AI and Decision Support Systems in Public Administration: Interdisciplinary Insights from Romania

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Abstract

This article aims to explore the intersection of Artificial Intelligence (AI) and Decision Support Systems (DSS) in public administration, and initiate a new interdisciplinary framework for algorithm-driven governance. The integration of legal analysis, digital innovation theory, and empirical evidence in the research investigates how AI enhances decision-making quality, procedural transparency, and institutional responsiveness, especially in local contexts. It draws on the author's initial case study of Eprimăria as an experimental site for Romanian municipalities. The article presents a national-scale idea of AI for Public Administration (AI4PA). The proposed system imagines an interoperable, modular system in accordance with European regulatory frameworks (like the AI Act and GDPR) to facilitate explainable, traceable, and lawful digital decisions. The article presents both opportunities and obstacles, and explores algorithmic accountability, citizen-centric design, and cross-sector collaboration. Ultimately, it argues that responsible AI implementation can bridge administrative disparities, especially in under-resourced rural areas, and lay the foundation for a resilient and inclusive digital state.

Keywords: *artificial intelligence, public administration, e-government, assisted decision-making, interdisciplinarity.*

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1. Introduction

In the current landscape of rapid digital transformation, public administrations must simultaneously enhance institutional efficiency and respond to increasingly complex societal demands. This paper addresses a critical and timely question: how can AI-based decision support systems (DSS) contribute to a

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model of public governance that is not only efficient and data-driven, but also legally accountable and citizen-oriented?

The core innovation of this study lies in its proposal for a national platform — AI for Public Administration (AI4PA) — conceptually grounded in the author's own applied project, *Eprimăria*. More than a digital service tool, AI4PA redefines the administrative act through AI integration, enabling legal reasoning, algorithmic auditability, and participatory governance.

The paper adopts an interdisciplinary methodology combining administrative law, digital policy, and behavioral governance. It draws on doctrinal analysis, comparative case studies (e.g., Estonia, Portugal), and empirical results from the *Eprimăria* pilot to define the conditions for legally robust and socially equitable AI implementation in Romanian public administration.

Structured across key dimensions — conceptual framing, regulatory foundations (including the EU AI Act and GDPR), technical functionality of DSS, managerial transformation, and applied practice — the paper culminates in a proposal for a modular, interoperable AI4PA framework.

Designed for national scalability, the platform would strengthen transparency, standardization, and digital inclusion, especially in under-resourced local governments.

Responding to the conference's theme of interdisciplinary challenges in administrative sciences, this study bridges technological potential with legal and institutional reality. It positions AI4PA as a strategic solution for Romania's digital reform and a potential pilot for responsible AI governance in the broader European Administrative Space.

1.1. Theoretical Framework

Understanding the integration of artificial intelligence into public administration requires a complex and genuinely interdisciplinary framework. Such a framework would have to borrow from information technology, administrative sciences, public law, management, and social sciences in order to understand thoroughly the structural and cultural transformation resulting from digitalization in state–citizen relations.

From the point of view of administrative sciences, AI is conceptualized as a driver of institutional modernization, aligned with the values of digital governance. Decision support systems based on AI facilitate an enhanced proactive administrative style, an immediate and accurate response to the needs of citizens while optimizing internal efficiency.

Systems theory, based on cybernetic models of management, understands the state as an open system regulated by ongoing cycles of information, decision, and feedback. In this framework, artificial intelligence is an evolved decision

node that can create predictive knowledge and keep up the balance between legality and effectiveness.

The deployment of AI in public administration should align with core principles of administrative law. These core principles are legality, transparency, impartiality, and the right to due process. As highlighted in Romanian legal scholarship (e.g., Stănilă[2], Predescu[3]), algorithmic decision-making raises new questions regarding legal responsibility, the right to explanation, and data protection, particularly under GDPR and the EU AI Act.

From the perspective of an organization, the use of AI in the public sector entails significant shifts, such as the formation of new, blended professional positions like digital ethics officers and policy data analysts. These shifts necessitate an innovative and multifaceted leadership style that integrates institutional ideals with technology and social relationships.

In a sociological context, the use of AI technology within governance frameworks is legitimate only as long as the public acceptance of such decisions exists. The confidence of the public in the decisions made relies not only on the perceived effectiveness of the outcome, but on the outcome being fair, explainable, and participatory — all elements that influence the digital public administration's long-term viability.

2. Decision Support Systems in Public Administration – Role and Functionality

Due to relentless pressure from social intricacies, legal policies, and heightened requests for effectiveness, decision support systems (DSS) have become crucial to ensure contemporary and effective governance. They arose in response to corporate management needs, and now, in the context of public administration, they are being adapted to the need for faster computation of data, prompt rational processing of data, and higher transparency in administrative actions. A decision support system is a strategic information system that amalgamates data, sophisticated models, and computational tools. In the public sector, the systems have become part of the decision support infrastructure and operate within the integrated framework of various information streams. DSSs evolve from mere information support tools to collaborative agents where part of the decision is done, generated, or optimized through machine learning algorithms.

