of cluster functioning, which was reflected in the conclusions regarding the role of legal regulation and public policy coordination. The case study method was reflected in the presented examples of cross-border cluster functioning, which made it possible to specify the influence of management mechanisms on the effectiveness. The generalisation of the research results was carried out by systematising the data obtained, which ensured the formation of a holistic vision of the role of CICs in ensuring the sustainable development of territorial communities.

Results and Discussion

Cross-border clusters in the system of sustainable development and regional policy of the EU

In modern conditions of globalisation, a special feature of the development of state regional and foreign economic policy is CBC, aimed at strengthening relations and creating conditions for closer coordination of actions in the field of integration of the economies of neighbouring countries. CBC in the most integrated form is implemented through the creation of cross-border clusters, which are an innovative element of cooperation that ensures the dynamic and sustainable development of cross-border regions. CICs contribute to sustainable development by connecting science, business, and public authorities across borders to accelerate the implementation of innovations. Such clusters contribute to economic growth, the development of local communities through job creation, technology transfer and infrastructure modernisation. Research in this area focuses on mechanisms for CBC, the formation of an environmentally sound economy, and increasing the competitiveness of regions through the sharing of infrastructure and knowledge, which ensures economic, environmental, and social sustainability (Derudder & Liu, 2025). The main aspects of research on CICs and sustainable development can be summarised in several key domains (Table 1).

Table 1. *Key aspects of research on CICs and sustainable development*

Research aspect	***Content***
Theoretical foundations	Studying the impact of cluster theory (e.g., Michael Porter) on sustainable development in a cross-border context
Management mechanisms	Analysis of tools that facilitate interaction between companies, educational institutions and government bodies of different countries
Greening of clusters	Research into the role of innovation in reducing the environmental footprint and transitioning to a green economy
Sustainability and risks	Assessing the sustainability of cross-border value chains vis-à-vis external economic and environmental partners
Development of local communities	Clusters help overcome the peripherality of border areas by strengthening the involvement of local actors (small and medium-sized enterprises, non-profit organisations, universities) in global value chains.
Key research areas	
Development of innovation infrastructure in border regions	
The relationship between sustainable development and cross-border projects	
Assessment of cluster effectiveness based on sustainability indicators (ESG – environmental, social, governance)	

Source: *compiled by the authors*

T. Makkonen & S. Rohde (2016) and A. D'ambrosio *et al.* (2017) expressed the authors' opinion that the phenomenon of cluster formation is associated with a paradigm shift, adaptation to the conditions of globalisation and a significant increase in the dynamism of the environment. In other words, the economy is moving into a new network order that combines the functional synthesis of hierarchical and market models. At the same time, the world economy and its components are stratified into cluster-network structures. These structures are much more flexible than traditional hierarchical models, and at the same time better integrated compared to classical market models. As a result, the modern economy is transformed into an extremely flexible network system with horizontal connections.

In this context, the development of multi-level partnerships between different groups of stakeholders, which ensure effective coordination of interaction within cluster systems, becomes important. As B. Singh & S. Chandra (2025) noted, the formation of sustainable partnerships between business, local communities, government institutions and other stakeholders contributes to the achievement of sustainable development goals, in particular by increasing the level of trust, inclusiveness and shared responsibility. In addition, such partnerships, including public-private and cross-sectoral cooperation, create the prerequisites for pooling resources, developing innovations and introducing modern technologies, which enhances the effectiveness of cluster-network structures (Zhao *et al.*, 2024). It was also argued that clusters will gradually become the main structural link in the global market space, performing the organising role that industries previously performed.

At the turn of the 1980s and 1990s, clusters were perceived as an advanced type of industrial agglomerations (hence the term "industrial clusters"), which allow participants and the territories where the participants are based to achieve special competitive advantages. Later, the factor of territorial localisation of clusters was added (hence the term "regional clusters"), as well as the description as network and non-hierarchical formations (Hardi *et al.*, 2021). Sociological studies of the 2000s attributed clusters to innovation ecosystems where collaboration mechanisms are formed (Liashenko & Trushkina, 2021). This gave rise to the concept of innovation clusters, whose participants develop a shared vision of future actions and the possibility of co-creation of values, relying on the mechanisms of production (co-production) and co-specialisation (co-specialisation) (Rácz, 2017).

CBC with the formation of cross-border clusters is widely represented in Europe. The EU pursues a targeted policy of cluster development by – creating and providing access to a database of clusters containing information on the number, geographical location and success stories; developing training platforms to provide member states and the regions with up-to-date information on key areas of cluster policy implementation; supporting pilot projects and activities aimed at developing effective tools for identifying and forming cluster initiatives.

Among the most effective tools for stimulating cluster development in the EU are:

1. The European Cluster Collaboration Platform (ECCP), n.d., functions as an information platform that provides a wide range of services. Among the main services, it is worth noting the cluster mapping, which provides access to up-to-date cluster maps in Europe and allows for comparative analysis of clusters by key competitiveness indicators. In addition, the observatory generates reports on cluster trends in Europe, focusing on internationalisation, global megatrends in industrial transformations, as well as identifying common interests and potential areas for cooperation.

2. The European Cluster Achievement Initiative aims to develop an indicative methodology for the creation and effective organisation of clusters, as well as to improve internal management processes. Currently, it is being implemented by the European Cluster Analysis Secretariat and the European Cluster Achievement Foundation. These organisations conduct specialised training and develop educational materials. In addition, this initiative serves as a funding programme for various projects.

3. The European Cluster Cooperation Platform provides companies with the opportunity to present the activities, share experience and find partners for cooperation both within the EU countries and beyond the borders. Within the framework of this platform, the concept of strategic cluster partnerships is implemented, the funding of which is provided through the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) programme (Regulation (EU) No. 1287/2013, 2013). Such partnerships are aimed at stimulating the joint work of clusters in Europe, the formation of a strategic vision and joint plans for integration into external markets. This allows strengthening the competitive position of small and medium-sized enterprises on a global scale.

4. The CluStrat (n.d.) project (Boosting innovation through new cluster concepts in support of emerging issues and cross-sectoral themes) focuses on supporting leading-edge industries and cross-sectoral cooperation. Within the framework of this initiative, 18 partners from Austria, the Czech Republic, Germany, Hungary, Italy, Poland, Slovakia, and Slovenia developed a joint strategy for the introduction of advanced technologies and the stimulation of new industries. The project includes proposals for joint actions at the transnational and macro-regional levels, the implementation of pilot initiatives, as well as detailed reports for each participating country of the consortium. These reports summarise best practices and key results of cluster activities.

5. The Vanguard Initiative (n.d.) aims to stimulate new growth through smart specialisation mechanisms. Its main goal is to transform regional partnerships and clusters, defined by strategic priorities of smart specialisation, into globally competitive associations. Regions participating in this initiative seek to promote the internationalisation of the cluster projects by developing cross-border and network connections and scaling the activities to strengthen the positions at the international level.

Although clusters in Europe develop independently, the state provides these clusters with significant financial and economic support. According to various sources, including C. Ketels & S. Protsiv (2021), about 30% of funding comes from national public funds, 25% are membership fees of participants in innovative industrial clusters, and 20% are funds from regional public funds. In general, in Europe, about 50% of funding sources are somehow related to the participation of state authorities at the national and regional levels. This plays an important, and in many cases, a key role in ensuring sustainable socio-economic development. Thus, the positive impact of innovative industrial clusters on the regional economy is ensured based on the formation of the brand of the industrial territory. As a result, this leads to an active growth of innovative activity of organisations of related industries, and inter-industry technological chains are formed.

Best practices and effects of the functioning of cross-border clusters in Europe

In the current conditions of European integration, the study of practical experience in the functioning of cross-border clusters as a tool for regional development is of particular importance. Analysis of successful cases enables identifying effective mechanisms of interaction between state institutions, business and scientific institutions within the cross-border space. This, in turn, creates a basis for generalising best practices and adapting these practices to the conditions of development of territorial communities.

The Medicon Valley cluster, which unites regions of Denmark and Sweden, began to take shape in the 1990s, and a significant impetus for its development is associated with the opening of the Øresund Bridge in 2000, which provided intensive integration of Copenhagen and Malmö (Cooke, 2004). The cluster specialises in life sciences, in particular research in the field of oncology, neurology and diabetes, and unites a wide network of companies, universities, hospitals, and research centres (Medicon Valley Alliance). The Scandinavian model of cluster development is characterised by a high level of interaction between the state, business and scientific institutions, which corresponds to the concept of the "knowledge triangle" and contributes to the innovative development of the region (OECD, 2011).

An example of a cross-border cluster initiative is the Bio-Based Industries Cluster (BIG-Cluster) (ECCP, 2025), which brings together cluster organisations from the Netherlands, Belgium, and Germany. The main goal of the cluster is to develop the bioeconomy by integrating the industrial, scientific and innovative resources of the cross-border region and forming competitive bio-based industries (BIG-Cluster). The cluster members implement joint projects aimed at introducing biorenewable materials, developing innovative technologies and supporting entrepreneurial initiatives in the bioeconomy. The cluster activities are also focused on strengthening cooperation between business, scientific institutions and the public sector, which is in line with modern approaches to the formation of cross-border innovation ecosystems.

Another example of a cross-border cluster is BioValley, located in the Upper Rhine region, which brings together participants from France, Germany, and Switzerland (BioValley Basel, n.d.). The cluster includes companies, research institutions, economic development bodies and other institutional structures cooperating in the field of biotechnology, pharmaceuticals and medical technologies. The developed innovation infrastructure, in particular science parks, technology platforms and knowledge transfer networks, contributes to the active exchange of information and the implementation of innovative solutions. The cluster demonstrates a high level of entrepreneurial activity, in particular through the support of start-ups and the development of innovation ecosystems, which is a characteristic feature of cross-border innovation systems in Europe.

Poland is one of the leading countries in Central Europe in the field of cluster policy, which is confirmed by its active participation in the formation of national and European cluster initiatives (Kowalski, 2020). A significant part of the clusters operate in border regions and are focused on international cooperation, which promotes integration into

the European economic space. Regional government bodies, scientific institutions and enterprises play an important role in the development of clusters, which corresponds to the model of interaction "business – science – government" (OECD, 2011). An example of effective cluster development is the Aviation Valley aviation cluster in the Podkarpacie Voivodeship, which unites over 160 aviation enterprises and actively cooperates with European partners (Aviation Valley Association). The cluster plays an important role in the development of high-tech production and helps attract investments to the region.

The benefits of CBC for local communities are clearly demonstrated within the framework of the Interreg South Baltic Programme, which is aimed at developing the economic, social and territorial cohesion of the region (Interreg South Baltic Programme, n.d.). In particular, the Umbrella project was focused on attracting new participants to CBC and provided for training events, development of management competencies and support for micro-initiatives aimed at strengthening interregional ties. The programme implemented a number of projects in the fields of tourism, ecology, innovation and transport integration, in particular Biking South Baltic, Interconnect, Live Lagoons and South Coast Baltic, which contribute to the development of infrastructure, innovative solutions and sustainable use of resources. As shown by the study of cross-border innovation systems conducted by T. Makkonen & S. Rohde (2016), such initiatives contribute to the formation of sustainable interregional ties, increasing institutional capacity and developing the innovative potential of territories. To systematise the results of the implementation of cross-border projects, it is advisable to distinguish the main types of effects of the impact on the development of territories (Table 2).

Table 2. *Types of effects of cross-border projects (using the example of the South Baltic programme)*

Effect type	Effect content	Implementation tools	Project examples
Economic	Growth of economic activity, development of small and medium-sized businesses, attraction of investments	Support for cluster initiatives, grant programmes, entrepreneurship development	SB Food INNO, Interconnect
Innovative	Development and implementation of new technologies, stimulation of scientific and practical cooperation	Joint R&D projects, technology transfer, development of innovation ecosystems	BioBIGG, FOCUS
Infrastructure	Development of transport, tourism and environmental infrastructure	Investments in infrastructure facilities, creation of joint routes and services	South Coast Baltic, Biking South Baltic
Environmental	Improving the environment, introducing resource-saving technologies	Environmental projects, natural resource management, monitoring	Live Lagoons
Social	Strengthening social cohesion, forming regional identity	Educational programmes, training activities, micro-projects ("people-to-people")	Umbrella, CaSYPoT
Institutional	Developing the capacity of authorities and organisations for cross-border interaction	Project management training, partnership building, policy coordination	Umbrella, DUNC
Cultural	Preservation and popularisation of cultural heritage, development of tourism	Joint cultural initiatives, branding of territories	BalticMuseums, DUNC

Source: *compiled by the authors*

The presented systematisation shows that cross-border projects have a complex impact on the development of territories, combining economic, innovative, social and institutional effects. The effectiveness is due to the integration of various public policy instruments and active interaction between actors from different countries, which ensures a synergistic result and strengthens the sustainable development of regions. An example of effective implementation is the Attractive Hardwoods project (2025), which brought together partners from Poland, Lithuania, and Sweden to develop ecotourism and jointly solve the problems of natural resource management. Within the framework of the project, a study of tourist flows was conducted, information materials were developed, and national development strategies were formed, which confirms the effectiveness of the cross-border approach to solving common challenges (Interreg South Baltic Programme, n.d.).

The BioBIGG (Bioeconomy Innovation for Growth in the South Baltic Area) project (n.d.) is based on the concept of efficient use of biological resources, a significant part of which is traditionally considered waste, although it has the potential for reuse within the bioeconomy. In particular, it concerns by-products of agricultural production, which can be involved in the creation of new types of products, which corresponds to the approach of "transforming waste into a resource" (Bioeconomy Strategy, n.d.). The BioBIGG project aims to identify such opportunities, reduce the environmental burden and support the development of small and medium-sized enterprises through the implementation of innovative solutions. The project involves cooperation between universities, enterprises and local governments, which contributes to the formation of innovation ecosystems and the development of cross-border connections. The project involves partners from Denmark, Poland, Sweden and Germany, in particular research institutions and organisations working in the field of renewable resources. An important element of the activity is the exchange of knowledge, conducting training activities and developing

the competences of participants, which makes it possible to increase the efficiency of the implementation of innovative solutions in the field of bioeconomy (BioBIGG, n.d.).

Summarising the above examples, it should be noted that cross-border clusters in Europe are an effective tool for integrating the economic, innovative and institutional resources of border areas. The development is based on a combination of a cluster approach, intersectoral interaction and support from supranational programmes, which ensures the formation of sustainable innovation ecosystems. An important characteristic of such clusters is the ability to generate synergistic effects, which are manifested in the growth of regional competitiveness, the activation of entrepreneurial activity and an increase in the level of socio-economic cohesion. Thus, cross-border cluster initiatives can be considered as a key tool for implementing the policy of sustainable development of territorial communities in the context of European integration.

Specifics and challenges of cross-border innovation cluster development in Ukraine

In Ukraine, CBC is considered in two key aspects: as a mechanism for the development of border regions and as a tool for implementing the country's European integration aspirations. At the same time, the development of CBC between border regions of Ukraine and neighbouring states is limited due to excessive ambition, political conditions and insufficient clarity of the functions of Euroregions. Although these regions declare the readiness to jointly solve urgent problems in various spheres of public life, the lack of a strategic approach makes it difficult to achieve results. Regional cooperation projects in Ukraine are most often implemented on the basis of accumulated practical experience, without the necessary theoretical and methodological foundation. This creates a critical need to develop scientifically sound frameworks that would optimise the processes of cooperation between border regions of Ukraine and EU countries. Such frameworks can become a driving force for innovative interaction, strengthening ties and knowledge exchange between regions, ensuring more effective use of existing opportunities. Issues arising in the field of CBC are related to the lack of activity of its participants in the implementation of relevant projects. The main reasons for this are the limited availability of sustainable sources of funding and the low quality of project management observed at the level of local executive authorities and self-government.

N. Reznikova *et al.* (2020) studied innovation clusters in the context of CBC. In the authors' work, the researchers identified different types of cluster formations that can be effectively adapted to implement cross-border interaction. This, in turn, made it possible to identify economic policy instruments aimed at stimulating the deepening of integration processes in regions located near the borders. As key criteria for distinguishing between the concepts of "innovation cluster in CBC" and "cross-border innovation cluster", the authors noted specialisation and methods of achieving competitiveness through the use of new comparative advantages. N. Danko & O. Izmailov (2025) analysed the cluster model of cross-border interaction between Ukraine and Poland in the context of European integration processes. The paper proposes a conceptual model of cyclical cluster cooperation, which includes five key phases: project initiation, harmonisation of the regulatory space, creation of cluster associations, project implementation, and evaluation of the results obtained. According to the authors, such a model is a universal tool for deepening strategic integration between countries, capable of increasing the competitiveness and promoting sustainable development of trade and economic cooperation. However, despite the rationality of the main idea, the model itself does not have a sufficient level of scientific novelty, looks somewhat declarative and disconnected from the realities of the dynamic environment of CBC. This is especially true of its application in the context of sustainable development and taking into account the interests of territorial communities.

S. Stegniy (2025) studied the impact and prospects of CBC between Ukraine and the European Union countries in the context of the intensification of European integration processes, taking into account the specifics of the regions, current challenges and strategic directions for the development of border areas. The author emphasised the importance of taking into account the social aspects of CBC, which go beyond purely economic tasks and cover such aspects as cultural exchange, population mobility, joint use of natural resources and strengthening the social capital of border communities. The scientist showed that the social consequences of such cooperation are manifested in increasing the accessibility of education, medicine and administrative services, deepening intercultural communication and activating civic initiatives. For example, thanks to joint projects of Lviv, Volyn and Zakarpattia regions with Polish partners, social assistance centres were created, joint historical and cultural routes were introduced and primary medical care conditions were improved. There is also a noticeable positive impact on the development of human capital: cross-border projects often include educational programmes, advanced training of local government employees, and support for youth initiatives.

Thus, CBC has a comprehensive socio-economic effect, covering not only the development of infrastructure and economic interaction, but also the formation of social capital and human potential of border areas. Achieving such results requires proper management support, capable of coordinating the interaction of participants and guaranteeing the sustainability of the implementation of joint initiatives. In this regard, the analysis of the practice of managing cross-border clusters as a key factor in the effectiveness and long-term development is of particular importance. The experience of European countries shows that the effectiveness of such clusters is determined primarily by the quality of the established management mechanisms that ensure the coordination of the interests of participants, the definition of strategic priorities and the creation of

appropriate institutional structures for the implementation of joint projects. An important role in this process is played by local governments, which initiate partnerships between entities of different states and provide institutional support for cluster initiatives.

One of the main aspects of managing CICs is the use of network models built on the principles of partnership, cooperation and shared responsibility. This approach contributes to increasing the flexibility of management processes, rapid adaptation to changes in the economic environment and effective coordination of innovation activities. At the same time, the implementation of strategic planning for cluster development plays a key role, which includes defining long-term goals, creating the necessary infrastructure to support innovation, as well as attracting investment resources. The legal aspect of the functioning of CICs is no less important. The effective implementation of cluster initiatives requires a clearly defined regulatory and legal environment that regulates the mechanisms of CBC, the legal status of cluster participants, the procedure for implementing joint projects and funding innovation activities. In Ukraine, the legal principles of CBC are determined by legislation in the field of local government, regional development and CBC.

The key regulatory act that defines the modern legal principles of CBC is Law of Ukraine No. 3668-IX (2024). This law establishes the legal, economic and organisational principles of international cooperation between regions and territories of Ukraine and other states, aimed at ensuring balanced socio-economic development of territories. The law defines: subjects of international territorial cooperation (local governments, regional authorities, legal entities); mechanisms for concluding agreements between territories of different states; forms of state support for such initiatives; participation of Ukrainian territorial communities in international development programmes. The adoption of this law was an important stage in the modernisation of the legal regulation of CBC and the approximation of Ukrainian legislation to European standards. A critical role in the formation of cross-border clusters is played by the legal regulation of the activities of territorial communities. The main regulatory act in this area is Law of Ukraine No. 280/97-VR (1997). The law defines the powers of local governments regarding the development of territories, participation in international cooperation and the conclusion of partnership agreements with foreign municipalities. It is local governments that often initiate cross-border cluster projects aimed at the development of innovative infrastructure and attracting investments. In addition, Law of Ukraine No. 156-VIII (2015) is of great importance, which defines the mechanisms for forming regional development strategies and supporting innovative activity in the regions. Within the framework of the implementation of the state regional policy, it is envisaged to stimulate cluster initiatives, develop interregional cooperation and integrate Ukrainian territories into the European economic space.

The functioning of CICs is also based on regulatory acts regulating innovation activity. Among these acts, Law of Ukraine No. 40-IV (2002) is of key importance. This law defines the legal and economic principles of state support for innovation processes, mechanisms for funding innovation projects, as well as incentives for the development of scientific and technological partnerships between enterprises and scientific institutions. In the context of cross-border clusters, the provisions of this law create legal prerequisites for the implementation of joint innovation projects between Ukrainian and foreign participants. In addition, CBC is considered in Ukraine as an important tool of European integration. This is confirmed by the recommendations of the parliamentary hearings of the Verkhovna Rada of Ukraine on the role of CBC in the development of regions and the deepening of European integration processes (Resolution of the Verkhovna Rada of Ukraine No. 1242-V, 2007).

