

Artificial intelligence in administration and public management

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Abstract: The use of artificial intelligence in public service and government administration offices is continuously growing. The research aims to highlight the integration of artificial intelligence in the public administration of different states. Document analysis and case analysis were used and statistical data from the Eurostat have been processed. The research results confirm the accelerated and successful penetration of artificial intelligence applications in various fields of public and private interest. Research can serve to develop the content of government policies and the systematic financing of national and local programs for the integration of artificial intelligence in public administration to become more efficient, transparent, and sustainable.

Keywords: public administration; artificial intelligence; public policies; public services.

JEL: L38; M15; N70; O38; O39

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Introduction

In the last decade, artificial intelligence (AI) has presented a major interest in the policies of states around the world to improve the quality of life, economic performance, and public services through innovative technologies (Craglia et al., 2018). The massive investments of some developed states in technological education, equipment, and software, strengthening national digital ecosystems to prepare for the next industrial revolution presents a favorable context that offers national and international opportunities for cooperation and contribution of all entities with an interest in the use of artificial intelligence (Calisto et al. 2023; Souza et al., 2020). In 2018, the European Commission launched the European Strategy on AI, with fundamental objectives related to the adoption of AI throughout the economy and by the public and private sectors, preparing society for the transformations generated by AI and overseeing the operation of an appropriate ethical and legal framework that responds the EU's technology vision and values (Bannister & Connolly, 2014) The use of this technology in public services can bring considerable benefits, but also potential risks (Arghir, 2024; Zhang, et al. 2024). One

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of the major advantages of integrating AI into the work of civil servants is increased efficiency (Engstrom et al., 2020). Administrative processes, which can often be laborious and time-consuming, can benefit from automation, allowing officials to focus on complex issues and strategic decision-making. AI can also provide faster and more accurate data analysis, facilitating evidence-based public policymaking. However, the risks associated with the use of AI in the public sector cannot be ignored. One concern is related to possible discriminatory or unfair decisions made by algorithms, which may reflect biases in the datasets used to train them. It is essential to implement monitoring and regulatory mechanisms to prevent such situations and ensure transparency in the decision-making process.

For senior government officials, the integration of AI can bring significant improvements in resource management and high-level decision-making (Piekut & Rybaltowicz, 2024). However, it is crucial to ensure that the decisions taken by these leaders are accompanied by a deep understanding of the social and political context (Krafft et al., 2019; Eggers et al., 2017). Technology can facilitate the decision-making process, but it cannot completely replace human judgment. These are the premises from which this research starts. The research questions answered by the paper are: Where and why can artificial intelligence applications be used in public administration? What are the best practices, main benefits, and risks of integrating AI?

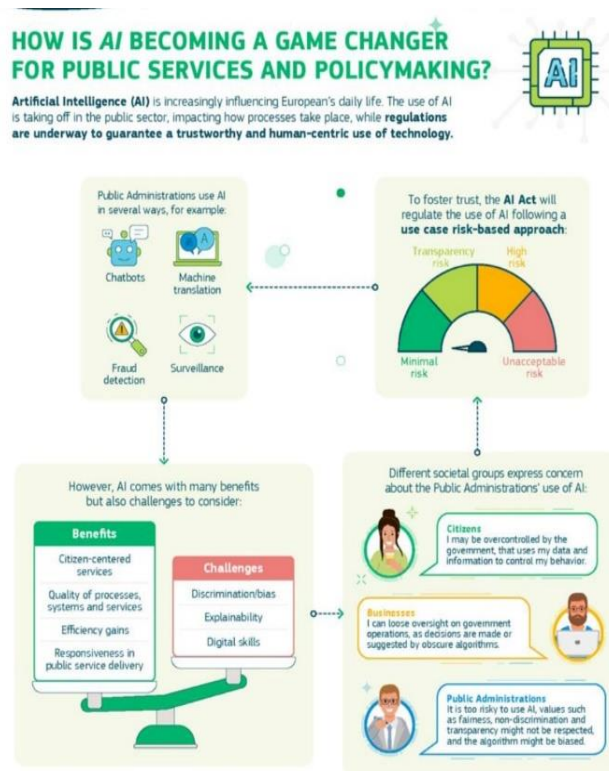
The paper is structured in six sections. They are about artificial intelligence in the literature, content, tools, factors, principles, benefits, and risks followed by some of the relevant examples of countries that have integrated artificial intelligence applications and achieved outstanding performance (Chang & Ku, 2023). The work contains the main coordinates of the European Union's strategy regarding artificial intelligence. The paper ends with some risks and challenges determined by artificial intelligence and conclusions.