This new paradigm also presupposes a conceptual realignment of public administration, no longer as a mere bureaucratic machine but as an open cybernetic system, where flows of information and feedback loops become essential

[2] Laura Maria Stănilă (2020*), Inteligenta artificiala, dreptul penal si sistemul de justitie penala. Amintiri despre viitor,* Ed. Universul Juridic, Bucharest.

[3] Ovidiu Predescu, Ovidiu-Roland Predescu (2023), *Inteligența artificiala azi. O perspectiva a dreptului, a drepturilor omului, a eticii si nu numai,* Ed. Universul Juridic, Bucharest.

elements of organizational equilibrium. It is in this vision that administrative decisions are not the outcome of sporadic actions, but of ongoing processes of data gathering, analysis, simulation, and assessment — enabled through intelligent infrastructures that include machine learning and logical rule-based systems. It is this very interaction between algorithmic components and institutional frameworks that captures the nature of the interdisciplinary posture advocated through the conference. The use of DSS in public administration can already be observed in various institutional practices, such as risk management in criminal justice systems (e.g., COMPAS in the U.S.), performance monitoring of public employees, resource allocation in social services, or urban planning within smart cities. In these areas, algorithm-assisted decision systems enable administrations to adopt a proactive stance, based on anticipating behaviors and potential outcomes, thereby increasing operational efficiency and reducing delayed or inadequate responses[4].

Beyond the technological dimension, decision support systems also raise significant managerial and institutional challenges. Workflow reorganization, role redefinition, and recalibration of performance assessment processes become necessary. Implementing DSS entails the development of new professional competencies, not only in technical fields, but also in decision-making and ethics. Public managers are thus called to become not merely resource administrators, but orchestrators of human–algorithm interaction, capable of interpreting and validating AI-generated recommendations and intervening when contextual or moral judgment is required.

It should also be noted that the application of a DSS in an administrative environment goes beyond the optimization of internal processes[5]. It also has a very robust democratic function, particularly when coupled with public participation and transparency procedures. If decisions are based on open and transparent data, and citizens are able to participate in the decision-making process via electronic feedback, consultative voting, or civic actions within electronic platforms, public administration confidence is greatly increased. The DSS is thus not just a technical tool, but also one of institutional legitimacy, particularly in the context of rapid, customized, and well-supported responses.

3. Public Administration and Artificial Intelligence: Opportunities

Over the past two decades, the practice of public administration has been actively engaged in a process of digital transformation, as much driven by the pressure of technological change as by the increasing expectations of citizens for

[4] Laura Maria Stănilă, *op. cit,* p. 35 et seq.

[5] B.S. McIntosh et al. (2011), "Environmental Decision Support Systems (EDSS) Development – Challenges and Best Practices," *Environmental Modelling & Software* vol. 26, no. 12: 1389–1402, https://doi.org/10.1016/j.envsoft.2011.09.009.

increased accessibility, speed, and transparency in public services. Artificial intelligence (AI) is an institutional transformation driver and an essential component to reengineer the state-citizen relationship[6]. AI reengineer public administration paradigm, management of resources, optimization of decision-making, and administrative efficiency. Artificial intelligence facilitates the automation of routine processes and alleviates bureaucratic tensions.

Public sector personnel are liberated from routine tasks and redirected to tasks that demand greater complexity and decision-making capabilities. Second, public decisions can be improved through predictive analyses and risk assessments based on historical and behavioral data models, that allows for better anticipation of social phenomena and more efficient resource allocation. AI facilitates citizen participation in the decision-making process through digital platforms that enable public consultation, electronic voting, and real-time feedback[7].

The visualization and correlation of public data are also enhanced through the use of AI tools, which can transform fragmented datasets into intelligible and accessible analytical dashboards, thus supporting more informed decision-making. Lastly, AI allows for constant monitoring of public services and institutional performance, helping to build a more responsive and adaptable administrative mechanism.

As noted in the academic literature, "the digitalization of local administration and AI-assisted decision-making provide unprecedented opportunities,"[8] particularly due to AI's ability to automatically extract relevant information, identify institutional bottlenecks, and optimize resource distribution. These benefits are already being leveraged in various national and European contexts.

AI's potential is especially visible in the fields of urban planning and territorial development. Smart city shows the potential of AI-assisted administration for mobility, energy, public health, and safety[9]. The aggregation of real-time data

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[6] João Reis, Paula Espírito Santo, and Nuno Melão (2019), "Impacts of Artificial Intelligence on Public Administration: A Systematic Literature Review," *2019 14th Iberian Conference on Information Systems and Technologies (CISTI)*, IEEE Xplore, Coimbra, Portugal, pp. 1-7, https://doi.org/10.23919/CISTI.2019.8760893.

