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CHALLENGES OF USING ARTIFICIAL INTELLIGENCE IN THE WORK OF PUBLIC ADMINISTRATION

Summary

In the paper, the author deals with the current issue of introducing artificial intelligence in the work of public administration, as a logical process of upgrading the digital transformation of public administration in a global framework. Starting from the fact that modern public administration is called upon to fulfil several key characteristics: to be efficient, transparent, inclusive, service-oriented, and above all, legally regulated. The author points out that the introduction of digital technologies, automated systems, artificial intelligence and interoperable databases can advance these goals. However, she points out that for the introduction of digital transformation and artificial intelligence in public administration, several assumptions need to be met: the existence of a clear political will for implementation; continuous development of the technical infrastructure; providing big data and interoperability at all levels; educated public servants and citizens to provide and use such services and of course on a clear, predictable and integrated legal framework.
Keywords: digital transformation; artificial intelligence; public administration.

I. Introduction

In this paper, we aim to point out certain basic issues and challenges related to the introduction of artificial intelligence in the work of public administration. The rapid development of new technologies is changing the way people live, affecting everyday life and all professions. New technologies are used and find a place to change the way many professions are performed. They are also applied in the functioning of public administration, so for a long time now we have been talking about the digital transformation of public administration, and we come across the terms e-government, e-governance, etc. It can be said that technological development has transformed public administration in various ways in the last few decades. Just as the classical state administration began to transform into a public service in the 18th century and significantly changed the nature of administrative activity, so public administration in the 20th century has been transformed under the influence of various social factors, among which the emergence of information and communication technologies (hereinafter: ICT) stands out. By the nature of things, the new transformation is only partially of an essential nature, since the pursuit of the public interest and the performance of public services are still the fundamental goals of public administration.

Legal theorists and practitioners agree that modern public administration is called upon to fulfil several key characteristics: to be efficient, transparent, inclusive, service-oriented, and above all, legally regulated. The introduction of digital technologies, automated systems, artificial intelligence, and interoperable databases can advance these goals, but only if implemented on a clear, predictable, and integrated legal framework.

II. Definition of Artificial Intelligence

The term "artificial intelligence" (AI) comes from the English word artificial, which means something created by man and not by nature, and intelligence, which means the ability to learn, think logically, adapt and solve problems. This term first appeared in 1956 at a conference in Dartmouth, where researchers John McCarthy, Marvin Minsky and Allen Newell set the focus: "creating machines that behave like intelligent beings".[1]

In scientific terms, artificial intelligence is an interdisciplinary field that combines computer science, logic, linguistics, cognitive science and engineering to create systems capable of performing

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[1] McCarthy, J., Minsky, M., Rochester, N., & Shannon, C. (1955). *A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence*.

tasks that usually require human intelligence: speech recognition, language translation, visual perception, decision-making and automatic learning. [2]

The development of artificial intelligence can be divided into several phases: the pioneering period (1950–1970) beginning with Alan Turing's theory of a "thinking machine" and the first algorithms for solving logical problems; the period of enthusiasm and stagnation (1970–1990), despite initial interest, technological limitations lead to a decline in investment, known as the "AI winter"; the era of machine learning (1990–2010) the emergence of algorithms for learning from data (machine learning), leading to practical applications in finance, medicine and industry; the modern era (2010–present), the exponential development of artificial intelligence through "deep learning" and the use of large data sets and cloud infrastructure. [3]

III. Challenges of modern public administration

Public administration in the 21st century is being built in conditions of globalization, climate change, information technology boom with the development and application of artificial intelligence, military conflicts, post-pandemic situations and energy crisis. Hence, it is considered that public administration must develop in the direction of technological adaptations (digitalization, AI); development of administrative ethics and accountability; opening to citizens and user-oriented services and improving judicial and parliamentary control. Legal theory also recognizes these challenges as the most significant for modern public administration. “An organizational system that must adapt to digital challenges and European management standards”. [4] Legal theorists believe that “Governance as a concept is particularly important for transitional societies, as it provides an inclusive model of reform and administration focused on results”. [5] Scientific papers emphasize that public administration in the 21st century should focus on "open administration" as a key characteristic of good governance and a prerequisite for digital transformation. [6]