1. Artificial intelligence in the literature

Artificial intelligence refers to systems that exhibit intelligent behaviors by analysing their surroundings and taking action - with some degree of autonomy - to achieve specific goals. Starting from this definition derives the idea that AI has the immediate ability to transform the environment and the way humans interact and collaborate with technology (Kmecová & Androniceanu, 2024; Belas et al, 2024; Kő et al, 2023). Artificial intelligence is mostly a set of high-complexity algorithms developed by humans that can be similarly applied in different domains as long as large datasets or work scenarios are available. That is why the directions in which the new algorithms are developed must include information on the transparency and impartiality of the decisions made, their explanation, as well as methods of direct human intervention in the process of running automatic systems. This interaction must be seen in the context of a significant improvement in the way people live and work. Artificial intelligence and robotics currently represent the emerging

benchmark technologies towards which most nations are focusing large components of their human and financial resources, to maximize the exploitation of the context of opportunities offered by these technologies. According to Hila Mehr of the Ash Center for Democratic Government and Innovation at Harvard University, since the late 1990s the US Postal Service has used automated methods to recognize handwriting on envelopes so that it can automatically route letters. The rapid global development of the field in recent years is proof of its strong potential to generate a new technological revolution shortly, with significant impact and results in all areas of life, from education, medicine, agriculture, culture, and entrepreneurship, to the daily organization of social interactions. AI facilitates the collection and data aggregation, computer analysis and processing power, navigating the environment through image understanding, natural language processing and understanding (speech recognition and synthesis, etc), sensor technology, robotics and others. Figure 1 shows how artificial intelligence in Europe become a relevant support for public services and policymaking (Kolkman, 2020).

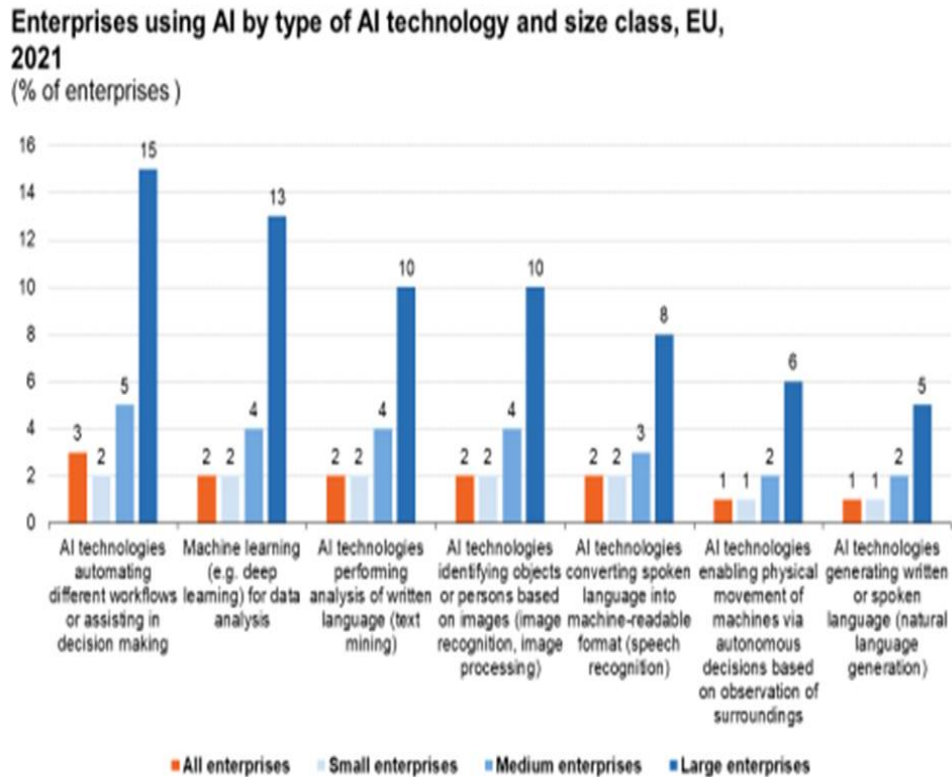
Figure 1. Artificial Intelligence support for public organizations



Source: European Commission, Joint Research Centre (JRC) [Dataset] PID: <http://data.europa.eu/89h/7342ea15-fd4f-4184-9603-98bd87d8239a>

All automation processes lead to issues regarding the ethics and sustainability of the technology (Peña et al., 2023; Machova et al., 2023). At the same time, by intertwining these two fields, starting from the opportunities to automate repetitive, mechanical, error-prone processes that do not directly produce added value, the human creative potential will truly find its supporting pillar. In the private sector (Dvorsky et al., 2023; Belas & Rahman, 2023), there are already proven performances and trends of continuous growth and diversification of the integration of artificial intelligence applications, as can be seen in Figure 2.