[7] Shivani Nautiyal, Manu Sharma, Pradeep Joshi (2025), „AI and ML Enabled Smart Cities Information Management System for Disseminating CSR Initiatives", in S. Kannadhasan, P. Sivakumar, T. Saravanan & S. Senthil Kumar (eds.), *Proceedings of the International Conference on Sustainability Innovation in Computing and Engineering (ICSICE 2024)*, p. 65-72, Doi: 10.2991/978-94-6463-718-2_7, Springer Nature.

[8] Dazhao Ni (2022), "Public Administration in the Age of Digital Intelligence: Challenges and Responses," in Augustin Holl, Jun Chen, Guiyun Guan (eds.) *Proceedings of the 2022 5th International Conference on Humanities Education and Social Sciences*, p. 1313–20, https://doi.org/10.2991/978-2-494069-89-3_150, Springer Nature.

[9] Md Eshrat E. Alahi, Arsanchai Sukkuea, Fahmida Wazed Tina, Anindya Nag, Wattanapong Kurdthongmee, Korakot Suwannarat, and Subhas Chandra Mukhopadhyay. 2023. "Integration of IoT-Enabled Technologies and Artificial Intelligence (AI) for Smart City Scenario: Recent Advancements and Future Trends" *Sensors* 23, no. 11: 5206. https://doi.org/10.3390/s23115206.

and correlation seemingly unrelated phenomena makes AI a strategic tool for urban governance. In cities such as Barcelona and Copenhagen, AI platforms are used to manage traffic flow, monitor energy consumption, and plan emergency interventions, and thus fosters an adaptive form of governance grounded in intelligent response[10].

Another notable aspect is the use of conversational agents to mediate direct interaction with citizens. Chatbots answer questions, assist with form completion, and manage appointments in an automated manner. AI redefines the dynamics of the citizen–administration relationship and reduces the gap between institution and individual[11].

Through decision traceability, algorithmic audits, and impact scoring, public institutions can offer clear justifications for their decisions, thereby it increases trust in administrative authority. AI acts as a catalyst to advance the concept of e-government, in which the citizen becomes an active partner to shape public services, rather than a passive recipient[12].

The grasp of such a novel administrative paradigm calls for a deeply interdisciplinary approach, integrating technology, administrative sciences, social psychology, and public law. Artificial intelligence transcends the level of a simple technological solution, and presents itself as a cognitive challenge that impacts the entire modern governance systems. It provides a firm foundation for the realization of a data-driven, participatory, and flexible model of administration, which is perfectly in line with the conference theme of interdisciplinary challenges of administrative sciences.

4. Legal Challenges of AI-Assisted Decision-Making

As artificial intelligence continues to take on an increasingly dominant role in the making of administrative decisions, the legal community is confronted with a host of fundamental challenges to legality, legitimacy, and institutional responsibility. Here, one of the underlying principles of public administration is transparency in decision-making, but that is undermined when decisions are motivated by or generated through black-box algorithmic systems, which often defy being deciphered by the decision-makers and interested citizens. A central issue

[10] Benedicto Alwar, Hector Edgardo, and Edwardo Faustino (2024), "Integrating IoT and Artificial Intelligence for Sustainable Smart City Development: A Case Study Approach," *ITEJ (Information Technology Engineering Journals)* vol. 9, no. 2: 80–90, https://doi.org/10.24235/itej.v9i2.137.

[11] Kritika Bajracharya (2024), "Big Data and Artificial Intelligence Integration in Modernizing Governance and Public Administration Practices," *Global Research Perspectives on Cybersecurity Governance, Policy, and Management,* vol. 8, no. 12: 34–47, https://hammingate.com/index.php/GRPCGPM/article/view/7.

[12] Abdullah M. Al-Ansi, Askar Garadb, Mohammed Jaboobc, Ahmed Al-Ansid (2024), "Elevating E-Government: Unleashing the Power of AI and IoT for Enhanced Public Services," *Heliyon* vol. 10, no. 23: e40591, https://doi.org/10.1016/j.heliyon.2024.e40591.

of law is who is to be held responsible in decision-making. If a wrong or immoral decision is caused by a recommendation generated by a computer program, it has to be determined who is responsible: the institution, the public servant who made the decision based on the recommendation, the algorithm creator, or the AI system as a technological artifact? This ambiguity is exacerbated by the absence of a specific legal framework tailored to the realities of automated decision-making and the distribution of responsibility within digital ecosystems.

Equally significant is the citizen's right to understand the rationale behind administrative decisions that affect them. Many of the AI systems currently in use are based on complex neural networks, which are difficult to interpret even for experts. As a result, the "right to explanation" — enshrined in European regulations — is undermined by the opaque nature of these technologies. In the absence of explainable and verifiable mechanisms, AI-assisted decision-making risks deviating from the rule of law and the minimum guarantees of fair administrative procedures[13].