Thus, the legal support of CICs in Ukraine is at the stage of active transformation and is gradually adapting to European standards of regional policy. However, despite the formation of a sufficiently developed regulatory framework, the analysis of the legislation enables determining a number of problems in the field of legal support of CICs. In particular: (1) fragmentation of regulatory regulation – cluster policy is not directly enshrined in a special law; (2) insufficient institutional coordination between state authorities and local governments; (3) limited financial mechanisms for supporting cross-border innovation projects; (4) differences in the legal systems of partner states, which complicates the implementation of joint projects.

Meanwhile, at the international level, an important legal document that defines the basic principles of CBC between territorial communities and authorities is the European Outline Convention (1980), adopted by the Council of Europe. This convention establishes legal mechanisms for cooperation between border regions of different states, determines the possibilities of concluding interregional agreements, creating joint organisational structures and implementing joint economic and social projects. It is on the basis of this convention that Euroregions and cross-border economic initiatives began to form in many European countries, which became a platform for the development of cluster models of cooperation. An important tool for the legal support of cross-border clusters in Europe is also the creation of special institutional forms of cooperation, in particular the European Grouping of Territorial Cooperation (EGTC) (n.d.). This legal mechanism allows local governments, regional authorities and other entities of different states to create joint organisations for the implementation of cross-border projects. Such structures can manage joint infrastructure, innovation and economic programmes, which contributes to the development of cluster initiatives at the interstate level. In addition to supranational legal acts, an important role in the development of cross-border clusters is played

by the national legislation of individual states, which regulates cluster policy and regional cooperation. Many European countries adopted special strategies and programmes to support clusters aimed at stimulating innovative activity, developing entrepreneurship and forming network forms of interaction between business, scientific institutions and authorities. Such programmes provide for financial support for cluster initiatives, developing innovation infrastructure and deepening cooperation between border regions (European Commission, 2016).

In Ukraine, cross-border cluster initiatives are mainly represented in border regions. The most active are the clusters of the Carpathian region (Ukraine, Poland, Slovakia, Hungary, Romania), which specialise in woodworking, ecotourism and the agricultural sector. In the Danube region (Ukraine, Moldova, Romania), cluster development is associated with logistics, shipping and maritime tourism. In the western direction (Ukraine – Poland), IT clusters and logistics centres operate, integrated into pan-European transport corridors, in particular the Gdańsk – Odesa direction. A separate group is made up of woodworking and tourism clusters of the Transcarpathian and Chernivtsi regions, which form partnerships with participants from Romania and Hungary (Ukrainian Cluster Alliance, n.d.).

The development of such structures contributes to the reduction of economic inequality in border areas and the intensification of European integration processes (Kotyhoroshko, 2017). At the same time, a significant part of cluster initiatives is at the stage of project implementation or strategic planning. Thus, the cross-border innovation cluster "Volyn – Chełm" functions as a platform for cooperation between business and universities, but its activities are mostly limited to individual projects without the formation of a fully developed cluster ecosystem (Interreg NEXT Poland-Ukraine, n.d.). Similarly, the Carpathian cross-border cluster (Ukraine – Poland – Slovakia – Hungary), formed within the Carpathian Euroregion, covers the areas of tourism, woodworking, green energy and creative industries, but functions mainly as a network of projects and platforms, and not as an institutionally structured cluster (Carpathian Euroregion, n.d.). In general, a characteristic feature of the development of cross-border clusters in Ukraine is the project-based nature, which determines dependence on external funding, in particular EU programmes. Only a small part of the clusters has a developed business ecosystem and stable management mechanisms. A summary of the main cross-border clusters of Ukraine and an assessment of the status are given in Table 3.

Table 3. *Main cross-border clusters of Ukraine and the status of these clusters*

Cluster	Year of creation	Regions / countries	Domain	Status
Bieszczady Cross-Border Tourism Cluster	2004	Poland (Bieszczady), Ukraine (Lviv region, Sambir and Turkiv districts)	Tourism, recreation	Partially active
Scientific-Information and Statistical Cluster "Infostat Ukraine–Poland"	2013	Ukraine (Lviv), Poland (Rzeszow)	Statistics, analytics, scientific research	Active (scientific)
Cross-Border Innovation Cluster (Poland–Ukraine)	2015	Poland (Chelm), Ukraine (Lutsk)	Innovation, business cooperation	Partially active
Dnister International Agricultural Cluster	2018	Ukraine (Vinnytsia region), Moldova	Agricultural sector, processing	Promising
Carpathian tourism and recreation cluster initiatives	2010	Ukraine, Poland, Slovakia, Hungary	Tourism, green economy	Project format

Source: *compiled by the authors*

One example of international cluster cooperation with the participation of Ukraine is the ITBridge: EU-Ukraine IT cluster (2025) project, which unites such organisations as Kharkiv IT Cluster, IT Dnipro Community, Odesa IT Family, as well as Transilvania IT Cluster and Digital Cluster of Catalonia. The project is aimed at integrating Ukrainian IT companies into the European market, developing digital innovations and expanding international partnership in the field of information technologies. At the same time, an analysis of the content of the project's activities shows that its main focus is on economic and technological aspects of cooperation, while the issue of sustainable development of territorial communities is not a central element of its strategic agenda.

The experience of European countries shows that the effective development of cross-border clusters requires comprehensive institutional support, a clear legal framework and a coordinated state policy. The active participation of business, the presence of a developed innovation infrastructure and access to international financial resources are crucial. For Ukraine, borrowing such experience is especially important in the context of European integration and post-war economic recovery. The development of CICs can be an effective tool for including regions in the European economic space, stimulating innovation and increasing the competitiveness. At the same time, the realisation of this potential requires improving the regulatory environment, strengthening the institutional capacity of territorial communities and intensifying Ukraine's participation in EU CBC programmes.

The effective formation of cross-border regional business clusters should be based on the coordination of interests of all key stakeholders and taking into account the role in the development of cluster initiatives. Particular

attention should be paid to the involvement of participants with high innovation potential, who can act as drivers of development, but currently do not have a sufficient level of influence to implement the own initiatives. In this context, it is advisable to highlight the following strategic directions for the formation of effective CICs:

1. Reducing legal and regulatory uncertainty. It is advisable to create interregional bi- and multilateral working groups aimed at harmonising approaches to the formation of public-private partnerships (PPPs), special purpose vehicles (SPVs), investment platforms and financial instruments, as well as unifying financial reporting standards. Such an approach will contribute to increasing legal certainty through the coordination of regulatory procedures and dispute resolution mechanisms.

2. Strengthening policy coordination and stakeholder interaction. The formation of a coordinated policy based on a comprehensive analysis of network relationships will make it possible to increase the efficiency of the use of regional potential and contribute to the achievement of the goals of socio-economic cohesion. Institutionalised interaction between state and non-state actors, ensured through permanent coordination mechanisms, creates the prerequisites for the development of open partnership and deepening integration processes.

3. Development and implementation of long-term development programmes. Increasing the effectiveness of cross-border clusters requires the implementation of comprehensive strategic programmes integrated into the national regional development policy. Coordination of economic, legal and budgetary instruments creates favourable conditions for the implementation of infrastructure and innovation projects that ensure sustainable development of territories.

The results obtained in this study showed that the effectiveness of CICs is largely determined by the level of institutional coordination and the ability to form sustainable network relationships between participants. This is consistent with the findings of T. Makkonen & S. Rohde (2016), who underscored the role of cross-border interactions in shaping the innovation potential of regions, as well as with the approach of J. Kurowska-Pysz *et al.* (2018), which substantiated the importance of strategic planning of CBC as a basis for the formation of sustainable partnerships and the development of border areas. At the same time, the results of the study confirmed the importance of developing partnerships between business, state institutions and communities, which corresponds to the approach proposed by B. Singh & S. Chandra (2025), where the emphasis is on multi-level cooperation as the basis of sustainable development. In addition, the results obtained are consistent with the provisions of O.A. Luhova & D.M. Gumenyuk (2012), which consider cross-border clusters as a tool for economic modernisation, development of applied research, sharing of infrastructure and attracting investment, which together ensure the structural transformation of regions and increase the competitiveness.

The analysis of practical cases also showed that the key factor in the success of clusters is access to financial resources and support from the state, which correlates with the results of C. Ketels & S. Protsiv (2021), who noted a significant share of public funding in the structure of European cluster systems. At the same time, the results obtained revealed that in Ukraine, cross-border cluster initiatives are often project-based and do not form fully developed innovation ecosystems, which partially confirms the conclusions of N. Reznikova *et al.* (2020) regarding the need to clearly distinguish between types of cluster formations and mechanisms for the functioning. In addition, it was found that the effectiveness of clusters increases under the conditions of integration of innovative technologies and the development of digital interaction platforms, which corresponds to modern trends described by Y. Zhao *et al.* (2024). Thus, the results of the study confirmed global approaches to economic clustering, while at the same time revealing specific institutional and management limitations to the development of cross-border clusters in Ukraine.

Conclusions

As a result of the study, it was found that CICs are an important tool for ensuring the sustainable development of territorial communities, especially in border regions, which are characterised by limited development resources, peripheral location and the need to intensify economic activity. The cluster approach contributes to the formation of effective network interactions between enterprises, scientific institutions, authorities and the public sector, which creates the prerequisites for increasing the innovative capacity of territories. An analysis of international experience showed that the development of cross-border clusters in the world is based on a comprehensive regulatory and legal framework, which includes international agreements, regional cooperation programmes and national strategies for supporting cluster development. A special role in the formation of such mechanisms is played by EU institutions, which provide financial and institutional support for cross-border initiatives through territorial cooperation programmes, in particular Interreg. An important legal instrument for the development of CBC is also the European Outline Convention on Transfrontier Cooperation, which created a legal basis for interaction between regions of different states.

The study showed that in European countries, cross-border clusters function as effective innovation ecosystems that combine research institutions, enterprises, innovation centres and regional government bodies. Such a model contributes to the development of an innovative economy, increasing the competitiveness of regions and implementing the principles of sustainable development at the local level. At the same time, an analysis of the current state of development of cross-border clusters in Ukraine indicates the presence of significant potential for the formation, in particular in border regions with European Union countries. However, the effectiveness of the functioning is limited by a number of factors, including the fragmentation of the regulatory framework, insufficient coordination between institutions, limited financial

resources and an insufficient level of business involvement in cluster initiatives.

A particularly important result of the study is the establishment that the majority of cross-border cluster initiatives in Ukraine are project-based and do not transform into stable institutional structures, which limits the long-term impact on the development of territories. The conducted systematisation of clusters showed that only a small part of these clusters functions as fully developed innovation ecosystems, while the vast majority is at the stage of partial activity or depends on external funding. The results obtained make it possible to clarify the role of cross-border clusters in the public administration system as a tool, the effectiveness of which is determined not only by the availability of resources, but also by the level of institutional integration and the quality of management mechanisms. In this context, an important direction for further development is to improve the legal support for cluster policy, create effective mechanisms for managing cross-border cluster structures, as well as increase the participation of territorial communities in international cooperation programmes. The implementation of these measures will contribute to the formation of innovation ecosystems in border regions, strengthen the economic integration of Ukraine with the European space and ensure the sustainable development of territorial communities.

Acknowledgements

None.

Funding

None.

Conflict of Interest

None.

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Транскордонні інноваційні кластери як інструмент сталого розвитку територіальних громад: управлінський та правовий аспект

Генрієтт Карої
Аспірант
Університет Джона фон Неймана
6000, вул. Izsáki út, 10, м. Кечкемет, Угорщина
https://orcid.org/0009-0006-1480-7245
Дарія Іващенко
Доктор філософії з міжнародного права, доцент
Державний торговельно-економічний університет
02156, вул. Кіото, 19, м. Київ, Україна
https://orcid.org/0000-0003-4123-6821
Володимир Подібка
Аспірант
Приватний вищий навчальний заклад «Європейський університет»
03115, б-р Академіка Вернадського, 16В, м. Київ, Україна
https://orcid.org/0009-0009-5362-980X
Мирослав Жданкевич
Аспірант
Таврійський національний університет імені В. І. Вернадського
01103, вул. Джона Маккейна, 33, м. Київ, Україна
https://orcid.org/0009-0007-8280-449X
Олександр Хоцький
Аспірант
Поліський національний університет
10002, б-р Старий, 7, м. Житомир, Україна
https://orcid.org/0009-0000-2016-1168

Анотація. Актуальність дослідження зумовлена необхідністю пошуку ефективних інструментів забезпечення сталого розвитку територіальних громад, зокрема в умовах євроінтеграції та зростання ролі транскордонного співробітництва. Метою статті було дослідження управлінських і правових аспектів формування та функціонування транскордонних інноваційних кластерів як інструменту стимулювання регіонального розвитку. Методологічну основу становить міждисциплінарний підхід із використанням порівняльного, інституційного аналізу та методу кейс-стаді. У результаті дослідження встановлено, що транскордонні інноваційні кластери виступають ефективним механізмом інтеграції економічних, інноваційних і соціальних ресурсів прикордонних територій, забезпечуючи формування мережевих взаємодій між бізнесом, наукою та владою. Аналіз європейського досвіду показав, що їх успішність базується на поєднанні інституційної підтримки, розвиненої нормативно-правової бази та активної участі органів публічного управління. Узагальнення практичних кейсів дозволило виокремити ключові ефекти транскордонних проєктів, зокрема економічний, інноваційний, інфраструктурний, соціальний та інституційний. Водночас встановлено, що в Україні більшість транскордонних кластерних ініціатив має проєктний характер і не трансформується у сталі інституційні структури, що обмежує їх довгостроковий вплив. Виявлено, що основними стримуючими факторами є фрагментарність правового регулювання, недостатня координація між інституціями та обмеженість фінансових ресурсів. Обґрунтовано необхідність розвитку ефективних управлінських механізмів, гармонізації нормативної бази та посилення участі територіальних громад у міжнародних програмах співробітництва. Практична цінність дослідження полягає у можливості використання отриманих результатів для вдосконалення державної регіональної політики та формування ефективних моделей управління транскордонними кластерними ініціативами

Ключові слова: регіональна інвестиційна політика; транскордонне співробітництво; єврорегіони; інноваційні екосистеми; правове регулювання

DEMOCRATIC GOVERNANCE
Vol. 19, No. 1, 2026, 46-55
Journal homepage: https://d-governance.com.ua/
Received: 09.02.2026; Revised: 04.05.2026; Accepted: 28.05.2026; Published: 25.06.2026

UDC 35:004.8]:34
DOI: 10.56318/dg/1.2026.46

E-ISSN 2070-4038

Modernisation of public administration tools: Legal regulation of AI as a factor in increasing the effectiveness of public policy

Sandeep Kumar Gupta
Doctor of Philosophy, Professor
Mohanbabu University
517102, Sree Vidyanikethan, Sree Sainath Nagar, Tirupati, India
https://orcid.org/0000-0002-2670-2858

Solomiia Hanushchyn
Doctor of Public Administration, Associate Professor
Stepan Gzhytskyi National University of Veterinary Medicine and Biotechnologies of Lviv
79010, 50 Pekarska Str., Lviv, Ukraine
https://orcid.org/0000-0002-6328-9978

Andrii Zarichniak*
PhD in Economics, Associate Professor
Vasyl Stefanyk Precarpathian National University
76018, 57 Shevchenko Str., Ivano-Frankivsk, Ukraine
https://orcid.org/0000-0001-7191-6583

Liudmyla Akimova
Doctor of Public Administration, Professor
Cyprus University of Technology
3036, 30 Archbishop Kyprianou Str., Limassol, Cyprus
National University of Water and Environmental Engineering
33028, 11 Soborna Str., Rivne, Ukraine
https://orcid.org/0000-0002-2747-2775

Oleksandr Akimov
Doctor of Public Administration, Professor
Interregional Academy of Personnel Management
03039, 2 Frometivska Str., Kyiv, Ukraine
Scientific and Methodological Centre for Personnel Policy of the Ministry of Defence of Ukraine
03113, 55/2 Beresteyskyi Ave., Kyiv, Ukraine
https://orcid.org/0000-0002-9557-2276

Abstract. The article focuses on changing the tools of public policy under the influence of artificial intelligence (AI). The aim of the study was to conceptualise the role of legal mechanisms in the transformation of management processes and the formation of new models of interaction between the state, technologies, and society. The methodological basis of the study was a qualitative approach based on policy analysis using elements of case studies and comparative analysis. This approach made it possible to identify key patterns in the interaction of legal regulation, institutional practices and the use of intelligent systems in public administration. The paper analysed the impact of the introduction of intelligent solutions in the executive and legislative branches on the architecture of law and standards of effective governance. The international experience of legal support for national security in the conditions of digital autonomy of systems was considered. Strategic directions for updating public administration are identified to ensure social justice and environmental sustainability. The study found that the introduction of AI contributes to the transformation of the

Suggested Citation:
Gupta, S.K., Hanushchyn, S., Zarichniak, A., Akimova, L., & Akimov, O. (2026). Modernisation of public administration tools: Legal regulation of AI as a factor in increasing the effectiveness of public policy. *Democratic Governance*, 19(1), 46-58. doi: 10.56318/dg/1.2026.46.

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**Corresponding author (andriy_zarichnyak@pnu.edu.ua)*

architecture of law, the formation of algorithmic forms of management and the transition to adaptive, risk-oriented models of regulation. It was proven that effective legal regulation of AI ensures increased transparency, accountability, and quality of management decisions, and also minimises the risks associated with the use of algorithmic systems. It was proposed to consider legal regulation of AI not only as a reaction to technological challenges, but as a proactive mechanism for the formation of an innovatively oriented, socially responsible and safe model of public administration. The results of the study can be used to develop effective strategies for the digital transformation of public administration and improve the legal principles of regulating AI

Keywords: law; tools; sustainable development; effective management; national security

Introduction

Deep transformations of modern society, caused by the rapid development of digital technologies, form a new paradigm of the functioning of the state, in which data, algorithms and intelligent systems become key resources of public administration. A special place in these processes is occupied by artificial intelligence (AI), which is increasingly integrated into the mechanisms of development, implementation, and evaluation of public policy. This causes not only a technological update of management practices, but also a significant transformation of the institutional architecture of the state, which is manifested in a change in the role of decision-making subjects, the emergence of new forms of public authority and a revision of the principles of legal regulation. The relevance of the current study is due to the need to form an adequate legal environment capable of ensuring a balance between innovative development and the protection of basic social values.

In the context of the formation of a digital state, the evolution of public administration tools from traditional administrative and legal means to complex, data-oriented and algorithmically supported mechanisms is taking place. F. Sesso (2025) emphasised that the use of AI in public administration covers a wide range of functions: from the automation of administrative procedures and the provision of electronic services to the forecasting of socio-economic processes, risk management and support for strategic planning. At the same time, such a transformation actualises fundamental questions regarding the legitimacy of algorithmic governance, the limits of delegation of power to technical systems, as well as ensuring transparency, accountability, and non-discrimination of decisions made using AI. In the context of the growing autonomy of intelligent systems, law appears not only as a regulatory tool, but also as a mechanism for institutional construction of new forms of interaction between the state, society, and technology. As noted by O. Musii (2025), the lack of a clear legal framework for the use of AI in public administration can lead to increased asymmetry of power, reduced trust in public institutions, as well as the emergence of systemic risks to national security, including cyber threats, data manipulation and opaque algorithmic interference in social processes.

In this context, studies that consider digitalisation through the prism of security transformations are critical. In particular, O. Sydorchuk *et al.* (2024) showed that the integration of digital technologies into the security sector forms a complex dynamics of change, which manifests itself at the intersection of technological, social and economic factors. And although the authors did not focus on the problems of implementing AI, they, based on modelling changes in the state security system, showed how digital infrastructure is both a factor in increasing management efficiency and a source of new risks. This highlights the need for comprehensive regulation and integration of security approaches into digital development policies.

An analysis of modern scientific research showed a growing interdisciplinary interest in the use of AI in public administration. In particular, A. Aarab *et al.* (2025) showed that the implementation of AI can increase the efficiency and transparency of public institutions, but is accompanied by a number of institutional limitations, including data fragmentation, insufficient digital infrastructure and a shortage of competencies. The authors also showed that the effective integration of AI requires a comprehensive transformation of management, including the development of digital resources, human resources and strategic leadership mechanisms. At the same time, G. Hill *et al.* (2025) focused on the transformation of the legislative process, justifying the potential of using LLM systems to optimise the development of regulatory acts, in particular in countering disinformation. The authors also pointed out the need to take into account the risks associated with the reliability and responsibility of algorithmic decisions.

Meanwhile, the existence of a conceptual gap between the technological capabilities of AI and the existing legal instruments for the regulation, according to M. Ighofiomoni (2025), is a significant problem. It manifests itself in the fragmentation of regulatory approaches, the lack of unified standards for evaluating algorithmic solutions, as well as the insufficient integration of the principles of ethics and human rights into the processes of developing and implementing intelligent systems. As a result, there is a need to form a new model of public administration, in which legal regulation acts not only as a restrictive but also as a stimulating factor for innovations, while ensuring the social orientation and safety.