IV. Application of artificial intelligence in the work of public administration

The relationship between digital transformation and artificial intelligence (AI) is essential and interdependent. Digital transformation creates the infrastructure and conditions that enable the application of artificial intelligence, while artificial intelligence is the most advanced expression and driver of that transformation. Their relationship is synergistic, and especially important in the sphere of public administration, where efficient, transparent and personalized public services are expected. In the modern era, digital transformation is emerging as a key force reshaping the landscape of public services. As technology continues to advance at an unprecedented pace, its impact on governance and the experience of citizens is becoming ever more profound. This transformation, driven by innovations such as cloud computing, artificial intelligence (AI), big data analytics and blockchain, is revolutionizing the way governments deliver services, communicate with citizens and make policy decisions. Historically, public services have been characterized by bureaucratic processes, limited accessibility, and inefficiencies that have often hindered effective governance. Traditional methods of service delivery have often involved cumbersome documentation, lengthy approval processes, and a lack of real-time interaction between citizens and government agencies. However, the emergence of digital technologies has introduced new paradigms, offering opportunities for improved efficiency, transparency, and accountability in public service delivery. Digital transformation in public services involves the integration of digital technologies into every aspect of governance. This integration not only streamlines administrative processes but also enables data-driven decision-making that can significantly improve service delivery. For example, the use of big data and AI allows governments to analyse vast amounts of information to better understand citizens’ needs, predict trends, and allocate resources more

[2] Russell, S., & Norvig, P. (2021). *Artificial Intelligence: A Modern Approach*, 4th ed., Pearson, Chapter 1.
[3] Kaplan, J. (2016). *Artificial Intelligence: What Everyone Needs to Know*, Oxford University Press, p. 23–45.
[4] Давитковски Б., Павловска-Данева А. (2020). Административно право – книга втора (процесно право)., Универзитет „Св. Кирил и Методиј“ во Скопје, Скопје,https://www.ukim.edu.mk/e-izdanija/PRF/Administrativno_pravo_II.pdf (last visited on 04.07.2025)., p. 24–26.
[5] Врачар, Д. *Управно право*, Београд, 2021, p. 43.
[6] Koprić, I., Đulabić, V. *Javna uprava*, Pravni fakultet Zagreb, 2020, p 78–83

efficiently. This shift towards data-centric management improves the ability to proactively solve problems and tailor services to meet the specific needs of diverse communities. [7]

Artificial intelligence (AI) is a subset of digital transformation, but it also has an upgraded cognitive meaning. It refers to the ability of computer systems to imitate human thinking, learn from data (machine learning), make decisions, predict scenarios and communicate with users through natural language. In public administration, AI is applied through: chatbots for interaction with citizens; automated decision-making (decision support systems); predictive analysis[8] to identify risks or needs; optimization of administrative processes; detection of fraud and corruption. AI does not replace digitalization but rather builds on it: while digitalization converts documents and processes into electronic form AI enables intelligent processing, interpretation and action on that data.

In various studies and project research on the introduction of the digital transformation of public administration and related to the introduction of AI, the following factors are cited as factors for successful development and implementation: [9]

Political will and stability: countries with a long-term vision and support from a high political level show higher efficiency in the transformation. For example, in Estonia, digitalization has been part of the state strategy since the 1990s, which provides strong institutional continuity. [10]

Infrastructure and technological capacities: countries with well-developed ICT infrastructure have the technical ability to quickly implement advanced solutions, such as AI-systems for automation and analysis. [11]

Institutional capacity and trained staff: the quality and training of public servants are one of the key conditions for successful digitalization and use of AI. In certain countries, although the technical resources exist, administrative resistance and the low level of training of officials slow down the reform. [12]

Inclusiveness and accessibility: Countries that incorporate digital literacy as part of public policies for citizens and administration show higher results. In some countries, digital literacy transformation is accompanied by digital inclusion programs, especially for marginalized groups. [13]

One of the key factors for implementing digital transformation is the existence of a modern legal framework as a basis for this transformation. While the EU has adopted the AI Act (2024), [14] many countries do not have legal prerequisites for its implementation. Without regulation, the risks of discrimination and corruption in automated systems are real. Legal regulations should be aimed at ensuring transparency, ethical use of AI and algorithmic accountability. [15]

Digital transformation and the implementation of artificial intelligence are, as we have already indicated, inextricably linked. It is impossible to implement the use of artificial intelligence if digital transformation is not worked on and it is not systematically implemented. Digital transformation: is a process of systematic introduction of digital technologies, structures and cultures in public administration, to improve internal processes, public services and relations with citizens. Artificial Intelligence: is a complete set of technologies that enable a system to "learn", "think" and act intelligently based on data (machine learning, NLP, computer vision, etc.).