Another critical dimension concerns the respect for the principles of legality, proportionality, and non-discrimination. Algorithms inherently learn from existing data, which may reflect systemic biases or contain structural errors. Therefore, there is a real risk that AI will reproduce — or even amplify — existing social inequalities, leading to discriminatory or arbitrary decisions that may go undetected. Continuous oversight and the development of algorithmic audit methodologies are essential to ensure the ethical and legal compliance of automated decision systems. Furthermore, the protection of personal data becomes a foundational pillar in the context of digital administration. According to the General Data Protection Regulation (GDPR), any automated processing of data with legal implications for an individual must adhere to strict criteria of lawfulness, proportionality, and transparency[14]. Within the field of artificial intelligence, where decision-making in most instances is based on the processing of large quantities of personal data, said provisions set explicit technical and organizational boundaries. Fields of consent management, data anonymization, and the rights of erasure or rectification are just some of the aspects that need to align with the functional designs of algorithmic systems. The scholarly literature perpetually emphasizes the complexity of legal issues associated with artificial intelligence. Both Predescu and Stănilă argue that the full potential of these technologies has yet to be appreciated, which requires going beyond the paradigms of administrative law to a synthesis model that includes legal theory, technology ethics, and fundamental

[13] Steven M. Appel and Cary Coglianese (2021), "Algorithmic Administrative Justice," in Marc Hertogh, and others (eds), *The Oxford Handbook of Administrative Justice*, Oxford Academic, 481–502, https://doi.org/10.1093/oxfordhb/9780190903084.013.24.

[14] Gianclaudio Malgieri (2021), "'Just' Algorithms: Justification (beyond Explanation) of Automated Decisions under the General Data Protection Regulation," *Law and Business* vol. 1, no. 1: 16–28, https://doi.org/10.2478/law-2021-0003.

rights in a digital environment. The 2021 European Conference on Artificial Intelligence pointed out that re-legislating in the context of algorithmic governance requires rigidly defined laws for public administration that are agile[15], self-governing, open, and dependable. With such a premise, the difficulty shifts from normative to more conceptual challenges: it requires the reconstruction of administrative normative and legitimacy in a framework upheld by the relationships among people, institutions, and algorithms. There must be an equilibrium to incorporate all aspects where legal theory, computer science, public administration, and ethics converge to answer the needs of public administration and artificial intelligence regulation. It is only through this interdisciplinary collaboration that a legal framework makes it possible to build a modern, efficient, and ultimately responsible administration.

5. Managerial and Institutional Implications

The integration of artificial intelligence into public administration represents not merely a technological challenge, but above all an organizational and managerial one. Decision support systems based on artificial intelligence require institutional structural realignment, a change in the attitude of staff members, and a reorganization of the relationship between human beings, technology, and decision-making.

Most public institutions run on classical, inflexible organizational schemes with well-defined hierarchies and vertical decision paths. Accelerated models of digitalization need to be reconsidered and reorganized to adopt more adaptable systems based on collaboration, information sharing, and rapid decision-making. The integration of artificial intelligence offers a new operating model in administration based on constant feedback, self-adjustment, and timely responding. This transformation is a radical deviation from the classical bureaucratic culture.

Administrative officers not only need to be proficient in the use of technology, but also need to comprehend how algorithmic decisions are generated, what the limitations of these systems are, and how to interpret results.

New competence is not merely technical knowledge but rather ethical and legal factors, particularly in light of the fact that automated decision-making can have legal implications directly affecting individuals. The Romanian National Agency of Civil Servants stated that over 1.2 million people were working in public administration in 2019, and created a large workforce that, in theory,

[15] Thomas Dratsch, Liliana Caldeira, David Maintz & Daniel Pinto dos Santos (2020), "Artificial Intelligence Abstracts from the European Congress of Radiology: Analysis of Topics and Compliance with the STARD for Abstracts Checklist," *Insights into Imaging* vol. 11, article no. 59, https://doi.org/10.1186/s13244-020-00866-7.

could be aided by these technologies[16]. The clerical or support staff-level resistance or indifference to change, at least in terms of adopted digital technologies, is one of the most difficult challenges to this strategy. Intelligent decision support systems, for instance, have the potential to be seen as encroachments on autonomy that could undermine professional post the organizational stagnation. Such measures of artificial intelligence integration would require an open internal communications policy, teamwork, and system-wide organizational structure to be more welcoming toward change, especially culture shifts. The public manager's role becomes vital at this stage. The public manager, once a mere policy implementer, is now a digital transformation driver and as such must deftly navigate the convoluted overlap of technology, legal framework, and socio-administrative dynamics. A public manager in the 21st century is expected to have transversal competencies and would need to comprehend the information ecosystem, algorithmically assess risks, be law savvy, and possess leadership that encourages participation[17]. Essentially, a new profile emerges — that of a public innovation leader, formed in the spirit of adaptive governance, agile management, and outcome-oriented organizational design[18].