Analysis of modern scientific research showed the growth of interdisciplinary interest in the issues of using AI in public administration. The works of scientists consider the issues of digital governance, algorithmic responsibility, regulatory policy in the field of new technologies, as well as the transformation of public institutions under the influence of digitalisation. However, despite the significant

volume of scientific work, the complex impact of legal regulation of AI on the effectiveness of public policy as a systemic phenomenon that encompasses the interaction of institutions, norms, processes, and results of management activities remains insufficiently studied.

The aim of the article was to theoretically substantiate and conceptualise the role of legal regulation of AI as a key factor in the modernisation of public administration tools and increasing the effectiveness of public policy. To achieve this goal, the following tasks were defined: to study the transformation of public administration tools under the influence of AI; to analyse international experience in legal regulation of intelligent systems; to identify strategic directions for improving public policy in the context of digital transformation.

Materials and Methods

The methodological architecture of the study was based on an interdisciplinary approach that combined tools of public administration, law, and research in the field of digital technologies. This approach allowed for a comprehensive analysis of the transformation of the public policy toolkit under the influence of AI, and to substantiate the role of legal regulation as a key factor in increasing its effectiveness. The philosophical basis of the study was chosen to be constructivism, which was based on the understanding of social reality as one that was formed in the process of interaction between actors, institutions, and discourses. In the context of public administration and legal regulation of AI, the constructivist paradigm made it possible to consider legal norms, management practices and technological solutions not as objectively given and static elements, but as socially constructed phenomena that evolved under the influence of political, economic and cultural factors. This approach made it possible to investigate how understanding of the permissible limits of the use of AI was formed in different institutional contexts, how perceptions of risks, ethical standards and the effectiveness of public policy were constructed, as well as how these perceptions affected the processes of norm-setting and managerial decision-making. The study used a qualitative research strategy that combined policy analysis, comparative analysis and case studies.

Policy analysis was used for a systematic study of regulatory acts, strategic documents and regulatory approaches in the field of AI. The objects of analysis were documents of the international and national levels, in particular the AI Act of the European Union (European Commission, 2024), Executive Order 14110 (2023) of the USA, national AI development strategies, as well as recommendations of international organisations (OECD, NIST). The analysis was carried out according to the following criteria: type of regulatory model, level of bindingness of norms, approaches to risk management, mechanisms for ensuring transparency and accountability, as well as the level of protection of human rights.

Comparative analysis was used to compare different models of AI regulation (European, American, and Asian). The comparison was carried out according to unified parameters: the degree of centralisation of regulation, the nature of regulatory instruments (hard/soft), approaches to risk classification, the presence of control and liability mechanisms. This made it possible to identify the patterns of the formation of regulatory systems and the impact on the effectiveness of public administration. The case study method was used for an in-depth analysis of specific examples of the implementation of legal regulation of AI in the field of public administration. The selection of cases was carried out on the principle of theoretical representativeness and included jurisdictions that demonstrated different types of regulatory models and levels of technological maturity. The analysis included cases of AI use in the areas of public services, social policy, security, and rulemaking (in particular, the USA, EU countries, South Korea). The case analysis covered legal and regulatory acts, strategic documents, digital development policies, as well as practices of using intelligent systems in the activities of public authorities. It was carried out according to the following parameters: the functional role of AI (analytical, predictive, automation), impact on the decision-making process, the level of transparency of algorithms, control and audit mechanisms, as well as the presence of risks (algorithmic bias, opacity, security threats). This made it possible to establish a connection between the characteristics of legal regulation and the actual effectiveness of the use of AI in public administration.

To generalise the results, methods of analysis, synthesis, systematisation and generalisation were used, which made it possible to form a holistic conceptual model of the interaction of legal regulation and the effectiveness of state policy. The reliability and validity of the results were ensured through the use of methodological triangulation, which involved combining different data sources (scientific publications, regulatory legal acts, analytical reports of international organisations) and different analysis methods. This made it possible to minimise the subjectivity of interpretations and increase the validity of the conclusions obtained.

Results and Discussion

AI in the practice of public administration: A landscape of changes, opportunities, and dilemmas of responsibility

Modern social development is characterised by the accelerated digital transformation of key areas of life, in particular the public administration system. The constant increase in the volume of information, the expansion of the spectrum of data sources, as well as the growing complexity of socio-economic processes, form the objective need for the implementation of innovative technologies that can increase the validity, efficiency, and quality of management decisions. In these conditions, AI technologies acquire particular importance, since these technologies allow not only to automate the processing of large data sets, but also to significantly expand the analytical and predictive capabilities of public authorities. Of particular interest are neural networks and deep learning technologies designed to solve

complex modelling and forecasting tasks. In the system of public and municipal administration, these technologies are used to assess the future volume of demand for state and municipal services, plan the load on social, medical and administrative institutions, as well as to optimise the distribution of human and financial resources. Therefore, the implementation of these technologies contributes not only to increasing the efficiency of management, but also to increasing the quality of life of the population.

With the development of these technologies, integrated AI platforms are being formed that combine various analytical mechanisms into a single system. Such platforms provide the opportunity to work not only with formalised digital arrays, but also with high-quality information, including texts, images, and multimedia data. As noted by A. Aarab *et al.* (2025), as a result, the interaction of an AI specialist becomes more natural, dialogical in nature, which expands the range of practical use of these systems in the activities of public authorities at all levels of administration. According to the forecasts of the research company Future Market Insights (AI in government…, 2025), between 2025 and 2030 the market for AI in public administration and public services will grow from 26.4 billion US dollars to 60.2 billion US dollars, which will lead to an increase in value by 33.8 billion US dollars, and will account for 30.9% of the total projected growth for the decade. This growth phase will be determined by the acceleration of digital government initiatives, increased investment in "smart city" infrastructure and the growing implementation of AI-based services for citizens. Public authorities are expanding the implementation of AI to meet the growing demand for efficient, transparent and accessible public services

At the same time, as the role of AI in management practice grows, the need for theoretical understanding of the nature of transforming management activities is becoming more urgent. The active use of intelligent systems gives rise to a number of debatable issues related to the rethinking of the essence of a management decision. Increasingly, algorithms and digital systems act not only as an auxiliary tool, but also acquire the characteristics of an independent participant in the process of analysis, forecasting and selection of alternatives. In this regard, a problem naturally arises: does a management decision retain its traditional nature if it is fully or partially formed using AI algorithms, and to what extent is it permissible to redistribute cognitive functions from a person to a machine. However, along with the expansion of the scope of AI, the associated risks also increase. According to a study by S. Giest *et al.* (2025), one of the most important problems remains the quality of input data. The heterogeneity of information sources, the lack of unified standards, errors in data collection, as well as ethical and legal restrictions can reduce the accuracy of algorithms and, as a result, negatively affect the quality of management decisions made. An additional difficulty is the "opacity" of deep learning algorithms, which operate on the principle of a "black box", which complicates the interpretation of the obtained results. In addition, as emphasised by H. Dei (2025), one cannot ignore the risk of discriminatory effects caused by errors in training samples or software settings of developers. The threat of personal data leakage is also growing, which places increased demands on information security and the protection of confidential information and personal data. That is why the creation of a risk management system, which involves the use of alternative sources of information and multi-level control mechanisms when making socially and politically significant decisions, is of particular importance.

This leads to the emergence of a new discourse on legal issues. In particular, as AI is introduced, the very concept of a management decision is undergoing transformation. Traditionally, it is perceived as the result of intellectual activity, based on a combination of rational analysis, professional experience and intuition. A management decision is the result of analysis, forecasting, evaluation of alternatives and selection of the optimal option for achieving the management goal (Chen *et al.*, 2023). At the same time, the intuitive component often allows taking into account the unique features of a specific situation, which are always amenable to algorithmisation. In this context, S. Arya & I. Shroff (2025) noted that the issue of distributing responsibility for decisions made using AI, delimiting the area of responsibility between algorithm developers, system users and public authorities implementing these technologies, is of particular relevance. This, in turn, requires improving the regulatory and ethical framework governing the use of AI in public administration. At the same time, it is important that the ultimate responsibility for the consequences of the decision remains with the person as the subject of management.

Paradigm shift

The introduction of AI in public administration brings not only financial benefits, allowing to save a significant amount of money by automating many processes (up to 1.2 trillion dollars by 2030), but also completely new mechanisms for modelling government programmes (Krasodomski *et al.*, 2024). Moreover, machine learning algorithms help analyse big data to predict socio-economic trends (Zaenal & Astuti, 2025). If earlier analytical structures or representatives of the expert and scientific community were involved for such work, now part of socio-economic forecasting is carried out by AI. Its application in state and municipal structures is not limited to improving existing processes, but, according to A. Ahammad (2025), becomes a catalyst for creating innovative approaches that radically change the nature of interaction between government and society. In this vein, media and mass media are monitored to identify current events, as well as stable public opinion on a particular issue, which enables reducing the distance between the state and citizens, as well as responding more quickly to problems that are important to the population. Moreover, AI acts as an impartial actor in the field of public services, so it can be entrusted with control functions. Global discussions on AI mainly focused on governments as regulators or investors in AI, but

significant opportunities exist for governments as developers and users of AI (Aarab *et al.*, 2025; Ahammad, 2025). Governments are not only setting national priorities, investments, and regulations for AI, but are also increasingly using it to develop and implement policies and services. Although the hype around AI grew in the last few years, governments are not new to the use of AI; thousands of government projects with AI are being implemented around the world.

Since 2019, the Organisation for Economic Co-operation and Development (OECD) was working to better understand the uses and implications of AI in the unique context of government. This includes: developing background papers on the technical foundations of AI, its uses and implications for government; conducting targeted country-specific analyses; identifying trends in government innovation that are often linked to AI; and creating a preliminary framework for AI in government. The OECD also compiled detailed information on hundreds of initiatives on the use of AI in government (OECD, 2024). Types of AI for public services are summarised in Figure 1.

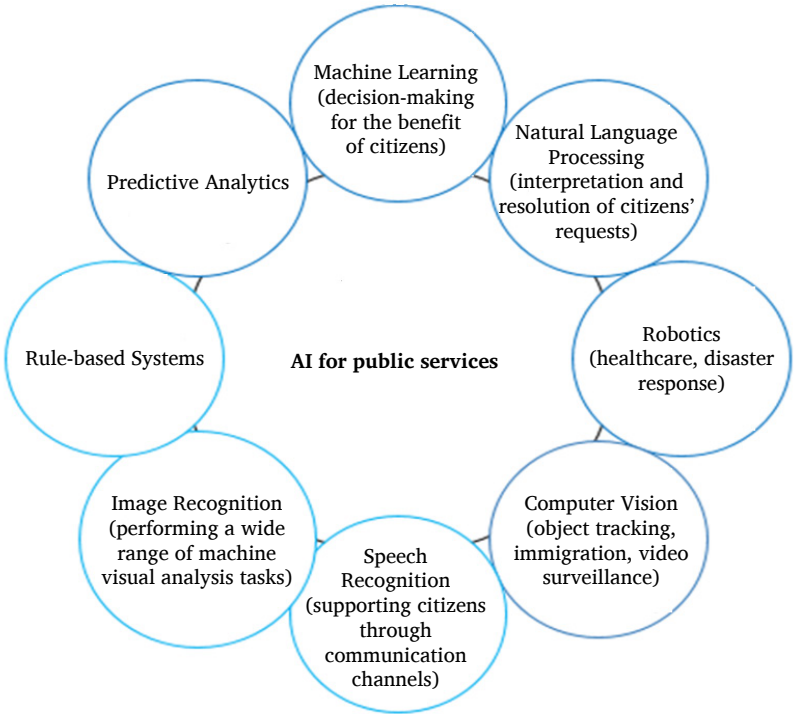

Figure 1. *Types of AI for public services*

Source: *developed by the authors*

The AI solutions classifier developed by European experts A. Batool *et al.* (2025) demonstrates the diversity of intelligent tools for solving state-scale tasks, as well as the scope of the practical application (Table 1). It allows both to systematise approaches to the implementation of AI and to outline trajectories for further improvement of digital governance, aimed at increasing its efficiency, improving the standard of living of citizens and sustainable development.

Table 1. *Classifier of AI solutions for public administration*

No.	AI solutions	Description	Pilot projects
1	Government digital avatar	A personalised AI assistant integrated into the government services ecosystem. Unifies data, provides tips and notifications	Estonia: Bürokratt; UAE: RAMMAS
2	AI platform for modelling socio-political scenarios	Predicts the consequences of decisions by analysing social and economic data	United Kingdom: Policy; Simulation Tools
3	Flexible AI management of bureaucratic processes	Optimises internal processes, eliminates duplication and speeds up reconciliation	Canada: Agile Government
4	AI advisor for regulatory experimentation	Identifies outdated regulations, suggests launching «regulatory sandboxes» and assessing risks	United Kingdom: FCA Regulatory Sandbox
5	AI architect of personalised social policy	Forms personalised social packages taking into account the life situation of the citizen	Finland: Kela
6	AI algorithm for strategic positioning of the region	Analyses competitive advantages and proposes regional development	USA: REM
7	AI for public procurement auditing	Automates procedures, ensures continuous and large-scale auditing of public procurement, identifying risks of fraud and errors	Brazil: Alice

Table 1. *Continued*

No.	AI solutions	Description	Pilot projects
8	Platform for analysing public opinion	Analyses citizens' proposals, classifies and clusters ideas, problems, complaints, identifies and summarises trends	Belgium: CitizenLab
9	Virtual assistant for immigration services	Assists applicants with immigration matters by providing information about services and directing applicants to the sections of the site the applicants need.	USA: EMMA
10	AI tool for document generalisation	Summarising the content of various documents (letters, speeches, minutes), which facilitates working with information	United Kingdom: Redbox Copilot

Source: *A. Batool et al. (2025)*

In different countries, there are already many AI solutions for the needs of state administration. For example, in the USA, the HUD-AI software is used, which distributes housing subsidies, reducing the processing time of applications from 3 weeks to 48 hours (Islam *et al.*, 2024). The development and implementation of AI is carried out within the framework of a partnership between the state and large IT companies: AI developers receive large funding and the opportunity to implement the ideas, and the state is ready to implement AI tools that not only reduce the time for solving routine tasks, but also automate analytical processes and strategic planning. The scale of such partnerships is constantly expanding, but the integration of AI into state structures cannot yet be called widespread, since the activities of government agencies are possible without the participation of such technologies, and bigtech corporations only in interaction with private players (Krasodomski *et al.*, 2024). But partnerships are developing, and the intensity of this process will determine the future infrastructure of public administration and its effectiveness. The idea of buying ready-made solutions from large international digital corporations can act as a brake. It is possible that these technologies will turn out to be cheaper and more functional than national counterparts, but the purchase of a foreign product creates a certain type of dependence on its manufacturer, which can have negative consequences in conditions of geopolitical turbulence.

South Korea is a world leader in public administration based on AI, ranking first in terms of the level of maturity of AI in government (OECD, 2024). The government is rapidly integrating AI into public administration (chatbots, AI-based police surveillance), while implementing the 2026 Basic Law on AI, which focuses on balancing industrial innovation with security, risk management and mandatory human control over systems that have a significant impact, under the supervision of a presidential committee. Key aspects of AI in South Korea's public administration include the following (Johnsen, 2025):

1. Comprehensive regulatory framework. The Basic Law on AI (effective from January 2026) aims to promote the development of AI while also establishing safety regulations. It defines "high-performance" AI (e.g. in healthcare, finance, transportation) and provides for human oversight, risk assessment, and transparent labelling in the field of AI.

2. National strategy and framework. According to the National Strategy for 2019-2030, South Korea aims to become a top three nation in the field of AI. The National Strategy Committee on AI, chaired by the president, is the main decision-making body that promotes public-private cooperation.

An analysis of contemporary political and economic challenges by M. Rajaei & A. Amiri (2025) showed that in the long term, a state's competitive advantage will be determined by its ability not only to implement AI solutions, but also to adapt these solutions to rapidly changing conditions. In this context, the authors identified a set of key areas of public administration transformation, which are systematised in Table 2.

Table 2. *Key areas of adaptation of public administration to the implementation of AI*

Direction	Basic components	Characteristic
Modernisation of management models	Interdepartmental coordination; staff training; flexible regulation (sandbox)	Institutional orientation restructuring management, which provides integration of AI into operations of public authorities and increase the adaptability
Infrastructure investments	National data centres; cross-cutting technologies (quantum computing, edge-computing); open API platforms	Formation of technological foundations for a safe, independent and effective use of AI in various sectors of public management
Ethical framework for the use of AI	Algorithm audit; public risk reporting	Software transparency, accountability, and respect for human rights in the use of intelligent systems

Source: *created by the authors based on M. Rajaei & A. Amiri (2025)*

The presented directions demonstrate that the effective integration of AI into public administration requires a systemic approach that combines institutional, technological and ethical components. In this case, the key factor is not only the technological capacity of the state, but also the ability to ensure consistency between the development of infrastructure, management practices and control mechanisms, which together determine the sustainability and legitimacy of digital transformation. Thus, AI ceases to be just a technology; it becomes a strategic resource for a new generation of public administrators, thanks to which the public administrators will be able to gain significant

professional advantages and improve the efficiency and quality of the work.

Legal problems of implementing AI technologies into the system of public governance and administration

One of the most important problems of regulating the implementation of AI into the system of public administration remains the lack of uniform standards of algorithmic transparency and accountability. For example, the use of neural interfaces is practically not covered by legal regulation, as emphasised by V.V. Febiandini & M.S. Sony (2023). In this regard, a number of researchers propose to develop a certain paradigm of "smart (self)restraint", which would allow for a more conscious and responsible implementation of AI technologies in the management of socio-economic processes. According to the study by D.B. Vuković *et al.* (2025), the use of AI in public services, including in the distribution of social assistance, tax control or automatic identification of violations, is not accompanied by unified decision-making verification mechanisms. According to the authors, in the USA, AI decisions in migration control systems were repeatedly criticised for being a "black box" of algorithms, the evaluation criteria of which are not available to either applicants or lawyers. At the same time, there is no obligation for government agencies to justify decisions made on the basis of AI analysis, which contradicts the principles of administrative transparency.

In addition, A.F. Vatamanu & M. Tofan (2025) drew particular attention to the risks of violations of fundamental human rights. In particular, in the practice of China and some other states, there are known cases of the use of AI in social rating systems, predictive police analysis and automatic monitoring of citizens' behaviour. Such measures call into question the observance of the rights to privacy, freedom of movement and the presumption of innocence. In the EU, on the contrary, in accordance with the AI Act (European Commission, 2024) and the General Data Protection Regulation (2018), the use of AI in certain high-risk areas is prohibited without strict adherence to human rights impact assessment procedures. It is important that the status of AI remains uncertain. AI is not considered a subject of law, but its specific status as a special object of regulation in administrative activities is not fixed either. This creates difficulties in establishing liability for damage caused by the use of AI, especially in the case of a mixed decision-making architecture (human + algorithm).

In general, the legal regulation of AI in public administration is at the stage of formation and is characterised by a high degree of heterogeneity and contradictions both at the national and international levels. At the same time, the contradictions between innovative development and legal certainty are relevant. Technological transformation requires flexibility of legal regulation, however, excessively soft or framework approaches (for example, recommendatory models in the USA) can contribute to the reduction of legal guarantees and the increase in the arbitrariness of administrative decisions. At the same time, excessively rigid models, as in China, can lead to a slowdown in the development of AI technologies in the country and difficulties in promoting solutions focused only on the domestic market abroad. C. Bailey (2023) emphasised that the use of ultra-technological tools, such as neurotechnologies, in public administration creates increased risks for ensuring the rights of citizens, since legal doctrines and legislation cannot keep up with the rapid updating of technological realities in administrative processes.

At the same time, there is a discrepancy between the legal structures of classical administrative law and the tasks of digital transformation. The ideas of AI management contradict the established principles of personal responsibility of an official, publicity of the procedure and equality of parties. Automated decision-making complicates the application of the institution of administrative appeal, especially if the algorithm is recognised as a commercial or state secret. Thus, legal norms require adaptation, including the introduction of the categories of "algorithmic governance", "technical administrator" and "digital solution expertise". In addition, the problem of international harmonisation of legal approaches is becoming increasingly relevant. There is no consistency in the definitions and classifications of AI systems between the EU, the USA, and China (Arya & Shroff, 2025). In the EU, AI is classified by the level of risk, in China – by the degree of influence on public opinion, in the USA – by the type of technology (Islam *et al.*, 2024). The lack of common concepts complicates international coordination, especially in the field of cross-border public services, for example, when issuing visas, background checks or recognising digital signatures generated using AI. Finally, one cannot ignore the political and legal challenges of liability. The difficulty in determining the subjects of liability for administrative decisions made by AI gives rise to a new form of legal uncertainty. For example, if the tax service made a decision to block an account based on AI analysis of transactions, the question arises as to who is responsible: the operator of the algorithm, the state, the programmer or a specific official. Such issues require the development of a doctrine of "distributed administrative liability" with the possibility of multi-level control, as well as the consolidation in the legislation of the appropriate terminology that makes it possible to determine the developer, owner, operator, and user of AI or a system using AI.