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[7] https://www.researchgate.net/publication/383836540_The_Impact_of_Digital_Transformation_on_Public_Services (last visited on 28.07.2025).

[8] Predictive analytics - using statistics, algorithms, and data to predict future behavior

[9] Yang, C., Gu, M., & Albitar, K. (2024). *Government in the digital age: Exploring the impact of digital transformation on governmental efficiency*. Technological Forecasting & Social Change, 208, 123722; OECD (2021). *The Use of Artificial Intelligence in Public Administration: Practices and Challenges*. ; Pittaway, L., & Montazemi, A. (2020). *Knowledge transfer via public-private partnerships in local governments*.

[10] Yang, C., Gu, M., & Albitar, K. (2024). *Government in the digital age: Exploring the impact of digital transformation on governmental efficiency*. Technological Forecasting & Social Change, 208, 123722. p.7-9

[11] Yang, C., Gu, M., & Albitar, K. (2024). Ib.idem . p.14-16

[12] Yang, C., Gu, M., & Albitar, K. (2024). Ib .idem p. 10

[13] Yang, C., Gu, M., & Albitar, K. (2024). Ib.idem. p .5

[14] Regulation (EU). 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC). No 300/2008, (EU). No 167/2013, (EU). No 168/2013, (EU). 2018/858, (EU). 2018/1139 and (EU). 2019/2144 and Directives 2014/90/EU, (EU). 2016/797 and (EU). 2020/1828 (Artificial Intelligence Act). (Text with EEA relevance).
PE/24/2024/REV/1 *OJ L, 2024/1689, 12.7.2024, ELI: http://data.europa.eu/eli/reg/2024/1689/oj* (last visited on 03.07.2025).

[15] Regulation (EU). 2024/1680 – AI Act, Official Journal of the EU.

Without a digitized database, interoperability standards, e-government infrastructure, as well as integrated management systems, artificial intelligence cannot be effectively implemented in public administration. The process of digital transformation has encompassed broad societal changes – from technological modernization, through institutional restructuring, to the transformation of relations between public administration and citizens. In this regard, research has shown that the legal framework plays an essential role in regulating relations and obligations in digital services, protecting personal data, providing legal remedies in the digital environment, and ensuring legal certainty for all entities in digital governance.

When we talk about the legal framework regarding digital transformation and the introduction of artificial intelligence into the work of public administration in the European Union, Article 114 of the Treaty on the Functioning of the EU[16] and the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Strengthening the European Administrative Area (ComPAct) are a key basis for further regulating these procedures. [17]

In the European Union, digital transformation is being implemented under a clearly defined legal framework, which includes: Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation - GDPR) [18] Regulation (EU) No. 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC, [19] Regulation (EU) 2018/1724 of the European Parliament and of the Council of 2 October 2018 establishing a single digital gateway to provide access to information, procedures and assistance and problem-solving services, and amending Regulation (EU) No. 1024/2012 [20] , Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act) [21], Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data (Data Act) [22] Directive (EU) 2022/2555 of the European Parliament and of the Council of 14 December 2022 concerning measures for a high common level of cybersecurity across the Union , [23] Regulation (EU) 2024/1183 of the European Parliament and of the Council of 11 April 2024 amending Regulation (EU) No. 910/2014 establishing

[16] Consolidated versions of the Treaty on European Union and the Treaty on the Functioning of the European Union Consolidated version of the Treaty on European Union Consolidated version of the Treaty on the Functioning of the European Union Protocols Annexes to the Treaty on the Functioning of the European Union Declarations annexed to the Final Act of the Intergovernmental Conference which adopted the Treaty of Lisbon, signed on 13 December 2007 Tables of equivalences *OJ C 202, 7.6.2016, pp. 1–388* https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2016_202_R_0001 (last visited on 23.07.2025).

[17] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023DC0667&pk_campaign=preparatory&pk_source=EURLEX&pk_medium=TW&pk_keyword=Public%20administration%20&pk_content=Communication&pk_cid=EURLEX_news (last visited on 03.07.2025).