This new managerial reality also raises important discussions about the status, career path, and responsibility of the public manager in a hybrid administrative environment. In an administration where human–algorithm interaction becomes the operational norm, managerial roles must be redefined to reflect both emerging risks and new opportunities. The public manager becomes the guarantor of balance between efficiency and accountability, between innovation and institutional protection[19].

In essence, the managerial and institutional challenges generated by the introduction of AI in public administration are inherently interdisciplinary[20]. They require the alignment of strategic vision with organizational realities, legal norms with technological dynamics, and citizen needs with decision-making

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[16] Adriana Circiumaru (2024), "Transparency and Competence in the Public Sector – a New Recruitment System and a Unified Database for the Public Administration in Romania," EIPA, https://www.eipa.eu/epsa/transparency-and-competence-in-the-public-sector-a-new-recruitment-system-and-a-unified-database-for-the-public-administration-in-romania/.

[17] P. K. Agarwal (2018), "Public Administration Challenges in the World of AI and Bots," *Public Administration Review* 78, no. 6: 917–21, https://doi.org/10.1111/puar.12979.

[18] Jenny M. Lewis, Lykke Margot Ricard, and Erik Hans Klijn, "How Innovation Drivers, Networking and Leadership Shape Public Sector Innovation Capacity," *International Review of Administrative Sciences* 84, no. 2 (2018): 288–347, https://doi.org/10.1177/0020852317694085.

[19] Rhys Andrews, George Boyne, Richard Walker (2011). „The impact of management on administrative and survey measures of organizational performance", *Public Management Review*, vol. 13, no. 2: 227-255.

[20] Anca Florentina Vatamanu and Mihaela Tofan (2025), "Integrating Artificial Intelligence into Public Administration: Challenges and Vulnerabilities," *Administrative Sciences* vol. 15, no. 4: 149, https://doi.org/10.3390/admsci15040149.

structures. Without this alignment, technology risks remaining an isolated innovation with no lasting systemic impact.

6. Case Studies

The experiences of various European states in the digitalization of public administration demonstrate the diversity and dynamism of the strategies adopted, shaped by institutional culture, available technical resources, and citizen pressure for modern services. In the context of digital transformation and AI integration in the public sector, these examples offer valuable benchmarks for reflecting on the challenges and opportunities faced by Romanian public administration.

Estonia is widely recognized as a benchmark in the field of e-government. Through the "X-Road" platform, Estonian public institutions are interconnected in a unified digital ecosystem that enables secure data exchange and the automated provision of public services.

The Estonian system is based on the "once only" principle, under which citizens are not required to give the same information to different institutions. Administrative decisions are often supported by artificial intelligence technologies in risk evaluation and to handle bureaucratic processes. Italy serves as a case in point where digital evolution goes alongside a robust legal framework. The process of digitization in the judicial sphere commenced with Legislative Decree No. 82/2005, which instituted the Digital Administrative Code, and was later supplemented by laws that required documents to be transmitted and stored electronically. The "PCT" and "Giustizia Digitale" projects developed an integrated platform for e-signatures and the management of judicial documents[21]. Because of professional class trainings and procedural standardization, the professional frameworks alongside widespread homogeneous adoption became feasible. Spain developed and implemented significant systems for the digitalization of justice with the LexNet platform which is used by over 600 courts and enabled automatic notification of judgments as well as the exchange of documents electronically between legal practitioners. Spain has been focused and concerned with confidential and professionalized gateways to e-case files, and emphasized the safeguard of personal information in electronic systems. Slovenia sought to enhance interoperability and streamline processes within the system through the implementation of the COVL system. It serves as a technological framework for communication between different institutions. Slovenia encouraged the use of technology in integrated enforcement procedure automation to minimize expen-

[21] Giancarlo Buccarella, Francesco Fimmanò, Ines Simona Immacolata Pisano, *Giustizia Digitale. Processi telematici e udienza da remoto*, accessed August 14, 2025, https://shopdata.giuffre.it/media/estratti/ESTRATTO_024210838.pdf.

sive and time-consuming legal processes. Through defined procedures and application of standardised norms, Slovenia has ensured digital transformation with certainty and avoidance of fragmentation in the use of new technologies in the public sector.

Germany has aimed its digitalization policy at streamlining the enforcement system as well as institutionalizing the electronic process of debt recovery. Electronic notice systems and automated procedures have helped reduce delays, especially in debt enforcement cases, thus reducing administrative costs and accelerating the decision-making process.

In Romania, while it has developed more gradually and sometimes piecemeal, the judiciary has started implementing digital solutions, especially since the post-pandemic era.