In general, the legal aspects of introducing AI technologies into the sphere of public administration are a complex and multi-level phenomenon, which includes both general issues of the legal status of algorithmic solutions and private aspects related to procedural guarantees, protection of citizens' rights and institutions of responsibility. Thus, the legal aspects of introducing AI into public administration require a rethinking not only of individual norms, but also of fundamental legal concepts underlying public law, including taking into account the recommendation documents of international intergovernmental organisations (for example, the UNESCO Recommendations

in the field of AI). The development of legal mechanisms capable of ensuring a balance between the effectiveness of algorithms and compliance with constitutional rights is a key challenge of modern public and legal thought.

AI regulation and national security

AI is transforming national security in many ways, creating both opportunities and risks. It can protect countries from cyber threats, make military operations more accurate, and improve decision-making. But it can also spread misinformation, invade privacy, or lead to critical errors. As AI becomes more prevalent in security, a balance must be struck between harnessing its potential for good and controlling its dangers. This means that countries must work together and establish clear rules for the use of AI.

By 2025, there were more regulations than working models in the world of AI. The world is currently divided into three camps on AI regulation:

1. Europe: a tough regulatory model. The AI Act requires risk assessments and audits of "high-risk systems", including LLMs. Companies must conduct adversarial testing and document the results. The European AI Act, adopted in 2024, is the world's first comprehensive set of AI regulations. The document introduces a risk-based approach, categorising AI systems according to the risk level. The fine system is modelled after the GDPR and provides for serious sanctions (Jermsittiparsert *et al.*, 2025): up to €35 million or 7% of global annual turnover (whichever is greater) for the use of prohibited AI systems; up to €15 million or 3% of turnover for violating the requirements for high-risk systems; up to €7.5 million or 1.5% of turnover for providing incorrect information to the regulator.

The AI Act is a large and complex document, its requirements are extensive, so it comes into force and begins to be applied in several stages. In general, the law comes into force on August 2, 2026, at which time enforcement authorities will be able to start applying sanctions, and by that time national authorities must create at least one regulatory "sandbox" for AI. The AI Act introduces special requirements for two categories of systems:

- high-risk systems are AI applications used in critical areas: biometric identification, critical infrastructure management, education, employment, law enforcement;
- GPAI (General Purpose AI) models are general-purpose models, including large language models (LLM) and highly specialised LLM fine-tuning.

2. The AI governance model in Ukraine is driven by strategy, not legislation. The National AI Development Strategy (Order of the Cabinet of Ministers of Ukraine No. 1556-r, 2020) functions as a policy and coordination tool that guides regulators, public authorities, and private actors toward responsible AI development while supporting innovation and digital resilience. The strategy reflects two parallel national priorities: accelerating AI-based innovation in government, defence, justice, and the private sector; and protecting democratic values, human rights, and information security, especially in a high-threat environment. This dual focus made Ukraine one of the most explicit Eastern European jurisdictions in integrating ethical and security considerations directly into AI policymaking. The National Strategy sets out goals, implementation principles, and sectoral priorities rather than enforceable commitments. The AI Development Strategy in Ukraine prioritises: responsible development of AI in public administration, defence, healthcare, education, and business; protection of human rights in automated and algorithmic decision-making; transparency and accountability in high-performance AI systems; combating disinformation, cybersecurity, and information integrity; developing national expertise in AI and technological resilience.

3. National Security Memorandum 25 (2024) is the first document of this level that systematically outlines the commitments of the US national security community to use AI to support democratic values. At the same time, AI regulation in the US remains decentralised and is characterised by the lack of a single comprehensive federal law: despite the presence of strategic documents, in particular Executive Order 14110 (2023), a significant part of regulatory requirements is formed at the state level, which leads to fragmentation of the legal environment. In this context, standardisation initiatives play an important role, in particular the AI Risk Management Framework: Generative AI Profile (NIST, 2024). The document focuses on generative AI (GenAI) systems and offers a practical framework for risk management throughout the entire life cycle of models. Despite its voluntary nature, this profile is already considered a reference point for the formation of compliance standards and the further development of regulatory regulation in the USA.

4. Asia and the Middle East are creating an approach. As the OECD report (2024) shows, the UAE, Saudi Arabia, Singapore, and China have "codes of ethics", where the security and clarity of the model are still more important than formal penalties. Middle Eastern countries are guided by the experience of Europe and the USA and are creating loyal regulations for business, China is creating its standards independently. The Chinese approach is characterised by a strong emphasis on content control and national security. Regulators require AI systems not to generate content that could "undermine state power" or "disturb public order". The ethical setting of China's Open Source models is therefore quite specific: these models will respond with a refusal to provocative questions about the Cultural Revolution, but openly generate text on questions that are not directly related to China (Arya & Shroff, 2025).

In general, the regulation of AI for national security purposes aims to exploit the defensive advantages of AI while reducing the risks associated with autonomous weapons, cyberattacks, and foreign manipulation. Key approaches include integrating AI into defence, protecting data, and establishing ethical principles to prevent an arms race associated with the use of AI. As countries seek to regulate AI, the national security implications of these regulatory frameworks are becoming increasingly important.

The impact of AI on the architecture of law

In addition, AI is fundamentally changing the architecture of law, transforming it from a labour-intensive, input-driven process to a faster, technology-enabled, data-driven function. This transformation involves empowering humans with generative AI and advanced analytics to automate routine tasks, improve decision-making, and reimagine the delivery of legal services. AI is transforming the architecture of lawmaking from a traditionally slow, manual, and document-intensive process to an agile, data-driven, and often automated lifecycle. Using machine learning, natural language processing (NLP), and LLM, parliaments and governments are automating the routine development of legislation, analysing the impact of proposed laws in real time, and identifying gaps or inconsistencies in existing regulations. At the same time, critical challenges are also emerging. Key architectural changes in lawmaking are outlined in Table 3.

Table 3. *Key architectural changes in the legislative process in the context of AI*

Key changes
From manual drafting to AI-powered generation. AI is increasingly being used to draft legislation, resolutions, and amendments. For example, the United Arab Emirates plans to use AI to write laws, aiming to increase speed by 70%, while Albania is using AI to align its national legislation with EU standards. In 2023, California and Costa Rica introduced resolutions/bills drafted using ChatGPT
Predictive policy impact analysis. Instead of waiting until after enactment, AI models potential outcomes, allowing lawmakers to analyse the economic, social or environmental impact of proposed laws before the adoption
Automated legal consistency checks. AI algorithms compare new draft laws with thousands of existing ones to automatically identify potential conflicts, inconsistencies, or legal duplications
Rules as Code (RaC) integration. There is a movement towards developing "computer-readable" legislation (e.g. using L4 or Blawx), which allows laws to be encoded as logically driven systems that computers can interpret for faster enforcement and compliance
Moving to "adapt and learn" regulation: AI facilitates the transition from "regulate and forget" to "adapt and learn" by providing continuous monitoring and revision of laws based on real-time data
Improved public consultation and sentiment analysis: AI tools analyse vast amounts of public statements and sentiment on social media, allowing lawmakers to quickly gauge public opinion on specific provisions or topics
Risks and challenges of the new architecture
"Legislative DDoS". The potential for using AI to overload consultation processes with huge volumes of automated, uniform submissions
Hallucinations and reliability: AI models can create false court cases or precedents that require strict human oversight
Transparency and accountability. The "black box" in AI decisions makes it difficult to track how specific, potentially biased wording got into the project
Shift from human to machine control. There is a risk of diminishing the role of legislative staff and elected members in making crucial decisions, shifting responsibility to technologists

Source: *created by the authors based on G. Hill et al. (2025), J.A. Rabanos & B. Spaić (2025)*

Overall, regulating AI at the national level is a 21st century challenge with no simple precedent. Unlike the last technological revolutions, AI is evolving at an unprecedented pace, penetrating virtually every sector, blurring traditional boundaries. Nation states must be proactive and agile in the responses. To succeed, regulators will need to embrace adaptive learning (much like AI itself). This means constantly updating rules based on real-world outcomes, collaborating across countries, and engaging experts from multiple disciplines. The most effective AI governance is likely to be those rules and regulations that can be clearly explained and justified to both the engineer and the average citizen.

Based on the results of the analysis, a number of possible directions for further development were identified to ensure the optimal use of AI in public administration:

- development of a strategy for the use of AI in public administration, which would determine, among other things, the goals and objectives of regulation, as well as describe existing challenges and threats;
- in order to ensure information security, determining the permissible limits of the use of foreign-made AI systems in public administration, excluding the possibility of dependence of significant administrative processes and decisions on foreign manufacturers (elements of such a practice exist in the Five Eyes Alliance). One of the possible solutions may also be the creation of a register of domestic AI systems, which can be a criterion during public procurement or selection for receiving state support measures;
- making decisions on consolidating legislative norms in the field of AI, mainly based on the results of an analysis of the practice of the application on the basis of experimental legal regimes and projects implemented within the framework of these regimes;
- development of state standards in the field of state and municipal administration by analogy with the adopted and current standards in the fields of healthcare, education, transport and other industries.

The results obtained confirm that the integration of AI into the public administration system is not only a technological, but primarily an institutional and legal process, which is accompanied by significant transformations of management practices. It was established that the use of AI contributes to increasing the efficiency of decision-making, expanding the analytical capabilities of government agencies and the transition to predictive management models.

These results are consistent with the conclusions of A. Aarab *et al.* (2025), who note that the implementation of AI allows for increasing the speed and transparency of state processes, however, the effectiveness of its use is limited by institutional readiness and data quality.

At the same time, the results of the study confirm that the key limitation of AI implementation is not technological, but organisational and regulatory factors. The identified problems of data fragmentation, lack of unified standards and insufficient level of digital competencies correlate with the results of systematic reviews in the field of AI governance (Batool *et al.*, 2025), which emphasise the need for a comprehensive approach to managing digital transformations. This indicates that the effectiveness of AI is determined not only by the level of technology development, but also by the coherence of the institutional environment. Special attention should be paid to the transformation of the nature of the management decision. The results of the study demonstrate a gradual transition from an anthropocentric decision-making model to a hybrid one, in which algorithmic systems act as full participants in the analytical process. This is consistent with the approach of Y.-C. Chen *et al.* (2023), who emphasise that the impact of AI goes beyond technical automation and affects fundamental public values, in particular transparency, accountability and justice.

At the same time, the results confirm the presence of significant risks associated with the use of AI in the public sector. In particular, the problems of the "black box", the possibility of algorithmic discrimination and the risks of data leakage identified in the study coincide with the conclusions of A.F. Vatamanu & M. Tofan (2025), which point out the vulnerability of human rights in the context of automated decision-making. This highlights the need to form effective mechanisms for monitoring and auditing algorithmic systems. At the macro level, the results of the study confirm the trend towards the formation of multi-level models of AI regulation, combining international recommendations, national strategies and sectoral regulations. A similar approach is reflected in OECD reports (2024), which underline that the readiness of states to implement AI depends on the ability to integrate technological, legal and ethical aspects into a single management system. At the same time, the fragmentation of regulatory approaches identified in the study indicates the absence of a unified global model of AI governance.

In addition, the results showed that the development of AI changes not only management practices, but also the architecture of law, in particular the processes of rulemaking. The identified trends towards the automation of legislative activity, the use of predictive analytics and the transition to adaptive regulation are consistent with the conclusions of G. Hill *et al.* (2025), who consider generative AI as a tool for optimising the lawmaking process. At the same time, this creates new challenges related to the responsibility, reliability, and legitimacy of such decisions. In general, the results of the study indicate that the implementation of AI in public administration has a dual nature: on the one hand, it creates significant opportunities for increasing the effectiveness of public policy, and on the other, it generates a set of new risks and legal uncertainties. This requires a transition to an integrated model of AI management that combines technological development with institutional adaptation and legal regulation.

Conclusions

The article provides a comprehensive analysis of the transformation of public administration tools under the influence of AI, taking into account the interdisciplinary combination of legal, managerial and technological approaches. The generalisation of the results obtained in different segments of the study made it possible to form a holistic vision of the role of AI as a systemic factor in the modernisation of public policy. It is established that the introduction of AI changes the functional nature of public administration, causing a transition from traditional administrative models to data-oriented, algorithmically supported forms of decision-making. Such transformations are accompanied by an increase in the efficiency, speed and analytical validity of public policy, which is confirmed by the results of the analysis of international practices and cases. At the same time, it is proven that the digitalisation of management based on AI generates a set of new risks, including algorithmic bias, opacity of decision-making, a decrease in the level of accountability and potential threats to national security. This necessitates a rethinking of the role of law as a tool not only for regulation, but also for strategic management of technological processes.

Based on the application of the grounded theory method, a conceptual position was formed that the legal regulation of AI is a key driver for increasing the effectiveness of public policy, provided that it is integrated with institutional practices and technological infrastructure. It was established that the most relevant are risk-oriented and adaptive regulatory models that provide a balance between innovation, security, and respect for human rights. The results of the case study confirm that the effectiveness of the use of AI in public administration largely depends on the quality of the legal environment, the level of institutional capacity and the availability of control mechanisms, such as algorithm auditing, impact assessment and ensuring transparency.

It is substantiated that the modernisation of public administration tools in the context of the development of AI requires the formation of a new paradigm of legal regulation, characterised by proactivity, flexibility and cross-sectoral integration. Such a paradigm should take into account the dynamic nature of technological change, ensure effective risk management, and contribute to the achievement of sustainable development goals. Prospects for further research are related to deepening the theoretical understanding of algorithmic governance, developing institutional models of responsibility for decisions made with the use of AI, and also to the formation of universal

approaches to international legal regulation of AI in the face of global challenges.

Acknowledgements

None.

Funding

None.

Conflict of Interest

None.

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Модернізація інструментарію публічного управління: правове регулювання ШІ як фактор підвищення ефективності державної політики

Сандіп Кумар Гупта
Доктор філософії, професор
Університет Моханбабу
517102, вул. Sree Vidyanikethan, Sree Sainath Nagar, м. Тірупаті, Індія
https://orcid.org/0000-0002-2670-2858
Соломія Ганущин
Доктор наук з державного управління, доцент
Львівський національний університет ветеринарної медицини
та біотехнологій імені Степана Гжицького
79010, вул. Пекарська, 50, м. Львів, Україна
https://orcid.org/0000-0002-6328-9978
Андрій Зарічняк
Кандидат економічних наук, доцент
Карпатський національний університет імені Василя Стефаника
76018, вул. Шевченка, 57, м. Івано-Франківськ, Україна
https://orcid.org/0000-0001-7191-6583
Людмила Акімова
Доктор наук з державного управління, професор
Кіпрський технологічний університет
3036, вул. Архієпископа Кіпріана, 30, м. Лімасол, Кіпр
Національний університет водного господарства та природокористування
33028, вул. Соборна, 11, м. Рівне, Україна
https://orcid.org/0000-0002-2747-2775
Олександр Акімов
Доктор наук з державного управління, професор
Міжрегіональна академія управління персоналом
03039, вул. Фрометівська, 2, м. Київ, Україна
Науково-методичний центр кадрової політики Міністерства оборони України
03113, просп. Берестейський, 55/2, м. Київ, Україна
https://orcid.org/0000-0002-9557-2276

Анотація. Стаття фокусується на зміні інструментарію державної політики під впливом штучного інтелекту. Метою дослідження була концептуалізація ролі правових механізмів у трансформації управлінських процесів та формуванні нових моделей взаємодії між державою, технологіями та суспільством. Методологічною основою дослідження є якісний підхід, що ґрунтується на policy-аналізі з використанням елементів кейс-стаді та порівняльного аналізу. Такий підхід дозволив виявити ключові закономірності взаємодії правового регулювання, інституційних практик та застосування інтелектуальних систем у публічному управлінні. В роботі проаналізовано вплив впровадження інтелектуальних рішень у виконавчу та законодавчу владу на архітектуру права та стандарти ефективного управління. Розглянуто міжнародний досвід правового забезпечення національної безпеки в умовах цифрової автономії систем. Визначено стратегічні напрями оновлення публічного управління для забезпечення соціальної справедливості та екологічної стійкості. У результаті дослідження встановлено, що впровадження штучного інтелекту (ШІ) сприяє трансформації архітектури права, формуванню алгоритмічних форм управління та переходу до адаптивних, ризик-орієнтованих моделей регулювання. Доведено, що ефективне правове регулювання ШІ забезпечує підвищення прозорості, підзвітності та якості управлінських рішень, а також мінімізує ризики, пов'язані з використанням алгоритмічних систем. Запропоновано розглядати правове регулювання ШІ не лише як реакцію на технологічні виклики, але як проактивний механізм формування інноваційно орієнтованої, соціально відповідальної та безпечної моделі державного управління. Результати дослідження можуть бути використані для розробки ефективних стратегій цифрової трансформації публічного управління та вдосконалення правових засад регулювання штучного інтелекту

Ключові слова: право, інструментарій; сталий розвиток; ефективне управління; національна безпека

DEMOCRATIC GOVERNANCE
Vol. 19, No. 1, 2026, 59-69
Journal homepage: https://d-governance.com.ua/
Received: 30.12.2025; Revised: 27.03.2026; Accepted: 28.05.2026; Published: 25.06.2026

UDC 351.741:327(477)
DOI: 10.56318/dg/1.2026.59

E-ISSN 2070-4038

Institutional modernisation of public administration as a prerequisite for Ukraine's European integration

Vitalii Bashtannyk*
Doctor of Public Administration, Professor
Dnipro University of Technology
49005, 19 Dmytra Yavornytskoho Ave., Dnipro, Ukraine
https://orcid.org/0000-0001-5969-3620

Adel Bykova
PhD in Economics, Associate Professor
University of Customs and Finance
49000, 2/4 Volodymyra Vernadskogo Str., Dnipro, Ukraine
https://orcid.org/0000-0001-7290-9094

Mykola Popov
Doctor of Public Administration, Professor
Odesa National Polytechnic University
65044, 1 T. Shevchenko Ave., Odesa, Ukraine
https://orcid.org/0000-0003-0204-1810

Oksana Bashtannyk
Doctor of Public Administration, Professor
Dnipro University of Technology
49005, 19 Dmytra Yavornytskoho Ave., Dnipro, Ukraine
https://orcid.org/0000-0003-4067-3261

Petro Garasyim
Doctor of Economics, Professor
Ukrainian National Forestry University
79057, 103 Heneral Chuprynka Str., Lviv, Ukraine
https://orcid.org/0000-0001-5282-8799

Abstract. The study analyses the transformation of institutional quality in the context of Ukraine's acquisition of candidate status for accession to the EU. Particular attention was given to the harmonisation of national law with European standards, namely the *acquis communautaire*, especially in the areas of transparency and accountability of public authorities. The article examined mechanisms for modernising the state apparatus aimed at creating flexible institutional structures capable of implementing reforms effectively. It was emphasised that the stability and effectiveness of the institutions are the key factors that determine the successful negotiation process regarding EU membership. The methodological basis of the study was a qualitative approach using the tools of grounded theory, which made it possible to systematise the key factors of institutional modernisation and identify the relationships between them. The article proposed a conceptual model, the Institutional Modernisation Framework, which reflects the interaction between reform drivers, modernisation mechanisms, the institutional capacity of public authorities and the outcomes of transformation in the public administration system. Special attention was paid to Croatia's experience of modernising public administration during the process of accession to the European Union, which helps to identify potential challenges and opportunities for Ukraine. It was demonstrated that effective institutional modernisation requires an integrated approach that includes legal adaptation to EU standards, the development of human capital in the civil service, the digitalisation of governance

Suggested Citation:
Bashtannyk, V., Bykova, A., Popov, M., Bashtannyk, O., & Garasyim, P. (2026). Institutional modernisation of public administration as a prerequisite for Ukraine's European integration. *Democratic Governance*, 19(1), 59-69. doi: 10.56318/dg/1.2026.59.

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**Corresponding author (Bashtannyk_V.V@nmu.one)*

and the strengthening of local self-government. The study concluded that the institutional modernisation of public administration based on the concept of Europeanisation is a key prerequisite for Ukraine's successful integration into the European governance space and for ensuring the sustainable development of the state. Drawing on the combination of the Institutional Modernisation Framework and Gartner's governance maturity model, the article proposes an integrated model of institutional maturity in public administration

Keywords: human capital; institutional quality; local self-government; Europeanisation; institutional maturity

Introduction

Ukraine's European integration is one of the key strategic priorities of state policy and determines the direction of the country's institutional, political and socio-economic transformations. After Ukraine obtained candidate status for membership in the European Union in 2022, the issue of the compliance of national institutions with European standards became particularly significant. In this context, the institutional modernisation of the public administration system is regarded as a fundamental prerequisite for the effective implementation of reforms, the harmonisation of legislation and the sustainable development of the state.

A review of the literature on the role of institutions and the effectiveness of public administration in European integration processes shows the complexity and multidimensional nature of the issues under study. J. Wankiewicz (2024) examined the practice of European integration in Central and Eastern European countries and noted that the success of this process depends to a considerable extent on institutional quality, the effectiveness of public administration and the capacity of the state apparatus to implement complex transformational reforms. The author concluded that the ultimate aim of modernisation is to ensure the ability of public administration to fulfil the obligations of membership, including the effective management of the European Structural and Investment Funds (ESIF) and participation in the European Semester.