[18] Regulation (EU). 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation). OJ L 119/1

[19] Regulation (EU). No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC : 23.07.2014 , OJ L 257/73

[20] Regulation (EU). 2018/1724 of the European Parliament and of the Council of 2 October 2018 establishing a single digital gateway to provide access to information, to procedures and to assistance and problem-solving services and amending Regulation (EU). No 1024/2012 , 2.10.2018 | OJ L 295/1

[21] Regulation (EU). 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU). 2018/1724 (Data Governance Act). Објавена: 3.6.2022 | OJ L 152/1

[22] Regulation (EU). 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data (Data Act). 22.12.2023 | OJ L 352/1

[23] Directive (EU). 2022/2555 of the European Parliament and of the Council of 14 December 2022 on measures for a high common level of cybersecurity across the Union (NIS2 Directive). : 27.12.2022 | OJ L 333/80

a framework for a European Digital Identity Card, [24] the EU Strategy, the European Declaration of Digital Rights and Principles (2023), [25] and the Artificial Intelligence Act (AI Act, 2024). [26]

In the context of public administration, artificial intelligence is starting to be used to improve public services, automate administrative processes, improve transparency, and make decisions. The European Union, through its Digital Agenda for Europe and the eGovernment Action Plan, clearly indicates that AI should serve as a tool for human-centric administration.[27]

Key areas of application of (AI) AI in the public sector are: automation of procedures: through intelligent bots and automatic data processing systems (e.g. in issuing permits and licenses); forecasting and analysis: use of AI to predict social trends (such as urban migration or social assistance needs); digital assistants: chatbots and virtual assistants in contact centers of public institutions (e.g. in tax or health administration); Corruption prevention: identifying irregularities through analysis of transactions and activities. [28]

One of the most direct applications of artificial intelligence in public administration is the automation of administrative procedures. This involves the digitalization and automation of routine tasks – for example, issuing permits, administrative certificates, social benefits or building licenses – through systems that, based on predefined rules (rule-based AI) or data learning models (machine learning), make automatic decisions.

For example, the Estonian X-Road system enables fully automated data exchange between institutions and automated processing of requests. In Finland, AI-based systems enable the assessment of eligibility for social programs. [29].

This not only increases efficiency and reduces the need for human intervention but also provides legal certainty and standardization of procedures.

AI systems can analyse large amounts of data (big data analytics) to predict social trends or future needs. For example, by analysing demographic and economic data, it is possible to predict the need for social care, migration flows, increased demands for educational or health services, or the risk of unemployment by region.

In the Netherlands, local authorities apply predictive models to identify areas with an increased risk of poverty or lack of access to services. [30]

In Denmark, the digital assistant "Borger.dk Assistant"[31] answers questions related to health, taxes, education and other administrative topics. In Canada, the digital agent "GC Assistant" helps citizens navigate the federal administration. [32]

These tools significantly reduce the administrative burden on officials and increase the availability and quality of public services, especially for people with limited access to traditional channels.

AI tools are increasingly being used to identify irregularities, abuses and corruption patterns, by analysing large data sets on tenders, transactions, budget expenditures and public procurement.

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[24] Regulation (EU). 2024/1183 of the European Parliament and of the Council of 11 April 2024 amending Regulation (EU). No 910/2014 as regards establishing a framework for a European Digital Identity

[25]https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32023C0123(01). (last visited on 23.07.2025).).

[26] Regulation (EU). 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC). No 300/2008, (EU). No 167/2013, (EU). No 168/2013, (EU). 2018/858, (EU). 2018/1139 and (EU). 2019/2144 and Directives 2014/90/EU, (EU). 2016/797 and (EU). 2020/1828 (Artificial Intelligence Act). (Text with EEA relevance).
PE/24/2024/REV/1 *OJ L, 2024/1689, 12.7.2024, ELI: http://data.europa.eu/eli/reg/2024/1689/oj* (last visited on 23.07.2025).).

[27] European Commission (2020). *Shaping Europe's Digital Future*, COM(2020). 67 final.

[28] Wirtz, B. W., Weyerer, J. C., & Geyer, C. (2019). *Artificial Intelligence and the Public Sector—Applications and Challenges*. *International Journal of Public Administration*, 42(7)., p. 596–615.