Law No. 214/2024 on the use of electronic signatures, time stamps and the provision of trust services based on them, as well as the extended use of certified email and video conferencing, have created the conditions for a minimally functional digital infrastructure.[22] However, challenges persist in terms of interoperability, staff training, and the systematic integration of AI into decision-making processes. Despite these obstacles, there are visible signs of alignment with European trends, especially through pilot projects and the growing interest among scholars in consolidating a digital justice system tailored to citizens' needs.

These European experiences reflect a progressive convergence toward a shared digital administrative space, where AI, interoperability, transparency, and data protection become essential criteria for good governance. Within this landscape, Romania has the opportunity not only to adopt established models, but also to develop its own solutions through an interdisciplinary approach in which legislation, technology, institutional management, and organizational culture act in concert.

7. Applied Case Study: "Eprimăria" – Digitalizing the Administration–Citizen Interaction

A relevant example that supports the arguments presented in this paper is the "Eprimăria" project. The project involves the development and testing of a web-based application dedicated to local public administration, particularly in rural areas, and proposes a concrete alternative for the digitalization of public services, with a focus on efficiency, communication, and accessibility.

The application is based on a modular three-tier architecture and aims to reduce bureaucratic barriers between institutions and citizens. Through this platform, users can access public information, interact with civil servants via a chat

[22] Published in the Official Gazette, Part I no. 647 of July 8, 2024.

system, submit administrative requests online, schedule appointments, and participate in public consultations through electronic voting mechanisms. The functionalities are differentiated based on user type: citizens, municipal employees (by department), and platform administrators.

On the legislative side, the project considered the applicable regulations on electronic signatures, personal data protection (GDPR), and the need for institutional interoperability, inspired by Nordic models of digital governance. The platform complies with security requirements (two-factor authentication), role-based access permissions, and data backup mechanisms, all of which contribute to a robust and scalable digital ecosystem[23].

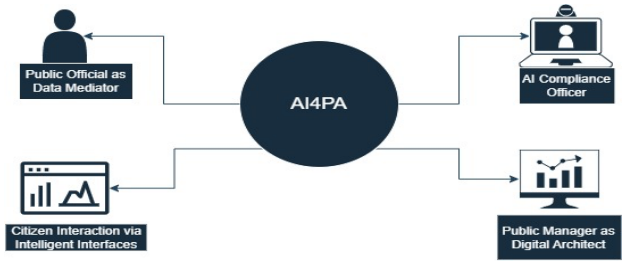

Figure 1 Institutional Impact: Transforming Roles in Local Administration through AI4PA

"Eprimăria" is therefore more than a technological proposal, it is a practical demonstration of the convergence between technology, legislation, public management, and citizen needs. Through its functionalities and architecture, the platform effectively reflects both the challenges and interdisciplinary potential of public administration digitalization, a core theme of this paper and of the conference.

Beyond its immediate technological component, the "Eprimăria" project may also serve as an exploratory foundation for developing decision support systems in local public administration. Structured data collection, user behavior analysis, request prioritization, and administrative workflow mapping create the conditions for a system that not only facilitates communication but also offers a solid basis for informed institutional decision-making[24]. The platform could be ex-

[23] Cristian Dumitrescu (2024), "Digitalization of Public Administration in Romania: The Way towards Efficiency and Accessibility," *Perspectives of Law and Public Administration* vol. 13, no. 1: 167–73, https://doi.org/10.62768/plpa/2024/13/1/18.

[24] Tara Qian Sun, Rony Medaglia (2019), "Mapping the Challenges of Artificial Intelligence in the Public Sector: Evidence from Public Healthcare," *Government Information Quarterly* vol. 36, no. 2: 368–83, https://doi.org/10.1016/j.giq.2018.09.008.

panded with modules for predictive analysis, impact scoring, or citizen satisfaction evaluation, transforming it into an active decision-making tool for local governance.

From this perspective, "Eprimăria" stands as a Government-to-Citizen (G2C) application that concretely illustrates the directions promoted by European e-government strategies. It demonstrates evolution of technical project into a digital governance mechanism. The direct impact on institutional efficiency, transparency, and public participation is evident. Moreover, the project identifies challenges of implementation of such solutions in the Romanian public sector such as limited digital infrastructure, staff training gaps, cultural barriers, and lack of systemic interoperability.

Integration of such initiatives at a national level contributes to align Romanian public administration with the norms and values of the European Administrative Space. Romania holds transparency, efficiency, and democratic participation as fundamental principles for AI. Thus, "Eprimăria" is not merely a practical digitalization exercise, but a functional demonstration of interdisciplinary potential to reconstruct the administrative system.

7.1. Legal Framework: The Administrative Act in the Age of AI

The integration of artificial intelligence (AI) and decision support systems (DSS) into public administration is reshaping the nature of the administrative act. Traditionally, administrative decisions are grounded in law, issued by a human authority, and justified through explicit reasoning. AI introduces new decision dynamics — algorithm-generated outputs, statistical modeling, and machine learning recommendations — raising challenges for legal accountability and procedural fairness.