In the academic literature, institutions are usually defined as formal and informal rules that structure political, economic and social interaction in society, creating the conditions for the functioning of public administration and the implementation of public policy (Sherbak, 2016). P. Dinesen & K. Sønderskov (2021) emphasised in their research that institutional quality has a direct impact on the effectiveness of governance, the level of public trust in authorities and the state's ability to uphold the rule of law. These findings indicate that institutional capacity is a fundamental factor in the stability and effectiveness of public administration. Research results in the field of human capital management in security and defence, which have been obtained by J. Bashtannyk *et al.* (2025), examined new practices of personnel management and human resource management in the public sector. The authors indicated that the introduction of modern approaches to human capital development, including training, motivation and competence assessment, makes it possible to improve the effectiveness of public institutions performing critically important functions. It follows from the data that without a systematic process of managing human capital, the prepared structures will not be able to ensure a high level of efficiency in performing national security tasks despite their technical and organisational readiness.

Another point of view is reflected in the research by O. Bashtannyk *et al.* (2024), in which they examine the introduction of digitalisation tools into the sphere of public administration and the effects of national security and economy by using spatial planning tools. According to the authors, digital technologies provide a more effective data analysis, efficient use of resources, and rapid responses to external challenges. This led to the following conclusions: digitalisation of the administrative apparatus contributes not only to accelerating the decision-making process but also to strengthening the strategic potential of public authorities in terms of security and economic development.

Not all studies touch upon the issue of adaptation of national legislation with the laws of the European Union (*acquis communautaire*) as it relates to Ukraine's integration. As S. Busetti & C. Pacchi (2015) note, the effectiveness of implementing European norms depends to a large extent on the institutional capacity of public authorities and the level of administrative reform. This research perspective also shaped their conclusions, which concerned the need to transform institutional mechanisms and managerial decision-making procedures, as well as to increase the transparency and accountability of public authorities.

A particular role in the modernisation of the public administration system is played by the development of human capital in the civil service, the improvement of strategic planning and the enhancement of the professional competence of civil servants. J. Addink (2019) examined the formation of effective institutions and noted that they emerge not only through regulatory changes but also through the development of administrative culture, the professionalisation of the civil service and the implementation of the principles of good governance. The author concluded that, without the proper development of human capital and administrative practices, even formally effective institutions do not ensure a high level of public administration performance.

Thus, recent studies confirm that the integration capacity of European states, including Ukraine, is determined by the synergistic interaction of high-quality institutions, effective governance and human capital development, which together ensure the ability to implement complex transformational reforms and fulfil international obligations. In addition, an important area of institutional modernisation is the development of local self-government and decentralisation processes, which

help to improve governance effectiveness at the regional and local levels. Strengthening the role of territorial communities in the formulation and implementation of public policy corresponds to the European principles of subsidiarity and multi-level governance, which are characteristic features of the modern governance system in the European Union. The institutional modernisation of the public administration system is a key factor in Ukraine's successful integration into the European Union, as it ensures the formation of effective mechanisms for implementing reforms, improving the quality of public administration and strengthening democratic institutions. In this context, the study of the transformation of the institutional structure of public administration is of considerable scholarly and practical significance. Accordingly, this study aimed to identify the specific features of the institutional modernisation of Ukraine's public administration system in the context of European integration, and to analyse the key areas for improving institutional quality and their role in ensuring an effective negotiation process regarding Ukraine's membership of the European Union.

Materials and Methods

To achieve the stated aim, the article employs a qualitative research approach that combines analysis of the institutional transformations of Ukraine's public administration system with theoretical inquiry. This approach makes it possible to identify the key patterns of institutional modernisation and to formulate theoretical generalisations based on a systematic analysis of the data. The application of grounded theory in this study made it possible to systematise the key factors of institutional modernisation and identify their interrelationships in the context of Ukraine's European integration (Table 1).

Table 1. *Open, axial and selective coding in the research process using grounded theory tools*

Data fragment/indicator	Open coding	Axial coding	Conceptual category
Harmonisation of national legislation with the *acquis communautaire*	Legislative adaptation	Legal integration	European integration
Implementation of EU standards in public administration	Implementation of EU norms	Administrative adaptation	European integration
Transparency in the activities of public authorities	Governance transparency	Good governance mechanisms	Institutional quality
Accountability of public authorities to society	Accountability	Democratic control	Institutional quality
Development of egovernment	Digitalisation of governance	Innovation in governance	Governance modernisation
Anti-corruption institutions and policies	Anti-corruption mechanisms	Combating corruption	Institutional effectiveness
Civil service reform	Professionalisation of the civil service	Development of personnel capacity	Human capital
Advanced training for civil servants	Professional development	Managerial competences	Human capital
Strategic management	Managerial tools	Governance modernisation	Governance modernisation
Reform of budgetary management	Financial transparency	Effectiveness of public finance	Institutional effectiveness
Decentralisation of power	Transfer of powers	Multi-level governance	Local self-government
Financial autonomy of communities	Budgetary autonomy	Financial decentralisation	Local self-government
Citizen involvement in decision-making	Public participation	Participatory governance	Democratic governance
Partnership between the state and civil society	Interaction between the state and NGOs	Social dialogue	Democratic governance
Development of the institutional capacity of public authorities	Institutional capacity	Administrative effectiveness	Institutional modernisation
Coordination of reforms between public authorities	Inter-institutional coordination	Managerial integration	Institutional modernisation
Use of international governance standards	International practices	Policy transfer	European integration
Increasing public trust in the state	Institutional trust	Social legitimacy	Institutional quality
Monitoring and evaluation of public policy	Policy evaluation	Evidence-based policy	Governance modernisation
Resilience of state institutions under crisis conditions	Institutional resilience	Adaptive governance	Institutional modernisation

Source: *compiled by the authors*

To ensure the scholarly reliability of the research findings, the study applied the principle of source triangulation, which involves the analysis of different types of data. Second, a comparative analysis of the coding results was conducted to identify recurring conceptual categories, which strengthened the validity of the theoretical conclusions. Third, the findings were correlated with existing theoretical approaches to the study of institutional modernisation and public administration. Thus, the use of grounded theory methodology made it possible to develop

a systematic understanding of the processes of institutional modernisation in Ukraine's public administration and to identify the key factors influencing the effectiveness of European integration.

Results and Discussion

Conceptual modelling. Based on the coding conducted, a conceptual model of the institutional modernisation of public administration was developed. The model explains the relationship between the key factors involved in reforming state institutions during the process of European integration. The Institutional Modernisation Framework consists of four interrelated structural blocks:

1. Institutional drivers of reform. This block reflects the external and internal factors that stimulate the modernisation of public administration. These include European integration and adaptation to EU standards; implementation of the *acquis communautaire*; international recommendations and good governance standards; and the need to improve the effectiveness of public administration.

2. Mechanisms of institutional modernisation. The second block of the model includes the main instruments for transforming the public administration system: administrative reforms; digitalisation of public administration; anti-corruption mechanisms; civil service reform; the development of strategic planning; and the implementation of evidence-based policy.

3. Institutional capacity. The third block of the model reflects the internal characteristics of institutions that determine their effectiveness: professionalisation of the civil service; human capital development; inter-institutional coordination; managerial competences; and organisational adaptability.

4. Outcomes of institutional modernisation. The outcomes of the model include improved institutional quality; stronger democratic governance; increased public trust in the authorities; the effective functioning of local self-government; and Ukraine's successful integration into the European governance space.

Thus, the model shows that the institutional modernisation of public administration is a multidimensional process involving the interaction of regulatory reforms, organisational transformations and human capital development. The systematic implementation of these components creates the conditions for improving the effectiveness of public administration and ensuring Ukraine's successful progress towards European integration. Institutional modernisation of public administration is understood as involving the restructuring of public authorities, the reform of human resources and the introduction of digital technologies to improve the efficiency and transparency of service delivery (Guogis *et al.*, 2024). The key areas of activity include digital transformation, such as e-governance and blockchain, SMART bureaucracy and the introduction of neo-Weberian models to balance stability and innovation (Table 2).

Table 2. *Key aspects of institutional modernisation*

Aspect	Content
Digital transformation	Introduction of digital platforms, such as Diia, and blockchain technologies to increase transparency, improve the business climate and reduce corruption
SMART bureaucracy	Transition to analytical, professional and ethical administrative structures that combine regulatory harmonisation with digital openness
Human resource management	Reform of the civil service with an emphasis on career progression, professional development and the alignment of human resources with contemporary European standards
Institutional re-engineering	Strengthening regional and central institutions to improve service delivery and stimulate economic development
Democratic governance	Expanding public participation in decision-making and ensuring the accountability of public institutions

Source: *developed by the authors based on M. Andrews (2013), H. Ali & S. Bhulyan (2022)*

Institutional modernisation of public administration is a continuous process of renewing the system of public authorities, their functions, norms and procedures in order to align them with contemporary requirements, technologies and social needs. The main areas of research in this field include the optimisation of governance structures, debureaucratisation, the introduction of digital technologies, including e-government, improved interaction between public authorities and society, and the legal support of administrative reforms. Theoretical research under conditions of contemporary change is directed towards identifying the optimal relationship between political objectives and the mechanisms for achieving them. This includes analysis of possible ways to achieve coherence between political strategy and administrative tools, such as project-based, process-based and network-based approaches. At the same time, administrative reforms actively implemented both in developed economies and in developing countries show the ambiguous nature of institutional change. In particular, it has become clear that innovations often encounter resistance because of attempts to preserve the status quo or pursue alternative agendas. This may lead to institutional traps that slow the course of reforms or even call their legitimacy into question in public opinion (Finocchiaro Castro *et al.*, 2025).

In a context of institutional uncertainty, where political responsibility and administrative accountability become blurred, the risk of rent-seeking behaviour among senior officials increases. Public office is increasingly used as an instrument for obtaining excessive gains, while corruption acquires the features of a systemic phenomenon. Under

such conditions, the main challenges are the political interests of those who should initiate reforms and the administrative capacity of the apparatus to implement what has been planned. The postponement of strategically important reforms deepens the crisis of public administration. Although such a crisis may potentially serve as an impulse for change, it is unlikely to be overcome without effective political and administrative institutions. These institutions must be integrated into a multi-level system for determining priorities and incentives for the key participants in the governance process, from the highest political leaders and influential business figures to regional and local officials, as well as citizens as recipients of public services.

Taken together, this confirms the topicality and practical relevance of studying political and administrative institutions. Such a study is necessary for formulating the strategic objectives of modernisation and examining the extent to which they are linked to available resources; for identifying the set of institutions, namely the rules, procedures, powers and motivational mechanisms required to achieve the desired outcomes; and for analysing the main actors involved in modernisation. Research in these areas is widely represented in the specialised literature (Addink, 2013; Jinhua, 2022; Ibrahim *et al.*, 2024). Moreover, the research focus is gradually shifting from the description of foreign experience as a model to be emulated towards the substantiation of domestic socio-cultural trends and governance models. For instance, in his recent study, A. Rachynskyi (2025) emphasises that the Europeanisation of the Ukrainian bureaucracy is not just the process of importing EU regulatory practices. It requires profound changes in cultural values and administrative thinking, the creation of a new ethics of service, and a reconsideration of the role of the civil servant, who should be not only an executor of procedures but also an active agent of development. At the same time, the author highlights that this process is contradictory, which is manifested in the interaction between technological innovations and institutional inertia, giving rise to the phenomenon of "electronic bureaucracy with an analogue mindset". In response to these problems, the author offers the concept of SMART Bureaucracy – 2030, which will become the vector of the next transformations. This implies combining legal security with digital analytics, professionalism with trust, and technological efficiency with the humanistic values of public service. Such a model will enable the transformation of bureaucracy from a traditional administrative body into an intelligent system for learning, forecasting and adaptation. A separate focus on the regional dimension of the European integration of Ukraine in the research of L. Lukashuk (2023) is given to the analysis of the regulatory and legal framework for the functioning of public mechanisms, which is relevant to the conditions of regional heterogeneity and the diversity of the country's cultural and identity space.

The *acquis communautaire* and national specificities of harmonisation. Reforming the procedures for developing and implementing public administration institutions should take into account the political and administrative structure of the system, the level of political competition, the quality of mechanisms that compel officials to comply with administrative rules, and the effectiveness of accountability instruments. With clear and working modernisation institutions, it is possible to actively influence the real behavioural models of civil servants and public organisations' activities in social practice (Khan *et al.*, 2019). Public administration modernisation means creating an institutional building programme, which implies creating an administrative system with a clearly defined division of powers and responsibility for their performance, a motivational system oriented to the value system of the time, the elements relating to the administrative capacity of the public sector and those relating to the development of policy of public administration reform. Such an institutional-building programme reflects the level of modernisation capacity in public administration, which depends on the administrative capacity of the state and its "ability to formulate and implement policy" (Liu, 2019).

The development of a programme for institutional building and the modernisation of public administration is associated with the use of neo-institutional methodology, which is becoming increasingly widespread in political science and other social sciences. This methodology includes historical neo-institutionalism, sociological neo-institutionalism and rational choice neoinstitutionalism (Kud, 2022). The current theoretical and methodological potential of neoinstitutional analysis makes it possible to formulate conceptual approaches to the study of the modernisation of public administration.

The renewed interest in institutions in political science has been accompanied by an expansion of the research field of institutional theory. "Old" institutionalism focused mainly on the formal institutions of the state, including executive and legislative bodies, courts and laws, and was criticised for paying excessive attention to normative issues, particularly constitutional and legal structures, compared with the actual behaviour of actors in the political process and its consequences. "New" institutionalism treats phenomena covered by broad concepts, such as interest representation and even political consciousness, as institutions in accordance with a broad understanding of the term (Bodnieks, 2020).

The relationship between institutional transformations and political modernisation was once convincingly demonstrated by Samuel Huntington (Bayramova, 2024). In this regard, the political strategy for the modernisation of public administration may be regarded as a form of institutional design, shaped on the basis of political objectives, attentive to the interests of different social groups and implemented through a system of norms. The formation of such a strategy includes not only the theoretical justification of mechanisms of institutional change, namely trajectories of institutional development within the governance system, but also an analysis of the processes that determine the institutional rules for strategic decision-making.

Increasing influence of the state requires giving up the dominance of such modernisation logics as rational construction and environmental determinism, and to reveal the process by which the existing institutions mediated political action changes the main features of public administration, and to identify the mechanisms that allow understanding the influence of the existing institutional order on the process of change dynamics and which elements of this mechanism play a leading role. It is equally important to study institutional dynamics, including deliberate institutional building, selfregulating transformations and institutional transplantation, as well as their direction, different trajectories of change and consequences for public administration. The approaches developed within modernisation theory are not always adequate to the realities of economic and political processes and are often fragmentary. These approaches often interpret the linear political and administrative processes of the traditional cause-and-effect relationships without paying attention to their multi-level institutional nature.

This is particularly evident in the study by D. Tkach & T. Kazik (2020), who emphasise that, if the concept of the *acquis* is dynamic and constantly expanding, the adaptation of Ukrainian legislation in all areas required for the country to be considered a candidate for EU membership will take a considerable amount of time. Thus, the legislative process in Ukraine will not be able to keep pace with the EU acquis, which will become a significant obstacle to the country's European integration. Also, the authors emphasised the need to know fully the meaning of all acts of the *acquis* to harmonise Ukrainian legislation. It implies that cooperation with European experts should be close, because in case of misreading, this will negatively affect the implementation of these measures in the process of adaptation.

A retrospective view of Croatian modernisation. Institutional modernisation of public administration of Croatia was a crucially important and essential transformational process that mainly had to be implemented due to compliance with the requirements and *acquis communautaire* in the EU accession process in 2005-2011 and membership in 2013. The institutional modernisation of public administration in Croatia was an integral part of the European Union accession process and aimed to bring Croatia's administrative system in line with the *acquis communautaire* for the effective application of EU standards. The main driving force of this process was the influence of the EU conditionality, which emphasised the importance of developing capacities, the rule of law and transition from a centralised, legalistic bureaucracy to a modern, service-oriented administration. The main elements of the institutional environment of the modernisation of public administration of Croatia in the accession process to the EU are presented in Table 3.

Table 3. *Key aspects and challenges of institutional modernisation in Croatia during the EU accession process*

Key aspect	
Europeanisation phase after 2001	After the signing of the Stabilisation and Association Agreement in 2001, Croatia entered a phase of intensive reforms, culminating in the 2008 Public Administration Reform Strategy, which focused on modernisation and adaptation to EU standards
Institutional capacity building	A key task was to strengthen administrative capacity for managing EU funds and implementing legislation across the 35 negotiation chapters. This included the creation of independent inspectorates, the strengthening of financial control systems and the enhancement of judicial independence
Establishment of new agencies	Modernisation included the creation of independent environmental agencies, inspectorates and specialised regulatory bodies to meet EU requirements for effective and professional governance
Digitalisation and e-government	Significant investment was made in digital tools and e-government solutions, such as e-Citizens and the state information infrastructure, to improve efficiency and reduce bureaucracy in line with EU digital standards
Legislative alignment	The government established a specialised structure for adopting the *acquis communautaire*, preparing annual national programmes for incorporating EU legislation into the national regulatory framework
Modernisation initiatives	Reforms were aimed at creating a citizen-oriented administration, increasing transparency, advancing digitalisation through e-government and improving the professionalism of civil servants
Regional development framework	The creation of structures for the effective management of the European Structural and Investment Funds (ESIF) became a key component of institutional reform
Challenge and outcome	
Slow modernisation	Despite reforms, the process was often characterised as "slow modernisation", marked by structural resistance within the bureaucracy and a high degree of administrative fragmentation. Modernisation efforts included attempts to streamline local and regional self-government, which was considered highly fragmented
Improved effectiveness	After accession, Croatia showed an improvement in government effectiveness, from 0.46 in 2019 to 0.58 in 2022, although it remained below the EU-27 average
Technical support	After accession, Croatia continued to use the EU Technical Support Instrument (TSI) to implement more than 138 reform projects, focusing on digitalisation and the efficiency of public expenditure
Regulatory Impact Assessment (RIA)	Croatia introduced a legal framework for RIA and stakeholder engagement, aligning it with OECD and EU practice in order to improve the quality of public regulation

Source: *developed by the authors based on studies by T. Cierco (2009) and P. Wankiewicz (2024)*

The main aim of modernisation was to build the capacity of the Croatian public administration in compliance with the obligations arising from membership, such as the effective implementation of the European Structural and Investment Funds (ESIF) and participation in the European semester (Wankiewicz, 2024). The EU played a fundamental role throughout this evolution. Acting as the main driver of change and reform, and offering models, recommendations and financial assistance for reconstruction, development and transition, the EU helped Croatia succeed in its transition process. A similar situation can be observed in Ukraine, which receives multilateral support, guidance and financial assistance from the EU as part of the accession negotiation process.

In fact, after 2003, the Croatian government was able to strengthen state institutions and ensure internal security more effectively than the previous centre-left government. However, it still fell short of expectations in its capacity to carry out macroeconomic reforms in areas such as the judiciary and to combat corruption, which remained deeply entrenched. These were, in essence, the two most difficult problems for Croatia's long-term democratisation, inherited from the processes of transition and state-building during wartime. They are also relevant to contemporary Ukraine.

The problematisation of the concept of Europeanisation in Croatia also deserves attention (Maldini & Pauković, 2017). As a concept, Europeanisation involves meeting membership criteria, including compliance with democratic standards such as respect for human rights and fundamental freedoms, the rule of law and economic performance. It also implies "the development of networks of interaction between domestic and supranational actors that can start and initiate a data-informed decision-making process" and "the gradual and differentiated diffusion of values, general norms and specific decisions, from European institutions and actors, into domestic politics, that is into the existing domestic institutions and into the political and public processes" (Morlino, 2002). Thus, with an emphasis on promoting stability through democratisation, institution-building and civic participation, Europeanisation is understood here as a process of constructing, disseminating and institutionalising formal and informal rules, procedures, policy paradigms, styles, "ways of doing things", and shared beliefs and norms that are first defined and consolidated in EU decision-making and then incorporated into the logic of domestic discourse, identities, political structures and public policy (Clemens, 2017).

The latter does not correspond to regionalisation since it involves socialisation and internalisation of the EU-conceived political and economic policy and security measures, and involves legal, institutional and structural adaptation. This process of deepening integration is embedded in the EU's accession criteria, as well as the European Neighbourhood Policy (ENP) that serves as a tool for harmonising practices conducive to cooperation between the EU, the candidate countries and the region, extending from the Mediterranean and through the Middle East to the Caucasus.