[29] European Commission (2020). *eGovernment Benchmark Report*. Luxembourg: Publications Office of the European Union, p. 45–46

[30] Noordt, C., & Misuraca, G. (2022). *Artificial Intelligence for the Public Sector: Opportunities and Challenges*, *Government Information Quarterly*, 39(1).

[31] https://lifeindenmark.borger.dk/?cookiebanner=true (last visited on 23.07.2025)

[32]OECD (2020). *Digital Government Review: Denmark – Enhancing Public Sector Digital Transformation*, p. 68–70.

In Brazil, the "Rosie" system (AI bot) analyses documents from the legislature and flags suspected cases of misuse of public funds. [33] In Italy, the "OpenCoesione" platform provides open data on EU funds spending and enables AI-supported oversight.[34]

AI is proving to be a powerful instrument for increasing transparency, accountability, and good governance, and thus for increasing citizens' trust in institutions.

Such models enable institutions to proactively plan policies, rationally allocate resources, and prioritize interventions.

Chatbots are one of the most visible forms of AI in public administration. They enable 24/7 availability of information and facilitate communication between citizens and institutions.

Table 1: Application of AI in the work of public administration

Sector	AI Tools/Examples
Government	Policy Analysis, Solution Automation (e.g., Licensing)
Public services (health, education)	Predictive models for prevention, personalized learning paths
Communal service	Waste optimization, smart lighting, chatbots for reporting

V. Instead of a conclusion

The application of artificial intelligence is not an isolated technological move, but a logical step within a comprehensive digital transformation. Without a stable digital foundation, legal framework and ethical standards, AI cannot be used in a responsible and effective manner in public administration. This means that all the challenges, factors and conditions that existed for a successful digital transformation are also important for the implementation and use of artificial intelligence in public administration.

For the successful application of AI in public administration, the first assumption is a stable, secure and interoperable ICT infrastructure (data lakes, cloud services, open APIs). For example, the X-Road system in Estonia enables the digital connection of all public institutions and paves the way for AI solutions.[35]

The second assumption is that there is data to process. If there is no quality and accessible data, AI cannot function properly, AI algorithms learn from data. Mass collection, processing and standards for data exchange are required, but with respect for the GDPR, the AI Act and national regulations. [36]

To safely use artificial intelligence, it is necessary to have a clear legal framework. The legal framework must define: the competencies and responsibilities when using AI; the rights of citizens in relation to automated decisions; testing, transparency and explainability of algorithms and obligations for supervision and audit of AI systems. When using AI in public services, ethical and social standards and the principles of fairness, non-discrimination, equality in access to services and human control must be respected. The principles of administrative procedure that apply in analogous procedures must be fully respected and applied when using AI in the work of public administration. Everything that is not allowed, everything that is prohibited and punishable so far is also applied appropriately when using AI. Ethics and human control must be applied when using AI in the work of public administration.[37] Digital literacy and organizational culture are one of the basic assumptions for introducing artificial intelligence in public administration. This literacy is necessary for both officials and citizens. Introducing AI requires public administration to have trained personnel, as well as managerial support for innovation. Without this, AI in the work of public administration will remain just a pilot project. [38]

[33] Transparency International (2021). *Using Artificial Intelligence to Combat Corruption*, Policy Paper No. 05/2021, стр. 11–13

[34] https://opencoesione.gov.it/en/ (last visited 27.08.2025)

[35] https://e-estonia.com/solutions/interoperability-services/x-road/ (last visited on 23.07.2025)

[36] European Data Strategy (2020)., *Shaping Europe's Digital Future*, p. 6–7.

[37] OECD (2021). *The Path to Becoming a Data-Driven Public Sector*, p. 45.

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6. https://lifeindenmark.borger.dk/?cookiebanner=true (last visited on 23.07.2025);
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16. PE/24/2024/REV/1 *OJ L, 2024/1689, 12.7.2024, ELI: http://data.europa.eu/eli/reg/2024/1689/oj* (last visited on 03.07.2025);
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3. Regulation (EU). 2018/1724 of the European Parliament and of the Council of 2 October 2018 establishing a single digital gateway to provide access to information, to procedures and to assistance and problem-solving services and amending Regulation (EU). No 1024/2012 , 2.10.2018 | OJ L 295/1;
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