In response to these developments, the EU Artificial Intelligence Act classifies most administrative AI tools (e.g., automated eligibility checks, digital permitting, citizen scoring) as high-risk systems, subject to legal obligations including human oversight, transparency, documentation, and algorithmic audit. This new category of administrative activity — algorithm-assisted decision-making — requires not only compliance with formal legality, but also structural safeguards embedded in code, ensuring that discretion remains legitimate, traceable, and contestable.

In this context, this paper proposes the development of a national platform: AI for Public Administration (AI4PA), built on AI and DSS, to support Romanian institutions — especially at local level — in delivering faster, more coherent, and citizen-oriented public services. AI4PA would serve not merely as a technological upgrade, but as a legal and institutional redesign of how administrative acts are produced, reviewed, and audited in a digital ecosystem.

Relevant international models support this vision. For instance, Portugal's AI4PA project, developed under the guidance of UNU-EGOV, aims to integrate data science and AI into public institutions, focusing on legal compliance, ethical standards, and institutional performance.

Similarly, Estonia's X-Road and Finland's AuroraAI illustrate how national platforms can integrate public services across domains through automated reasoning and citizen-focused design.

To be effective in Romania, however, such a system would have to be complemented by a responsive legal system to facilitate digital discretion without jeopardizing fundamental legal safeguards. This would need cross-professional collaboration between lawyers, engineers, institutional designers, and data ethics specialists[25]. AI should not substitute for administrative law, but as a tool to assist it in the age of the algorithm — when law, data, and regulation intersect.

Deploying a national AI-driven decision support system like AI for Public Administration (AI4PA) would not just automate procedures [26] — it would radically transform work and roles in local public institutions.

First, civil servants' traditional function as manual processors of requests, forms, and verifications would change to that of data mediator and system watcher. Civil servants would no longer process documents sequentially but would instead interpret system outputs, manage exceptions, and watch algorithm performance. This would not only demand computer literacy but also familiarity with legal and ethical concerns since human intervention is needed to safeguard fairness and accountability.

Second, there would be new hybrid professions. Companies would require AI compliance officers, data protection coordinators, and digital service analysts who can certify that AI systems are in conformity with the law and just. These are professions that blend law, technology, and administration, which is the interdisciplinary condition of contemporary governance[27].

Third, the work of public managers would basically be strategic in orientation. Rather than resource allocation and internal organizational design, local managers would be agents of digital change, charged with artificial intelligence technology adoption, partnership coordination with external institutions (academic or private), and ensuring service delivery is still citizen-centered.

Their leadership style would transition from operational to adaptive and

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[25] Camelia Raluca Voinea (2023), "The Impact of Artificial Intelligence on Public Services in Romania." *Academic Journal of Law and Governance*, no. 11.1-11.2: 21–31. https://doi.org/10.56177/ajlg.11.1.11.2.2023.art.3.

[26] Simona Rotaru, *Understanding Data Privacy Laws for AI in Romania*, Atrium Romanian Law Office. Romanian Lawyers, November 22, 2023, https://theromanianlawyers.com/data-privacy-laws-for-ai-in-romania/, accessed on 10.06.2025.

[27] OECD, *Future of Work*, OECD, 2020, https://www.oecd.org/en/topics/future-of-work.html, accessed on 10.06.2025.

systemic, aligning with agile and data-driven modes of governance.

Finally, citizen interaction with the institution would be enabled through smart interfaces — i.e., chatbots, dashboards, and automatic notifications —requiring a shift away from direct, in-person bureaucratic procedures to asynchronous, platform-based communication. Staff would be compelled to scrutinize feedback, sequence automated processes, and constantly adjust the system based on feedback from citizens[28]. These transformations would not imply automation replacing people, but a redistribution of administrative intelligence: from manual input to interpretative judgment, from repetitive execution to adaptive decision support. Such restructuring, if managed strategically, could elevate the public administration's efficiency, consistency, and responsiveness, particularly in rural or under-resourced areas where capacity gaps are greatest.

7.2. National Interconnection and Systemic Integration: AI4PA as a Public Administration Digital Infrastructure

The AI for Public Administration (AI4PA) national plan project must not be envisioned as a mere standalone technological innovation but as a holistic solution to the condition of extensive fragmentation of digital transformation in Romanian public administration[29]. As a design concept, AI4PA is to be an overarched technology of digital infrastructure that can connect central and local authorities into an integrated system under shared rules on interoperability, algorithmic transparency, and legality. The platform is intended to replace patchwork solutions with nationally integrated operating systems where decision-making procedures, data standards, and mechanisms for the delivery of public services are harmonized across the country.

Such a platform would be able to host decentralized application with a shared legal, ethical, and technical framework. Local institutions would be able to deploy variable modules without sacrificing the fundamental design of the platform, and data interchange would be through normalized protocols, under algorithmic control and real-time audits. Legality in this system would not be a retrospective shield; it would be an intrinsic design criterion built into the system from the outset.