K. Sigrist (2008), an adviser to Romanian Prime Minister Adrian Năstase, highlighted two key points. Firstly, the reform process in Central and Eastern European states was sectoral and sequential and did not follow a systemic approach. Such a system would probably create institutional difficulties in the future and could potentially change the democratic status of these countries. On the other hand, L. Radu (2015) underlined that cultural aspects and historical inheritance could also be reasons for different results in reforms. Thus, Ukraine is not unique in the challenges it faces in the process of EU integration and the corresponding institutional modernisation of public administration. However, Europeanisation, as the concept described above, remains the only viable way to achieve success on the path towards EU membership.

Europeanisation: Opportunities and a pathway for Ukraine. As mentioned above, the Europeanisation of public administration is one of the key tools for institutional transformation of the countries striving to integrate into the European political and legal area. In the academic literature, Europeanisation is understood as a process through which national political and administrative institutions are transformed under the influence of the norms, principles and governance practices of the European Union. This process involves the gradual diffusion of European rules, standards and governance models within a state's domestic political and administrative system.

For Ukraine, Europeanisation of public administration was not just a political decision, and it is a vital condition for the sustainable development, democratic stability and effective functioning of state institutions. It covers extensive transformations from legislative approximation to the *acquis communautaire* to changes in administrative culture, the practice of decision making and the mechanisms of state-society interaction. One of the important factors for the successful Europeanisation is strengthening the state's institutional capacity. It is related to the development of professional career public service, the development of strategic planning capacity, the introduction of new digital technologies to the public sector governance, and the establishment of efficient mechanisms of interinstitutional coordination. In this context, an important area of reform is the digital transformation of public administration, which involves the development of e-government, open data and digital platforms for the provision of administrative services.

Moreover, Europeanisation is not just a mechanical adaptation of European institutional models. The experience of Central and Eastern European countries proves that the success of reforms is largely determined by the potential of national institutions to adapt European standards to their socio-political context. In this context, it is important to combine European principles of governance with national traditions of public administration and administrative culture.

Another important aspect of Europeanisation is the strengthening of the role of civil society in the formulation and implementation of public policy. Citizen participation

in managerial decisionmaking helps to increase the transparency of public administration, strengthen trust in state institutions and develop democratic governance practices. Hence, Europeanisation of Ukraine's public administration system can be considered as a holistic process of institutional change, which involves legal, organisational and cultural change. The implementation of this process creates the conditions for improving the effectiveness of public administration, strengthening democratic institutions and ensuring Ukraine's successful progress towards European integration.

To facilitate and continuously monitor institutional modernisation, it is advisable, it would be advisable to combine the Institutional Modernisation Framework with Gartner's governance maturity model. Gartner maturity models are structured methodologies for assessing the development of processes, technologies or data that help organisations move from reactive action to optimised management. However, the concept of the maturity model can also be applied to institutional transformations in public administration.

The main levels of maturity, according to Gartner, as applied to data and process management, are as follows:

1. Level 1: Awareness: Processes are chaotic and depend on individual parameters or factors. Problems are recognised, but there is no systematic approach.

2. Level 2: Reactive: Basic practices begin to be introduced, while actions are taken in response to crises or incidents.

3. Level 3: Proactive: Structured management emerges, procedures are documented, and risk prevention becomes established.

4. Level 4: Managed: Management is integrated into processes, and quality and effectiveness metrics are in place.

5. Level 5: Optimised: Data are used as a strategic asset, while processes are automated and continuously improved to ensure maximum value (Król & Zdonek, 2020).

Application of the Institutional Modernisation Framework and the Gartner maturity model allows consideration of the institutional modernisation of public administration not only as a conceptual model, but also as a staged process of institutional development. This is important for European integration research because this model identifies the stage of transformation of the public administration system and the steps to achieve European standards. Thus, the integrated model could be proposed, where the drivers of the reform and modernisation mechanisms, as well as institutional capacity, are considered in the light of institutional maturity. The maturity model makes it possible to assess the level of development of the public administration system and determine the logic of gradual institutional transformation. The adapted model includes five main levels of institutional maturity (Table 4).

Table 4. *Integrated model of institutional maturity in public administration*

Maturity level	Institutional characteristics	Main modernisation mechanisms	Role in European integration
1. Initial stage	Institutions function in a fragmented manner, administrative procedures are not standardised, and coordination between public authorities is weak	Initial administrative reforms, creation of a regulatory framework, and development of strategic documents	Formation of the basic prerequisites for adaptation to European standards
2. Developing stage	Standardised administrative procedures emerge, and institutional mechanisms of control and accountability are established	Civil service reform, development of anti-corruption infrastructure, and introduction of elements of e-government	Beginning of the harmonisation of national legislation with the *acquis communautaire*
3. Standardised stage	Stable governance structures are formed, and coordination between state institutions becomes more effective	Institutional strengthening, development of digital services, and strategic planning	Active implementation of European norms and governance standards
4. Managed stage	Institutions demonstrate a high level of managerial effectiveness, and digital governance tools are actively used	Full-scale digitalisation, integration of management processes, and development of network-based forms of governance	Deepening integration into the European administrative space
5. Optimised stage	Institutional structures are flexible, while public administration shows a high level of adaptability and innovation	Use of innovative management practices, data-driven governance, and strategic forecasting	Full integration into the European governance space

Source: *developed by the authors*

Combining the Institutional Modernisation Framework and the Gartner model to assess institutional maturity enabled the formation of an integrated analytical model that considers modernisation of public administration as a process of institutional development in stages. Within this logic, each stage of modernisation is associated with an increase in institutional quality and with the state's capacity to implement European governance standards. For Ukraine, the transition from the formalisation of institutional reforms to their stabilisation and systemic integration is particularly relevant. This requires not only the harmonisation of legislation, but also the formation of an effective administrative culture, the development of a professional civil service and the introduction of modern digital gov-

ernance tools. The integrated model makes it possible to view institutional modernisation as a multi-level process in which institutional change, administrative reforms and the development of managerial competences form the basis for Ukraine's successful European integration.

Conclusions

The article examined the process of institutional modernisation in Ukraine's public administration system in the context of European integration. The analysis showed that institutional quality plays a key role in ensuring the effectiveness of public administration and in implementing reforms aimed at bringing Ukraine closer to European Union standards. The use of grounded theory methodology made it possible to identify the main factors of institutional modernisation, among which particular importance is attached to the harmonisation of legislation with the *acquis communautaire*, the development of human capital in the civil service system, the introduction of digital governance technologies, the strengthening of anti-corruption mechanisms and the development of local selfgovernment.

The proposed conceptual model, the Institutional Modernisation Framework, demonstrates the relationship between reform drivers, modernisation mechanisms, the institutional capacity of public authorities and the outcomes of transformation in the public administration system. The model shows that effective modernisation of public administration is possible only through the systematic implementation of administrative reforms, the development of managerial competences and the strengthening of democratic institutions. The analysis of Croatia's experience of institutional reform shows that adaptation to European Union standards is a long and complex process; however, it contributes to improving the effectiveness of public administration, strengthening the rule of law and developing democratic institutions. For Ukraine, this experience is an important reference point in implementing the reforms required for further progress towards European integration. Thus, the institutional modernisation of public administration is a strategic prerequisite for Ukraine's successful integration into the European Union. The study proposes the Institutional Modernisation Framework as a conceptual model that reflects the relationship between reform drivers, mechanisms of institutional modernisation, institutional capacity and the outcomes of transformation in the public administration system. Combining this model with the approach to assessing institutional maturity developed by Gartner made it possible to construct an integrated analytical model that treats the modernisation of public administration as a staged process of institutional development. According to the integrated model, institutional modernisation of public administration passes through successive stages from the formalisation of institutional reforms of public administration to the creation of an innovative governance system able to respond adequately to socio-economic challenges. This approach makes it possible not only to conceptualise the process of public administration reform but also to assess the level of institutional maturity of public institutions.

The study also indicates that it is relevant for Ukraine to transition from institutional formalisation to institutional stabilisation and systemic integration of public administration processes. It includes enhancing strategic coordination of public authorities, raising the level of professional civil service, digital governance development, and mechanisms of interaction between the state, business and civil society. Hence, institutional modernisation of the public administration system should be considered as a complex long-term process, which involves legal, organisational and management changes. Implementing such a process will allow for achieving the goal of public administration modernisation to improve its effectiveness, strengthen democratic processes, consolidate Ukrainian society, and integrate Ukraine into the European administrative area. Further research should focus on the empirical measurement of the institutional maturity of Ukraine's public administration system, the analysis of the effectiveness of administrative reforms in the context of Europeanisation, and comparative studies of the experience of other candidate countries seeking accession to the European Union.

Acknowledgements

None.

Funding

None.

Conflict of Interest

None.

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СІнституційна модернізація публічного управління як передумова європейської інтеграції України

Віталій Баштанник
Доктор наук з публічного управління, професор
Дніпровський університет технологій
49005, просп. Дмитра Яворницького, 19, м. Дніпро, Україна
https://orcid.org/0000-0001-5969-3620

Адель Бикова
Кандидат економічних наук, доцент
Університет митної справи та фінансів
49000, вул. Володимира Вернадського, 2/4, м. Дніпро, Україна
https://orcid.org/0000-0001-7290-9094

Микола Попов
Доктор наук з публічного управління, професор
Одеський національний політехнічний університет
65044, просп. Т.Г. Шевченка, 1, м. Одеса, Україна
https://orcid.org/0000-0003-0204-1810

Оксана Баштанник
Доктор наук з публічного управління, професор
Дніпровський університет технологій
49005, просп. Дмитра Яворницького, 19, м. Дніпро, Україна
https://orcid.org/0000-0003-4067-3261

Петро Гарасим
Доктор економічних наук, професор
Національний лісотехнічний університет України
79057, вул. Генерала Чупринки, 103, м. Львів, Україна
https://orcid.org/0000-0001-5282-8799

Анотація. У дослідженні аналізується трансформація якості інституцій у контексті набуття Україною статусу кандидата на вступ до ЄС. Основна увага приділяється гармонізації національного права з європейськими стандартами (*acquis communautaire*), зокрема у сферах прозорості та підзвітності влади. Розглядаються механізми модернізації державного апарату, спрямовані на створення гнучких інституційних структур, здатних ефективно впроваджувати реформи. Автор обґрунтовує, що саме стабільність та ефективність інституцій є визначальним фактором для успішного переговорного процесу про членство в ЄС. Методологічною основою дослідження є якісний підхід із використанням інструментарію обґрунтованої теорії, що дозволив систематизувати ключові фактори інституційної модернізації та визначити їх взаємозв'язки. У статті запропоновано концептуальну модель Institutional Modernization Framework, яка відображає взаємодію драйверів реформ, механізмів модернізації, інституційної спроможності державних органів та результатів трансформації системи публічного управління. Окрему увагу приділено аналізу досвіду Хорватії щодо модернізації публічного управління у процесі вступу до Європейського Союзу, що дозволяє визначити потенційні виклики та можливості для України. Доведено, що ефективна інституційна модернізація потребує комплексного підходу, який включає правову адаптацію до стандартів ЄС, розвиток людського капіталу у сфері державної служби, цифровізацію управління та посилення ролі місцевого самоврядування. Зроблено висновок, що інституційна модернізація публічного управління на основі концепції Європеїзації є ключовою передумовою успішної інтеграції України до європейського управлінського простору та забезпечення сталого розвитку держави. На основі поєднання Institutional Modernization Framework із моделлю зрілості управління Gartner запропоновано інтегровану модель інституційної зрілості публічного управління

Ключові слова: людський капітал; якість інституцій; місцеве самоврядування; європеїзація; інституційна зрілість

DEMOCRATIC GOVERNANCE
Vol. 19, No. 1, 2026, 70-83
Journal homepage: https://d-governance.com.ua/
Received: 16.01.2026; Revised: 10.04.2026; Accepted: 28.05.2026; Published: 25.06.2026

UDC 327:351/354:342.5
DOI: 10.56318/dg/1.2026.70

E-ISSN 2070-4038

Methodology for assessing the impact of integration diplomacy on transparency, accountability and the effectiveness of public administration in small states

Nadira Dzhumadylova*
Master, Senior Lecturer
Bishkek State University named after Academician Kusein Karasaev
720044, 27 Ch. Aitmatov Ave., Bishkek, Kyrgyz Republic
https://orcid.org/0009-0007-5929-9245

Abstract. This study is relevant as integration associations are increasingly becoming a driving force of transformation in public administration systems of states that want to optimise administrative resources and improve the resilience of state institutions by collective mechanisms of cooperation. The study aimed to identify the mechanisms of transformation of the participation of the small state in multilateral integration formats into measurable changes in the quality of public administration and to develop a reproducible set of tools for their assessment, using the Kyrgyz Republic as a case study. The methodology included a conceptual method for operationalising governance categories, the author's framework of four channels of influence transmission, a case study of three empirical cases, and a matrix analysis of constraints. The findings revealed that the impact of integration diplomacy on the quality of public governance is differentiated and context-dependent. The channel of regulatory harmonisation primarily affects transparency and efficiency, whereas the channel of external monitoring primarily fosters intergovernmental rather than civic accountability. A case study of migration policy, the digital agenda and a foreign trade agreement showed that integration diplomacy creates necessary but not sufficient conditions for improving the quality of governance: the realisation of each channel's potential depends on the presence of complementary domestic reforms and sufficient administrative capacity on the part of the state. It was found that the systemic asymmetry in the coverage of governance categories, and the persistent gap between the high measurability of effects in the sphere of effectiveness and the low verifiability of effects in the sphere of accountability, is determined by the closed nature of security platforms. Particular attention is paid to how integration diplomacy indirectly strengthens the political security of a small state by enhancing the transparency, accountability and effectiveness of public administration. The practical significance of the study lies in the possibility of using the developed methodological framework to assess the governance effects of integration diplomacy in other small states with similar structural characteristics

Keywords: regulatory harmonisation; monitoring; asymmetry; institutional learning; indicator

Introduction

The transformation of international integration associations following the collapse of the bipolar system has made the question of how small states' membership of regional unions affects the quality of their domestic governance one of the most pressing issues in political science. The transition from a model of merely fulfilling international obligations to one of actively utilising integration mechanisms as a tool for institutional transformation was accompanied not only by growing economic interdependence among member states, but also by a fundamental shift in the role of supranational norms as regulators of domestic governance practices.

Studies of the economic effects of regional integration on small states have identified a consistent correlation between membership of such unions and the transformation of the governance environment. S. Bekbolotova *et al.* (2025) demonstrated that Kyrgyzstan's accession to the

Suggested Citation:
Dzhumadylova, N. (2026). Methodology for assessing the impact of integration diplomacy on transparency, accountability and the effectiveness of public administration in small states. *Democratic Governance*, 19(1), 70-83. doi: 10.56318/dg/1.2026.70.

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*Corresponding author (N.Dzhumadylova1@gmail.com)

Eurasian Economic Union (EAEU) increased the country's total exports, but did not reveal clear-cut effects on agri-food exports and total imports, indicating the differentiated and ambiguous nature of the trade effects of membership for small acceding states. A. Cerqua *et al.* (2024), in a broader analysis of the decade (1995-2015) of Eurasian integration, found that regulatory harmonisation within the EAEU creates asymmetric governance effects for different member states, pointing to the need for differentiated methodological approaches to their assessment.

Empirical data on specific aspects of governance in the Kyrgyz Republic allowed us to trace how integration processes transform specific governance practices. T.E. Furtana *et al.* (2025), based on survey data, found that public assessments of the socio-economic impact of the EAEU vary depending on the socio-demographic characteristics of respondents and their region of residence, which indicates an uneven distribution of the governance effects of integration. S.B. Kahyaoğlu *et al.* (2024) documented a persistent deficit of public trust in local government institutions in post-Soviet states, including Kyrgyzstan, attributing it to a lack of transparency in budgetary processes and weak participatory mechanisms. The authors found that this deficit is primarily determined by a lack of transparency in budgetary processes at the municipal level: citizens are systematically denied access to information on the allocation and expenditure of local budgets, which undermines the potential for civic oversight. An additional structural factor is the weakness of formalised participation mechanisms, which are either absent or merely declarative in nature, with no real influence on administrative decisions.

N. Komendantova *et al.* (2022) demonstrated that regional connectivity processes in Central Asia have multiple impacts on Kyrgyzstan's sustainable development, including an institutional dimension, whilst the authors noted the absence of a comprehensive methodology for assessing the governance implications of such processes. The authors noted that a country's participation in cross-border integration processes entails changes in the regulatory environment and administrative practices; however, they noted the absence of a comprehensive methodology allowing for a systematic assessment of the governance implications of such processes for small states. Y. Ji *et al.* (2026), drawing on the experience of tax, trade and financial reforms in the Kyrgyz Republic (KR), found that integration into the EAEU had stimulated the modernisation of fiscal administration and increased regulatory transparency; however, the effects of the reforms remained partial due to a lack of administrative capacity. At the same time, the authors noted that the effects achieved are partial and sectorally limited due to a persistent lack of administrative capacity among the state bodies responsible for implementing union regulations.

At the level of the regulatory and legal framework for accountability, N. Chynybaeva *et al.* (2024) analysed the mechanisms of constitutional and legal accountability of state bodies in the Kyrgyz Republic, identifying systemic contradictions in the legislation and weaknesses in accountability verification mechanisms as a structural constraint on the accountability of the executive branch. These trends were also reflected in the context of external regulatory influences. Z. Arynov (2022), drawing on data from Kazakhstan and Kyrgyzstan, found that the region's elites view the influence of the European Union (EU) with ambivalence: normative pressure is perceived both as a resource for institutional modernisation and as a threat to sovereignty in regulatory decision-making. A.-L. Hönig & S. Tumenbaeva (2022) demonstrated that the decline in democratic standards within the EU has weakened the persuasiveness of the European normative model for Central Asia, thereby limiting the potential of external normative channels to influence the quality of governance in the region.

Notwithstanding the wealth of empirical and theoretical research, the existing academic literature has typically analysed the governance effects of integration in isolation and either through the economic lens of trade and investment flows, or through the normative lens of legal harmonisation, or through the lens of public perception without reference to verified governance indicators. Works devoted to Central Asia have predominantly concentrated on individual aspects of governance without integrating the data into a single analytical framework. Studies focusing on the EAEU as an institutional format have emphasised economic outcomes, analysing governance transformations merely as a side effect. As a result, an operationalised methodology capable of simultaneously assessing the impact of integration diplomacy on transparency, accountability and the effectiveness of public administration through verifiable channels and indicators remained underdeveloped.

The aim of this study was to construct an operational framework linking specific integration decisions to measurable governance outcomes through a mechanism of influence transmission, and to test it using data from the Kyrgyz Republic. The following tasks were set within the framework of the study: to conceptualise three target categories of governance quality as applied to the conditions of a small state; to develop an original framework of channels for the transfer of influence; to identify systemic limitations of the methodology and determine the conditions for its applicability.

Materials and Methods

The study was conducted as a single-case study with elements of institutional analysis. The choice of a single case study is due to the priority given to methodological depth over comparative scope: the aim of the study is not cross-country comparison, but the development of a reproducible assessment framework applicable to other small states with similar structural characteristics. The choice of the Kyrgyz Republic as the sole subject of empirical testing is due to the fact that the country combines all the structural characteristics of a small state with resource asymmetry: limited diplomatic capacity, high dependence on external integration frameworks, and multi-vector

membership in both the EAEU and the Shanghai Cooperation Organisation (SCO), whilst possessing a sufficient documentary basis for verifying governance effects, which makes this case methodologically representative for testing the proposed analytical framework in its most illustrative form.

The study was conducted using four sequential methods. The conceptual method was applied to operationalise three target categories – transparency, accountability and the effectiveness of public administration – in the context of a small state participating in multilateral integration frameworks. The conceptualisation was based on methodological documents from international organisations: The Principles of Public Administration (Organisation for Economic Co-operation and Development, 2023), and the Worldwide Governance Indicators (WGI) methodology, specifically the sub-indices "Government Effectiveness", "Regulatory Quality" and "Voice and Accountability" (Kaufmann & Kraay, 2024; World Bank, 2025). The methodology of the Open Government Partnership's Independent Reporting Mechanism was also used as a normative benchmark for operationalising accountability (Open Government Partnership, n.d.), as well as the UN E-Government Development Index (EGDI) for assessing the operational capacity of government bodies in the digital environment (United Nations, 2024a; 2024b).

To operationalise the three target categories, a set of verifiable indicators was selected, each matched to a specific governance dimension, a data source, and a measurement unit. The indicator matrix is presented in Table 1.

Table 1. *Indicators for assessing transparency, accountability and effectiveness of public administration in the context of integration diplomacy*

Governance category	Indicator	Source	Measurement unit/ scale	Relevance to integration diplomacy
Transparency	1. EAEU regulatory acts published in national databases (number and timeliness)	Eurasian Economic Commission (EEC), Ministry of Justice KR	Count per year; average days from adoption to publication	Reflects harmonisation-driven disclosure
	2. Access to information rating (subindex of UN EGDI – Online Service Index)	UN DESA (EGovernment Survey)	0-1 score	Measures digital transparency in public services
Accountability	1. Parliamentary hearings on international agreements (number, public availability of minutes)	Jogorku Kenesh (parliament) website	Number per year; binary (minutes published / not)	Verifies legislative oversight of integration commitments
	2. WGI "Voice and Accountability" percentile rank	World Bank (WGI)	0-100 percentile	Crossnational benchmark for civic accountability
Effectiveness	1. WGI "Government Effectiveness" percentile rank	World Bank (WGI)	0-100 percentile	Overall administrative performance
	2. WGI "Regulatory Quality" percentile rank	World Bank (WGI)	0-100 percentile	Quality of integration-related regulatory frameworks
	3. Time required for customs clearance (average days)	EEC, National Statistical Committee KR	Days	Direct measure of administrative efficiency in EAEU trade

Source*: compiled by the author based on World Bank (2025), United Nations (2024a; 2024b), EEC annual reports; and parliamentary records of the Jogorku Kenesh*

Although the three target categories – transparency, accountability and effectiveness – form the core of the methodology, in the context of a small state their combined improvement creates the conditions for achieving a broader outcome, namely the strengthening of political security. In the context of integration diplomacy, the political security of the Kyrgyz Republic is understood as the state's ability to maintain sovereignty in political decision-making, minimise external destabilising influences and uphold the legitimacy of public institutions whilst participating in multilateral integration frameworks.

The author's method of constructing a diagram of channels of influence was used to develop a typology of four mechanisms through which integration diplomacy affects the quality of public governance: regulatory harmonisation, institutional learning, external monitoring and financial incentives. The diagram is based on institutional and legal sources defining the framework for the Kyrgyz Republic's participation in integration associations: the Treaty on the Eurasian Economic Union (2011), the Treaty on the Customs Code of the Eurasian Economic Union (2017) and the Constitution of the Kyrgyz Republic (2021).

The case study method was used to empirically test four channels of influence that could be verified using the available data sources. The case study on the EAEU's migration policy tested the regulatory harmonisation channel

in relation to the transparency category, based on data from the National Bank of the Kyrgyz Republic and the Eurasian Economic Commission. The SCO digital agenda case tested the external monitoring channel in relation to the accountability category, based on the Convention of the Shanghai Cooperation Organization on Countering Extremism (2021) and the Agreement on Cooperation in Ensuring International Information Security between the Member States of the SCO (2009). The case study on the agreement between the EAEU and Indonesia concerns the signing of a Free Trade Agreement (Eurasian Economic Union, 2025). The institutional learning channel did not receive a separate empirical case study due to the absence of verifiable quantitative indicators of its impact in open official sources; its conceptual rationale is presented in the theoretical section based on the principles of the OECD SIGMA. The matrix analysis method was applied to construct two analytical matrices: a matrix of realised potential, in which each channel of influence is matched with a dominant outcome and a verified gap between theoretical potential and the effect actually achieved; and a matrix of methodological constraints, in which each constraint is matched with a type of risk to the research outcome and a specific methodological correction tool. The matrices are constructed on the basis of the set of sources used in the case study, combined with data from the WGI and the UN EGDI sub-indices.

Results

Studying the impact of integration diplomacy on the quality of public governance requires, first and foremost, an operational definition of three key categories: transparency, accountability and effectiveness, as applied to the specific context of small states participating in multilateral integration frameworks. In this study, a small state is defined as a state with limited resources and structural vulnerability within the system of international relations, which compensates for its lack of influence through institutional participation in regional organisations. It is precisely this type of participation – instrumental rather than declarative – that creates specific channels of influence on internal governance processes.

In the context of integration diplomacy, transparency is defined as the degree to which information regarding a state's international obligations, the progress of negotiation processes, and the outcomes of the implementation of alliance norms is accessible to parliament, civil society and citizens. This interpretation is based on the concept of "disclosure of information as a mechanism of accountability", developed in the World Bank's (2025) methodology within the framework of the WGI, where transparency is operationalised through the "Voice and Accountability" sub-index and, to some extent, the "Rule of Law" sub-index. In the context of small states' integration diplomacy, transparency takes on a dual nature: on the one hand, participation in integration structures with uniform regulatory requirements compels the state to disclose data on the compliance of national legislation with union norms; on the other hand, the supranational nature of decision-making can create "grey areas" of accountability, reducing the availability of information to domestic oversight bodies.

Accountability is understood as the existence of institutional mechanisms through which executive bodies are accountable to the legislature and society for the international commitments they have undertaken and the results of their implementation. In the Open Government Partnership (OGP) methodology, accountability is defined through the state's commitments to independent monitoring of reform implementation, open budget data and mechanisms for feedback from citizens (Open Government Partnership, 2023). In the context of membership of integration associations, accountability takes on a multi-level structure: alongside internal accountability (parliamentary oversight, audit bodies), external accountability arises towards the supranational institutions of the unions, which set requirements for periodic reporting by member states.

The effectiveness of public administration is understood as the operational performance of government bodies in the implementation of accepted international obligations, including the quality of the regulatory environment, administrative capacity and the speed of adaptation of the regulatory framework. This category is measured by the "Government Effectiveness" sub-index in WGI system, which includes the quality of public services, the independence of the civil service from political pressure and the reliability of the fulfilment of government obligations (Kaufmann & Kraay, 2024). For small states participating in integration unions, the effectiveness indicator depends directly on the state apparatus's ability to transpose union norms into national legislation in a timely manner without accumulating legal conflicts.

A fundamental methodological argument in favour of this particular conceptualisation is that the three categories listed are not autonomous: transparency creates the informational basis for accountability, accountability generates institutional incentives to improve effectiveness, and effectiveness, in turn, reproduces the conditions for public trust and civic control. Integration diplomacy influences this triad not directly, but through specific channels of influence, the analysis of which forms the subject of the following subsection.

Participation in integration formats influences the quality of public governance not directly, but through specific institutional mechanisms. This study proposes an author-developed framework of four transmission channels through which a small state's membership in regional unions transforms transparency, accountability and the effectiveness of public governance. Each channel is characterised by its own mechanism of action, a target category of governance quality, a verifiable manifestation in the context of the Kyrgyz Republic, and a normative framework (Table 2).

Table 2. *Channels through which integration diplomacy influences the quality of public governance in small states*

Channel of influence	Mechanism of action	Target category of governance	Manifestation in the context of the Kyrgyz Republic
Regulatory harmonisation	The harmonisation of national legislation with federal standards increases the accessibility of regulatory information and resolves legal conflicts	Transparency; efficiency	Adaptation of customs, technical and sanitary regulations to the requirements of the EAEU; publication of draft regulatory acts as required by the Eurasian Economic Commission (EEC)
Institutional training	The participation of civil servants in supranational bodies and negotiating groups builds competencies that are not available within a purely national system	Effectiveness	Preparation of national positions for the Supreme Eurasian Council; participation in EEC technical committees and SCO working groups
External monitoring and conditionality	Systematic auditing of compliance with obligations by supranational institutions creates incentives to adhere to standards, including transparency standards	Accountability; transparency	EEC monitoring of member states' implementation of decisions; reporting to the SCO Regional Anti-Terrorism Structure (RATS) on cybersecurity incidents
Financial incentives	Access to joint programmes and preferential treatment is conditional upon compliance with management standards, which creates an economic incentive for administrative modernisation	Effectiveness	Certification of over 420 Kyrgyz companies to EAEU standards as a condition for access to the preferential terms of the agreement with Indonesia (2025)

Source*: compiled by the author based on the Treaty on the Eurasian Economic Union (2011), the Treaty on the Customs Code of the Eurasian Economic Union (2017), the Convention of the Shanghai Cooperation Organization on Countering Extremism (2021), Organisation for Economic Co-operation and Development (2023), Eurasian Economic Union (2025), E. Tsourdi & F. Zardo (2025), I. Jipa-Muşat & N.Piper (2026)*

The four-channel framework outlined above allows us to identify consistent patterns characterising the logic of how integration diplomacy influences the quality of public governance in small states. First, there is an asymmetry in the coverage of the governance categories. The effectiveness of public administration is mainly influenced by normative harmonisation and financial incentives, whereas the external monitoring channel has the greatest effect on accountability. Transparency is not just a function of one channel, however. It is a function of the intersection of normative harmonisation and external audit. This means that a state that participates in integration frameworks with developed mechanisms for harmonisation, but weak external control, achieves a governance effect mainly in terms of effectiveness, while transparency and accountability remain structurally inadequate. The pattern applied to the Kyrgyz Republic accounts for the fact that the WGI sub-indices "Government Effectiveness" and "Regulatory Quality" are characterised by more dynamic changes than "Voice and Accountability" despite the general activity of integration diplomacy.

Another important feature of the pattern identified, is the reduction of the verifiability when switching from economic to political channels. The financial incentives channel has the most measurable results. Company certification, customs statistics and export data can be quantitatively verified through official sources. The regulatory harmonisation channel is also verifiable but requires an analysis of legal acts. The institutional capacity-building channel can only be indirectly assessed through administrative reforms and the quality of negotiating positions as expressed in meeting minutes. The least verifiable channel remains external monitoring in closed security formats: results reported are not shared in public reports, creating a methodological gap where institutional changes are most relevant for accountability. There is a fundamental contradiction here, because the mechanisms that most powerfully affect external audit accountability are also the least open to independent verification.

Finally, all four channels are characterised by a structural time lag, though the magnitude of this lag varies significantly. Financial incentives yield the fastest results: changes in the behaviour of regulatory bodies can be observed within one to two years of an agreement coming into force. Regulatory harmonisation requires the transposition of norms into national legislation and the development of law enforcement practice; a typical lag is three to five years. Institutional learning and external monitoring yield a sustainable governance effect only with accumulated participation, measured by five to seven years of active membership.

Taken together, the identified patterns determine a key methodological requirement: the analysis of the impact of integration diplomacy on the quality of public governance must be based not on a single integrated indicator, but on a differentiated matrix of indicators that takes into account the specific nature of each channel, its time horizon and the degree to which results can be verified. The use of a single aggregated index, such as the composite WGI, inevitably masks the asymmetry between categories: an increase in the effectiveness of public governance may coexist with stagnation in accountability, whilst transparency emerges at the intersection of several channels, none of which is its sole determinant. This means that a correct assessment of the governance effects of integration diplomacy requires not only the selection of relevant indicators, but also a clear indication of the limitations of each in relation to a specific channel and time lag.

To provide empirical grounding for the proposed framework, the dynamics of key indicators over the period 2015-2025 were examined. The WGI "Government Effectiveness" percentile rank for the Kyrgyz Republic improved from 42.3 in 2015 to 51.7 in 2024 (World Bank, 2025), with the most noticeable increase occurring after 2018-2019, when the first major EAEU regulatory harmonisation packages were fully transposed. The "Regulatory Quality" sub-index followed a similar trajectory, rising from 44.1 to 53.2 over the same period. In contrast, the "Voice and Accountability" percentile rank remained almost stagnant (31.5 in 2015, 33.8 in 2024), confirming the pattern of asymmetric governance effects. The UN EGDI Online Service Index for Kyrgyzstan increased from 0.58 in 2018 to 0.72 in 2024 (United Nations, 2024b), reflecting progress in digital transparency, although the gain is partly attributable to domestic egovernment initiatives independent of integration diplomacy. These trends are consistent with the fourchannel logic: the most visible improvements are in efficiency-related indicators, while accountability shows only marginal change. To verify the theoretical propositions outlined, specific cases were analysed in which the identified channels of influence were implemented in the practice of the Kyrgyz Republic's integration diplomacy.

The legal context for a systematic change in the conditions of labour migration was created in 2015 by the entry of the Kyrgyz Republic into the EAEU. The main document is Article 97 of the Treaty on the Eurasian Economic Union (2011), which establishes the principle of equal treatment of workers from the member states of the Union in the labour markets of the Union: recognition of educational qualifications without additional nostrification procedures, equal access to social insurance, simplified procedure for the conclusion of employment contracts. This implementation of this provision has a measurable administrative effect in terms of transparency. Before the accession of the Kyrgyz Republic to the EAEU, the legal status of Kyrgyz labour migrants was primarily determined by bilateral agreements and national legislation of the host countries, which created structural opacity: a significant part of labour relations was formalised outside the legal framework or on the basis of documents that were not formally recognised. The institutional environment has been changed through harmonisation under Article 97 of the Treaty: Kyrgyz state bodies, primarily the Ministry of Labour and Social Development, have been given a formalised responsibility to maintain records of labour migrants, to inform them of their rights in EAEU countries and to give documentary support to their employment.

This change in practice has been shown by the events of 2024-2025. Against the background of the tightening of migration legislation in the EAEU countries, Kyrgyzstan launched a series of consultations within the framework of the Eurasian Economic Commission, which ended with the signing of additional protocols on the recognition of documents and the simplified renewal of employment contracts. This result is reflected not only in the economic metrics, but also in the administrative side: the expansion of the formal labour market increases the availability of employment statistics, improves the manageability of labour flows and reduces the share of informal practices, historically a source of opacity of information.

In terms of the WGI methodology, this case corresponds operationally to the sub-index "Regulatory Quality". The quality of the regulatory environment governing labour migration is improving as a result of the standardisation of requirements at the union level, which reduces regulatory uncertainty for both workers and employers. Additionally, the case touches upon the "Voice and Accountability" sub-index to the extent that parliamentary ratification of migration protocols through the Jogorku Kenesh ensures formal accountability of the executive branch when assuming relevant international obligations: in 2025, parliament ratified the updated migration protocols during public hearings involving expert organisations and MPs from the southern regions of the country (Constitution of the Kyrgyz Republic, 2021). At the same time, this channel of influence has a structural limitation: transparency in labour relations is increasing primarily in the formal sector, whilst the informal sector remains outside the scope of union regulations. This means that the measurable administrative effect is partial in nature and does not extend to the entire population of labour migrants.

The Kyrgyz Republic's chairmanship of the SCO in 2025-2026 has opened up an opportunity to institutionalise mechanisms for a collective response to cyber threats. The regulatory framework for this was provided by the Convention of the Shanghai Cooperation Organization on Countering Extremism (2021) and the decisions of the SCO Regional Anti-Terrorism Centre, which provide for the exchange of operational information between member states on cross-border threats. The significance of this case for the analysis of accountability lies in the following. Prior to the creation of the SCO Regional Digital Security Platform, the response of Kyrgyz state bodies to cyberattacks was conducted exclusively on a departmental, non-public basis: there were neither formalised criteria for recognising an incident as significant nor mechanisms for informing parliament or the public about the scale of the threats. The institutional structure established within the SCO has changed this situation in two ways. Participation in the joint platform entails standardised reporting of recorded incidents to a supranational coordinating body, which constitutes a form of external accountability. The recording and joint verification of such cases forms evidence base accessible not only to the security services but also to analytical bodies, which enhances the accountability of state bodies' actions in the information space.

The regulatory framework for joint monitoring of cyber threats within the SCO is the Agreement on Cooperation in Ensuring International Information Security between the Member States of the SCO (2009), which explicitly provides for the establishment of a system for monitoring and jointly responding to threats. The practical mechanism for the

implementation of this provision is the Joint Working Group of Experts of the SCO and RATS Member States, which has been operating since 2013 and promotes the operational exchange of data on harmful content in the information space. The fact of joint regulation means that the activities of Kyrgyz law enforcement agencies in cyberspace are under intergovernmental reporting requirements, which is an external constraint on the arbitrary use of technical means of surveillance or blocking, i.e., it is an institutional element of accountability, which was absent in a purely national regulation. From the standpoint of the UN EGDI, this case relates to the element of the "Online Services Index": the creation of digital monitoring mechanisms and inter-agency information sharing within the framework of union platforms have a direct impact on the operational capacity of government bodies in the digital environment (United Nations, 2024a). According to the data of the UN Department of Economic and Social Affairs (DESA), in 2024 the Kyrgyz Republic took the 78th place in the world ranking of EGDI with a score of 0.7316, being in the group of countries with a high level of e-government development (United Nations, 2024b). Participation in digital platforms of the SCO creates additional conditions for improvement of this indicator in the next evaluation cycles. It is necessary, however, to note a methodological limitation of this case study: SCO platforms in the field of cybersecurity operate predominantly in a closed mode, which limits the verification of reported results for external researchers. This means that accountability in this case is primarily intergovernmental rather than civil-society, which constitutes a structural flaw from the perspective of a comprehensive concept of accountability.

The signing of the free trade agreement between the Eurasian Economic Union (2025) and Indonesia on 22 December 2025 marked the first instance in which the Kyrgyz Republic acted as an active co-author of a major foreign trade agreement for the Union. From the perspective of this study, the significance of this case is determined not by the trade effect as such, but by the requirements for the regulatory environment that the agreement imposes on the state bodies of the Kyrgyz Republic. The Free Trade Agreement stipulates those goods claiming tariff preferences must comply with the EAEU's rules of origin, technical regulations and sanitary standards. For Kyrgyzstan, this means mandatory certification of export products in accordance with the Union's uniform technical regulations. This process has a direct administrative impact: government bodies responsible for technical regulation are obliged to ensure that their procedures comply with standards that are externally verifiable by the EEC.

In this case, the mechanism influencing the effectiveness of public administration is implemented through the fourth channel described above: financial incentives. Access to preferential treatment under the agreement with Indonesia is contingent not only on the possession of a certificate, but also on the administrative capacity of the Kyrgyz Republic's technical regulatory bodies: delays in issuing certificates or procedures that do not comply with the requirements of the Eurasian Economic Union (2025) directly reduce the export opportunities of domestic producers. This creates a measurable economic incentive for the administrative modernisation of regulatory bodies, without which reforming this segment of public administration would be a lower political priority.

Testing the methodology on three case studies revealed four systemic constraints, each of which is of a different nature – analytical, methodological, institutional and structural – and poses a specific risk to the reliability of the assessment results. To systematise these limitations and translate them into practical recommendations, a matrix was constructed, in which each limitation is matched with the type of risk to the research result and a specific methodological correction tool (Table 3).

Table 3. *Methodological limitations and tools for overcoming them*

Limitation	Type	Risk to the result	Recommended correction
Attribution problem	Analytical	Inability to isolate the contribution of integration diplomacy from other factors (domestic reforms, donor aid, change of government)	Difference-in-differences method; comparison with states not belonging to the relevant alliances
Time lag (2-7 years)	Methodological	False-negative conclusion regarding the absence of an effect in short-term analysis	Time series of indicators covering at least 5 years before and after the integration event under analysis
Incomplete coverage of instruments	Institutional	A gap in accountability measurement: the Kyrgyz Republic is not a member of the OGP; the IRM methodology is not applicable	Use of domestic accountability instruments: a) analysis of parliamentary hearing minutes on ratification of international agreements (2015-2025); b) audit reports of the Accounts Chamber on the implementation of unionrelated expenditures; c) monitoring of compliance with the Law of the Kyrgyz Republic "On Access to Information" regarding publication of draft EAEU regulations
Asymmetry of accountability across levels	Structural	Interstate accountability is not translated into civic oversight; closed SCO platforms may reduce public transparency	Distinction between external (supranational) and internal (civil) accountability as separate objects of measurement

Source: *compiled by the author based on Open Government Partnership (n.d.), Treaty on the Eurasian Economic Union (2011), Treaty on the Customs Code of the Eurasian Economic Union (2017), Convention of the Shanghai Cooperation Organization on Countering Extremism (2021), S. Hartmann et al. (2022), I. Pérez-Durán (2023), United Nations (2024a), A. Desai & A.P. Manoharan (2024)*

Although the Kyrgyz Republic is not an OGP member, the study partially compensates for this gap by systematically reviewing three domestic accountability channels: (i) the Jogorku Kenesh's official records of parliamentary hearings on EAEU and SCO agreements, which provide evidence of legislative oversight; (ii) the annual audit reports of the Accounts Chamber, which assess the efficiency of state spending related to integration commitments; and (iii) the implementation of the national Law "On Access to Information", which requires proactive publication of draft normative acts, including those adopted in fulfilment of union obligations. The analysis of these sources for the period 2015-2025 revealed that while formal parliamentary hearings were held for all major integration agreements, their minutes were published with significant delays (average 45 days), and public participation was limited to expert hearings without direct citizen input. This finding itself constitutes a measured indicator of accountability deficit, which would have remained invisible if only OGP methodology had been applied.

The testing carried out reveals a number of systemic limitations that must be taken into account when using the proposed methodology. The first limitation is the problem of attribution. None of the indicators used allows for the unambiguous isolation of the contribution of integration diplomacy from the effects of other factors influencing the quality of public administration, the political climate, donor aid, domestic reforms or changes of government. The value of the WGI's "Government Effectiveness" sub-index may improve as a result of administrative reform unrelated to EAEU membership, or deteriorate during periods of political instability, thereby offsetting the positive integration effect. To partially address this issue, future research is recommended to employ the difference-in-differences method, which compares the dynamics of Kyrgyzstan's indicators before and after key integration events with those of comparable states not belonging to the relevant unions.

The second limitation is the time lag. The impact of integration diplomacy on the quality of public administration is realised with a delay, which, depending on the channel, ranges from two to seven years. Regulatory harmonisation requires the transposition of union norms into national legislation, the adoption of subordinate legislation, and the development of law enforcement practice. This means that decisions taken in 2025-2026 within the framework of the EAEU and the SCO will not be fully reflected in the WGI and Consumer Price Index (CPI) indicators until 2028-2030 at the earliest. The use of aggregate indices in the short term creates a risk of a false-negative conclusion regarding the absence of an effect.