AI4PA would be a redefinition of the administrative action itself. Artificial intelligence-aided decisions would be signed in line with precise legal stand-

[28] Emma Martien Branderhorst, Erna Ruijer (2024), "Digital Leadership in Local Government: An Empirical Study of Dutch City Managers." *Local Government Studies* vol. 51, issue 3: 576-599. https://doi.org/10.1080/03003930.2024.2363368.

[29] Marian Stoica, Bogdan Ghilic Micu (2020), "E-Government in Romania – a Case Study," *Journal of E-Government Studies and Best Practices,* Article ID 608643: 1–12, https://doi.org/10.5171/2020.608643.

ards, traceable and documented, thereby ensuring traceability and contestability[30]. The platform would enable a new decision-making paradigm where the administrative action is digital and legal, automated and responsible, efficient and procedurally legitimate.

Global role models validate this vision. Portugal's AI4PA project, launched with UNU-EGOV's guidance, illustrates how artificial intelligence can be integrated in government institutions without weakening democratic values or legal integrity. Estonia's X-Road system has enabled a fully interoperable digital government system, and Finland's AuroraAI provides predictive public services to major life events. These initiatives provide an integrated reference model for Romania, which could follow a similar trajectory adapted to its own unique institutional and social features.

In principle, AI4PA is an interdisciplinary effort. To develop this project effectively and conceive it properly, a call for collective effort from legal professionals, engineers, public administrators, policy analysts, and social scientists is necessary. Only through such collective effort can a rule-of-law-observing digital structure be constructed that meets the performance demands of modern governance. This platform is not meant to replace public officials, but to enable a redistributive shift of administrative astuteness—to divert it from routine work to judgmental assessment, and from bureaucratic reaction to strategic foresight. Implementation of a system such as AI4PA can make a critical difference in underrepresented or rural areas, where administrative capacity is low and the demand for transparency, efficiency, and accessibility is high. The system would not only facilitate the optimization of means but also the revival of faith in institutions and the minimization of geographic gaps.

Subsequently, AI4PA is more than a technological solution; it is a model of institutional change, that offers a digital platform for a new paradigm of public administration that is integrated, legal, effective, and citizen-centric. This framing is a direct reference to the larger theme of the present conference, showing how multi-disciplinary problems of administrative sciences can be addressed by integrated, forward-looking, and socially applicable projects of the 21st century.

8. Conclusions

Use of artificial intelligence in public administration has shifted from being a future possibility to an urgent requirement, driven by the increasing need for the efficiency of institutions, transparency, and responsiveness. In a world where societal pressures, systemic issues, and rapid digital changes prevail in the

[30] Sorin Lodoabă, Calin Rus, Dacian C Dragos (2025), "The 'Algorithmic Race': Insights from the Romanian public sector," *Italian Journal of Public Law*, vol. 17, issue 2: 735-765, https://www.ijpl.eu/the-algorithmic-race-insights-from-the-romanian-public-sector/.

environment, AI seems to be a major tool for reconfiguring administrative decision-making. But the technological change requires a broad reconsideration of the interface between the public institutions and the citizens and their internal institutional mechanisms. This research contributes to the literature by highlighting the multifaceted and multidisciplinary nature of the digital revolution in public administration, with a focus on the pivotal role of artificial intelligence.

It analyzes the theoretical and legal foundations of AI adoption in the public sphere, as well as its managerial, legal, and institutional implications. The proposed case study, based on the "Eprimăria" project, supports the argument that technical solutions cannot be dissociated from the normative and organizational context in which they are applied. The successful implementation of AI largely depends on the public sector's ability to learn, adapt, and collaborate.

The international models explored — Estonia, Italy, Spain, Slovenia, Germany — demonstrate that coherent digitalization requires more than digital infrastructure: it demands visionary leadership, continuous training of public personnel, and legal frameworks that safeguard citizens' rights without stifling innovation. Romania is at a turning point, where the accumulation of best practices, pilot projects, and strategic reflection can lead to the development of a more agile, transparent, and citizen-centered administration.

In line with the theme of this conference — *the challenges of interdisciplinary approaches in 21st-century administrative sciences* — this paper argues that the future of administration cannot be envisioned outside the dialogue between law, technology, public management, and behavioral sciences. Only through an integrated vision can resilient public systems be built, systems capable of responding to the complex and evolving needs of contemporary society.

Building on the exploratory results of the *Eprimăria* project, we propose the creation of a modular, interoperable framework adaptable to Romanian local administrations. Such a system could evolve into a national platform — *AI for Public Administration* — developed under academic coordination and deployed through partnerships with local authorities. This initiative bridges the gap between experimentation and systemic reform, and places Romania on the path toward a responsible and scalable AI-driven governance.

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