The third limitation is the incompleteness of the coverage of assessment tools. As established in the indicator matrix, the Kyrgyz Republic is not a member of the OGP, which makes it impossible to apply the OGP IRM methodology – the most detailed tool for assessing accountability at the level of specific government commitments. The absence of this tool creates a gap in the measurement of accountability that cannot be fully filled by other methodologies. The Kyrgyz Republic's accession to the OGP appears to be a necessary condition for the full application of the proposed methodological framework in the future.

The fourth limitation is the asymmetry of accountability across different levels. As the case of the SCO digital platform demonstrates, a significant proportion of the accountability mechanisms established through integration diplomacy are intergovernmental in nature and do not provide for direct public oversight. This means that integration structures strengthen the external accountability of state bodies to supranational institutions, without necessarily translating this effect into internal accountability to civil society. In some cases, membership of closed SCO platforms may provide institutional cover for reducing public transparency under the pretext of national security considerations.

The proposed analytical framework yields reliable results provided three conditions are met: the availability of verified primary data from state bodies and supranational structures broken down by specific integration decisions; the use of time series of indicators covering at least five years before and after the integration event under analysis; combining quantitative indicators with a qualitative analysis of legislative acts, ratification protocols and parliamentary hearings, enabling the verification of cause-and-effect relationships not captured by aggregate indices.

Taken together, the case studies and the matrix of indicators confirm that the impact of integration diplomacy on transparency, accountability and the effectiveness of public administration in the Kyrgyz Republic is real, yet differentiated and context-dependent. Governance effects are not an automatic consequence of formal membership in integration associations: they are realised through specific channels of influence transfer in the presence of complementary domestic conditions – administrative capacity, regulatory readiness and the political will to implement union obligations.

The most sustainable and verifiable effect is observed through the channel of regulatory harmonisation in areas where results are highly measurable: the legalisation of labour relations and the simplification of customs procedures have led to a measurable increase in transparency within the formalised segment of the economy, as confirmed by the dynamics of the WGI sub-indices. The financial incentives channel, tested using the free trade agreement with Indonesia as a case study, generates the most rapid and quantitatively verifiable effects in the efficiency category. The effect in the field of digital security remains the least verifiable due to the closed nature of the relevant SCO platforms, which gives rise to a fundamental contradiction: the mechanisms that have the most significant impact on accountability are simultaneously the least accessible for independent assessment.

This sets the priorities for both further research and public policy practice: increasing the transparency of digital cooperation mechanisms and the Kyrgyz Republic's accession to the OGP are institutional prerequisites without which a comprehensive assessment of the

governance impact of integration diplomacy remains methodologically incomplete.

Discussion

The research findings confirmed that the impact of integration diplomacy on transparency, accountability and the effectiveness of public administration in the Kyrgyz Republic took shape as a multi-level and context-dependent process, embedded within the broader dynamics of post-Soviet institutional transformation and regional integration. The analysis showed that governance effects were determined not so much by formal membership of integration unions as by the interaction between channels of influence and the state's internal administrative capacity: regulatory harmonisation, institutional learning, external monitoring and financial incentives generated qualitatively different outcomes depending on the sector, time horizon and degree of data verifiability. The significance of these findings lies in the fact that they have made it possible to identify a systemic asymmetry between the three target categories of governance quality: the effectiveness of public administration demonstrated the most consistent measurable effects, whereas accountability remained predominantly intergovernmental in nature, and transparency was established only within the formalised segment of regulated relations.

A significant conceptual contribution of the study is the development of the authors' framework of four channels of influence transmission (regulatory harmonisation, institutional learning, external monitoring and financial incentives), which enables a shift from a descriptive to a functional analysis of the governance effects of integration diplomacy. In this respect, the findings correspond with the conclusions of C. Barbera *et al.* (2025), who noted that the open challenges and complex problems of public governance in the 21st century require fundamentally new analytical frameworks that go beyond traditional approaches to accountability, which rely on linear models of causality. The results of this study have responded to this challenge in the specific context of a small post-Soviet state by developing a framework that accounts for non-linearity, asymmetry and the time lag of governance effects. At the same time, unlike interpretations focused on domestic mechanisms for public sector reform, the findings of this study showed that for small states with limited resources, the key source of institutional incentives for administrative modernisation is precisely supranational structures, rather than domestic reform coalitions, which fundamentally alters the logic of assessment.

The study's findings were compared with the conceptual conclusions of M. Lundgren *et al.* (2024), who proposed an approach to measuring the differentiated influence of supranational institutions on member states through an analysis of the parties' positions and negotiation outcomes. The data obtained testify to the applicability of this approach in the post-Soviet context and confirm the differentiated normative impact of the Eurasian Economic Commission on member states. In the Kyrgyz Republic, this impact is the most important in the sphere of customs regulation, technical control and labour migration, while in the areas of digital policy and financial regulation it is much weaker. Unlike the interpretations based on the European context, where supranational influence is implemented through political mechanisms and conditionality mechanisms with direct financial sanctions, the research findings showed that in the EAEU, this influence is mainly of a technical and regulatory nature. Changes in public administration in the Kyrgyz Republic are caused not by political pressure, but by requirements for product quality, certification standards and customs clearance procedures, which fundamentally changes the logic of measuring administrative effects.

An important contribution to the interpretation of the results was made by W. Sandholtz (2024), who argued that integration mechanisms can have sustainable effects on governance only if they are rooted in a larger system of rule of law and institutional norms based on the practice of public administration. The conclusion corresponds to the structural restriction set in the research. Regulatory harmonisation within the EAEU improves the efficiency of Kyrgyzstan's regulatory agencies only in those industries where the union regulations are backed by tangible economic benefits, while in the accountability and public transparency fields, the impact is considerably less given the absence of similar incentives for disclosure of information. There is a basic distinction between regulatory convergence as a formal process and institutional change as a substantive result. The former can be achieved by the technical requirements of EU standards, the latter requires political will, administrative capability and the cultural embedding of open governance norms which cannot be imposed from outside by integration mechanisms only.

Based on the case evidence and indicator dynamics, the four channels can be tentatively ranked by their observable governance impact in the Kyrgyz context. Regulatory harmonisation produces the broadest and most sustainable effects, particularly on transparency and efficiency, because it is backed by legally binding union norms and regular compliance monitoring by the EEC. Financial incentives generate the fastest, though more narrowly focused, effects – mainly on efficiency in the exportoriented sectors – as demonstrated by the Indonesia FTA case. Institutional learning shows modest and indirect effects, as competence building through participation in EAEU and SCO working groups does not automatically translate into domestic administrative reforms without complementary political will. External monitoring in closed security formats (SCO) yields the weakest verifiable impact on civic accountability, although it strengthens interstate reporting. This ranking is not static: it depends on sectorspecific factors, the degree of data openness, and the state's administrative capacity. However, it provides a heuristic for prioritising evaluation efforts: when resources are limited, assessment should focus first on regulatory harmonisation and financial incentives, where results are most measurable.

The identified asymmetry between supranational and civic accountability is consistent with the theoretical propositions of Y. Papadopoulos (2025) who established that in the system of transnational administration accountability is predominantly orientated horizontally – between organisations – rather than vertically – towards citizens – which generates a systemic deficit of democratic control even in the face of formally developed intergovernmental monitoring mechanisms. The results obtained confirmed this pattern in relation to the Kyrgyz Republic. SCO mechanisms in the field of cybersecurity establish inter-state accountability and standardisation of reporting to the supranational bodies, but do not generate either institutional incentives or technical conditions for civil control over the actions of state bodies in the information space. This is a structural, not a situational constraint. This conclusion is in substantive debate with the argument advanced by R. Lall (2025) who showed that multilateral accountability mechanisms in international institutions produce better governance outcomes if there is independent monitoring and civil participation. Concurrently, unlike the optimistic readings of R. Lall, findings of this research exposed a radically different picture: the closed nature of the security platforms of the SCO and the Collective Security Treaty Organisation (CSTO) might be not just a constraint on transparency, but an institutional cover for its active decline under the guise of national security considerations. This is a qualitatively different governance effect from that envisioned within the framework of the concept of multilateral monitoring.

The empirical findings of the study confirmed the conceptual argument put forward by D. Honig *et al.* (2023), according to which transparency does not automatically improve institutional performance, but only when there are specific incentives for stakeholders capable of translating the disclosed information into managerial changes to make use of it. In the context of Kyrgyzstan, this means that the expansion of the formal labour market through EAEU mechanisms has increased the availability of employment statistics and created a formal framework for monitoring migration flows; however, actual administrative improvements proved to be structurally constrained by the informal sector, to which union regulations do not apply, and incentives to use the disclosed information for reforming administrative practices remained insufficient. This conclusion is consistent with the arguments of P. Becker (2024), who systematised conditionality mechanisms as a tool of supranational governance and demonstrated that it is precisely financial conditionality that creates the most effective incentives for administrative modernisation. Although the EAEU mechanisms do not replicate the European conditionality system in its strict form with direct sanctions for non-compliance, the data obtained showed that the free trade agreement with Indonesia performed a functionally similar role: it created a measurable financial incentive for the administrative modernisation of Kyrgyzstan's regulatory bodies without formal political commitments, confirming the universality of the logic of conditionality as a mechanism for administrative change in various integration contexts.

The conclusion of J. Ege *et al.* (2021) that international bureaucracies influence the policy outcomes of member states through specific strategies of administrative influence that go beyond formally established powers and create informal channels of institutional influence, reveals the mechanism through which the Eurasian Economic Commission influences the administrative practices of the Kyrgyz Republic. The data obtained confirmed the applicability of this argument to the activities of the Eurasian Economic Commission: its technical influence on the national regulatory bodies of the Kyrgyz Republic proved to be a more significant factor in actual administrative changes than formal regulatory requirements, which indicates the need to take into account informal channels of bureaucratic influence when assessing integration effects.

The pattern revealed in the study – that the digital mechanisms of integration platforms increase the operational capacity of government bodies, but do not compensate for the institutional deficit in accountability – is consistent with the findings of N. Haug *et al.* (2024), who have demonstrated that digital transformation in the public sector leads to both incremental changes and cumulative transformational effects, the character and persistence of which are determined mainly by the institutional readiness of the organization, rather than the magnitude of the technological investment. The results of this study have shown that, contrary to optimistic interpretations of digitalisation as a universal means of improving governance efficiency, for the Kyrgyz Republic, participation in the digital platforms of the EAEU and the SCO improves aggregate indicators, recording progress in infrastructure and service dimensions, but does not bridge the substantive gap in the quality of regulatory procedures and mechanisms for civic participation. The study by E. Hedling (2025) who demonstrated that the digitalisation of diplomatic practices generates new forms of autonomy and discretion for diplomatic staff and qualitatively alters the nature of international interaction, without lifting the structural constraints determined by a state's position in the hierarchy of the international system. The findings of this study supported this argument in the case of a small state: digital diplomacy in the context of Kyrgyzstan's SCO presidency expanded the range of initiatives promoted; however, the transformational effect on public administration remained limited and did not translate into measurable improvements in accountability without the corresponding domestic institutional capacity.

A. Cieślik & O. Gurshev (2022) found that economic integration among post-Soviet economies does not lead to symmetrical governance outcomes, as the actual effects are determined by the quality of national institutions, the level of informal trade, and the extent to which corrupt practices are entrenched in administrative procedures. This corresponds to the structural constraint identified in the study: regulatory harmonisation within the EAEU is most

pronounced in the formal sector of the economy, where technical regulations and certification procedures are amenable to external verification, whereas in the informal sector, where corruption in customs administration is traditionally high, the governance effects proved to be insignificant and statistically difficult to verify. This conclusion is conceptually reinforced by the arguments of C. Knox & D. Sharipova (2023), who systematised public sector reforms in developing countries and demonstrated that the post-neo-managerial era is characterised by hybrid and layered reforms, in which new instruments are superimposed on existing institutional structures without substantively eliminating them. As applied to the Kyrgyz Republic, this means that the governance effects of integration diplomacy are realised against the backdrop of a Soviet administrative legacy that has not been eliminated, which imposes structural constraints even in the presence of strong external integration incentives and creates a fundamental limit to governance modernisation through external channels.

The research findings confirmed the conceptual argument put forward by T. Kolnberger & H. Koff (2021), who demonstrated that small states are forced to adopt seemingly paradoxical integration strategies, simultaneously reaping the benefits of membership in supranational structures whilst facing the inevitable constraints on regulatory sovereignty that these structures entail. The data revealed this paradox in the context of public administration: the Kyrgyz Republic derives measurable administrative benefits from its participation in the EAEU and the SCO, including expanded access to labour markets, technical certification standards, digital monitoring platforms, but at the same time adopts supranational norms that narrow the scope for national regulatory autonomy and limit the ability to adapt union requirements to the specifics of the domestic institutional context. This paradox takes on an additional dimension in light of the findings of D. Panke & S. Stapel (2022), who established that member states themselves create institutional overlap between international organisations for the purposes of strategic positioning and expanding negotiating leverage. The data obtained supplemented this argument with regard to the governance dimension: in the context of the Kyrgyz Republic, multiple membership of the EAEU, SCO and CSTO does indeed broaden the range of available tools for integration diplomacy, yet simultaneously generates transaction costs of inter-agency coordination, the risk of normative conflicts between the requirements of these unions, and a persistent deficit in administrative capacity for their simultaneous implementation.

The identified methodological problem of attribution was conceptualised through the lens of the arguments put forward by I. Mancheva *et al.* (2024), who demonstrated, through a comparative analysis of two states, that the distribution of powers between levels of government, the degree of autonomy of regulatory bodies, and the nature of political accountability play a significantly greater role than the substantive characteristics of the directives themselves. In the context of the Kyrgyz Republic, this implies that the identified differences in governance outcomes across sectors can be explained not only by the nature of union regulations, but also by the specific characteristics of the national administrative structure, the Soviet institutional legacy, and the degree of political commitment to implementing specific requirements. This points to the need to apply the differences-in-differences method, elaborated in detail by J. Roth *et al.* (2023) as a tool for causal inference in conditions of stagnant adoption, which allows the contribution of integration mechanisms to be isolated from other factors simultaneously influencing the quality of governance in the Kyrgyz Republic, thereby providing a methodologically sound basis for comparing the governance trajectories of states with similar structural characteristics.

Taken together, the discussion has shown that the findings of this study are generally consistent with the current academic literature on accountability, supranational governance and public sector reforms, whilst at the same time significantly refining it in relation to the specific context of a small post-Soviet state. The findings confirmed that the governance effects of integration diplomacy are determined not by the formal characteristics of union membership, but by the interaction between channels of influence, the state's internal capacity, and the degree to which outcomes can be verified within each specific governance category. This conclusion expands existing approaches by demonstrating that the proposed methodological framework of four channels provides an analytical toolkit for the systematic assessment of the governance effects of integration, which can be replicated in relation to other small states with similar structural characteristics. The particular significance of integration diplomacy mechanisms is evident in the context of neutralising unconstitutional threats. Increasing the transparency and efficiency of public administration through integration filters (digitalisation, supranational audit, harmonisation of regulations) helps to reduce corruption-prone areas within the state apparatus. Since systemic corruption and the inefficiency of public administration often act as triggers for socio-political destabilisation in small states, the tools of integration diplomacy de facto become a factor in ensuring domestic political stability and preserving the stability of the constitutional order of the Kyrgyz Republic.

Conclusions

The results of the analysis showed that this influence is differentiated and context-dependent in nature, being realised through four specific transmission channels with varying time horizons and degrees of verifiability.

It was found that the channel of regulatory harmonisation in the EAEU influences primarily and directly the transparency and effectiveness of public administration. The harmonisation of labour and customs legislation to Union standards has expanded the legal framework of labour relations and facilitated easier access to regulatory information for economic entities. This channel only deals with the formalised sector, and not informal practices, limiting the full extent of its governance impact. The external

monitoring channel, working through SCO mechanisms in the field of information security, primarily promotes inter-state accountability, not accountability of civil society. The regulatory framework ensures standardised reporting to supranational institutions. However, the closed nature of security platforms creates a methodological gap: the mechanisms with the greatest impact on accountability by external audit are at the same time the least accessible for independent verification.

A systemic asymmetry in the coverage of the three target categories of governance was identified. The effectiveness of public governance is ensured by the largest number of verifiable indicators. Accountability remains structurally insufficient in terms of civil control, as confirmed by the value of the "Voice and Accountability" sub-index. Transparency occupies an intermediate position, emerging at the intersection of regulatory harmonisation and external audit, but not being the exclusive result of either channel. A key institutional gap remains the absence of the Kyrgyz Republic's membership in the OGP, which deprives the study of the most detailed tool for verifying accountability at the level of specific government commitments.

At the same time, it was established that integration diplomacy creates necessary but not sufficient conditions for improving the quality of public administration. All four channels of influence open up institutional opportunities; however, their realisation depends on the presence of complementary domestic reforms in the regulatory framework, administrative capacity and inter-agency coordination. The gap between the theoretical potential of integration mechanisms and the results actually achieved in the Kyrgyz Republic is of a structural, institutional or capacity-related nature, depending on the specific category of governance. The cumulative improvement in transparency, accountability and efficiency creates an integrative effect of strengthening the political security of the Kyrgyz Republic, manifested in a reduction in external pressure, increased predictability of domestic political processes and the institutional legitimisation of the executive branch.

The proposed methodological framework can be adapted to other small states with similar structural characteristics (e.g., Armenia, Moldova, or Baltic states) by adjusting three parameters: (1) the set of relevant integration formats (EAEU, EU, SCO, etc.) and their specific regulatory instruments; (2) the availability of national accountability mechanisms (parliamentary oversight, audit institutions, access to information laws) to substitute for OGP membership if absent; and (3) the temporal horizon of analysis, which must be extended to at least five years before and after the key integration event to account for time lags. The indicator matrix can be replicated using each country's national statistical and institutional data, while the fourchannel framework remains invariant, as it describes generic transmission mechanisms of integration diplomacy.

A limitation of the study was its focus on official documents and aggregated international indices, which predominantly reflect a formalised institutional perspective and do not fully reveal informal governance practices. A promising avenue for further research is the application of the difference-in-differences method based on time series of sub-indices for periods before and after key integration events.

Acknowledgements

None.

Funding

The study was not funded.

Conflict of Interest

None.

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Методологія оцінки впливу інтеграційної дипломатії на прозорість, підзвітність та ефективність публічного управління в малих державах

Надіра Джумадилова
Магістр, старший викладач
Бішкекський державний університет імені академіка Кусеїна Карасаєва
720044, просп. Ч. Айтматова, 27, м. Бішкек, Киргизька Республіка
https://orcid.org/0009-0007-5929-9245

Анотація. Актуальність дослідження зумовлена зростаючою роллю інтеграційних об'єднань як факторів трансформації систем громадського управління в державах, які прагнуть оптимізації адміністративних ресурсів та підвищення стійкості державних інститутів через колективні механізми взаємодії. Мета дослідження полягала у виявленні механізмів, з яких участь малої держави у багатосторонніх інтеграційних форматах транслюється у вимірні зміни якості громадського управління, й у розробці відтворюваного інструментарію їхнього оцінки з прикладу Киргизької Республіки. Методологія включала концептуальний метод операціоналізації категорій управління, авторську схему чотирьох каналів передачі впливу, кейс-аналіз трьох емпіричних випадків та матричний аналіз обмежень. У результаті було встановлено, що вплив інтеграційної дипломатії на якість громадського управління має диференційований і контекстно-залежний характер. Канал нормативної гармонізації переважно впливає на прозорість та ефективність, тоді як канал зовнішнього моніторингу формує переважно міждержавну, а не громадянську підзвітність. Case-study міграційної політики, цифрової повістки та зовнішньоторговельного угоди показав, що інтеграційна дипломатія створює необхідні, але не достатні умови для підвищення управлінської якості: реалізація потенціалу кожного каналу обумовлена наявністю комплементарних внутрішніх реформ та достатньої адміністративної дієздатності держави. Було виявлено, що системна асиметрія охоплення управлінських категорій, стійкий розрив між високою вимірністю ефектів у сфері ефективності та слабкою верифікованістю ефектів у сфері підзвітності визначається закритим характером платформ безпеки. Особливу увагу приділено тому, як інтеграційна дипломатія опосередковано зміцнює політичну безпеку малої держави через підвищення прозорості, підзвітності та ефективності громадського управління. Практичне значення дослідження полягає у можливості використання розробленої методологічної схеми для оцінки управлінських ефектів інтеграційної дипломатії в інших малих державах з аналогічними структурними характеристиками

Ключові слова: нормативна гармонізація; моніторинг; асиметрія; інституційне навчання; індикатор

Journal
“DEMOCRATIC GOVERNANCE”

Volume 19, No. 1
2026

Managing editor:
Mykhailo Yanyshivskyi

Address for contacts:
Lviv Polytechnic National University
79013, 12 Stepan Bandera Str., Lviv, Ukraine
Tel.: +380322582282
E-mail: lpnu@d-governance.com.ua
https://d-governance.com.ua/