Figure 2. Artificial Intelligence within the private sector in Europe



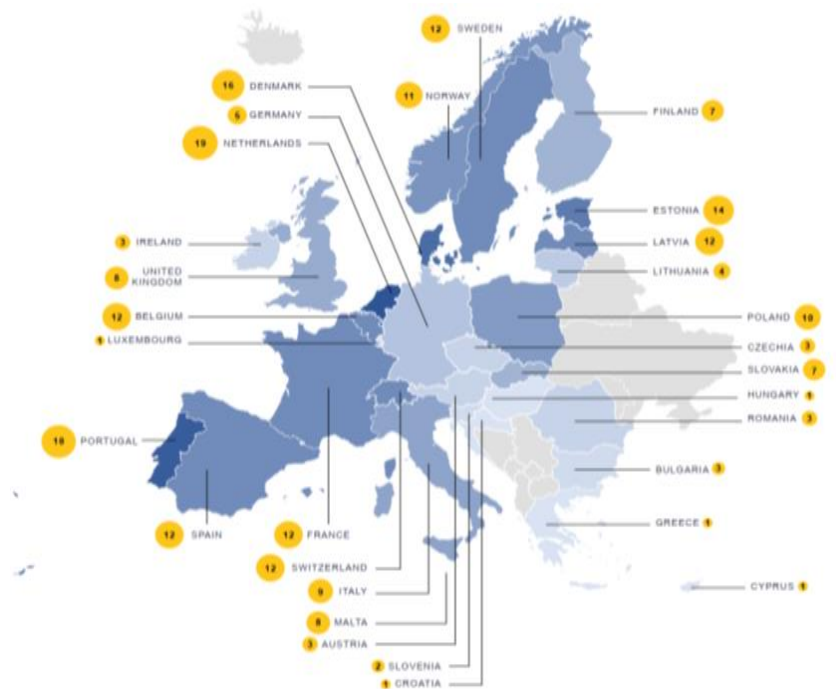
Source: Eurostat (online data code: isoc_eb_ai)



Source: European Commission, Joint Research Centre (JRC) [Dataset] PID: <http://data.europa.eu/89h/7342ea15-fd4f-4184-9603-98bd87d8239a>

The developed countries of the world are already massively investing human and financial resources in the field of artificial intelligence, realizing the innovative capabilities of AI that will lead to the next global technological revolution. Figure 3 presents a mapping of the EU countries using AI.

Figure 3. Mapping the AI in Europe



Source: European Commission, Joint Research Centre (JRC) [Dataset] PID: <http://data.europa.eu/89h/7342ea15-fd4f-4184-9603-98bd87d8239a>

The main AI typologies used by different European states are Security Analytics and Threat Intelligence; Predictive Analytics, Simulation and Data Visualisation; Natural Language Processing, Text Mining and Speech Analytics; Machine Learning, Deep Learning; Expert and Rule-based Systems, Algorithmic Decision Making; Computer Vision and Identity Recognition; Cognitive Robotics and Process Automation, Connected and Automated Vehicles; Chatbots, Intelligent Digital Assistants, Virtual Agents and Recommendation Systems; Audio Processing; AI-empowered Knowledge Management.

2. Principles underlying the development of AI-based technologies

The main principles of AI-based technologies are presented further.

1. Respect for human rights and democratic values. These include freedom, dignity, autonomy, confidentiality, protection of data and privacy, non-discrimination and equality, diversity, fairness, social justice, and internationally recognized labor rights.

2. Human-centered, inclusive, non-discriminatory, and unbiased AI. The principle conveys the idea of applying AI under the control of human intelligence and action as the final actor in decision-making. Accountability over AI must also be ensured

so that fundamental and social rights are respected, including the right not to be discriminated against through the algorithms applied.

3. Diversity, equal opportunities, and gender. AI systems must be user-centric and designed in a way that allows anyone to use AI products or services, regardless of age, gender, abilities or characteristics.

4. Transparency and trust. The principle refers to the fact that both the data and the processes of processing them are known enough so that their source can be traced and also can determine trust in systems and applications. The need to explain both the technical processes and the reasoning behind the decisions or predictions the AI system makes is mentioned. Citizens' trust is inextricably linked to the right to understand algorithms and the ability to challenge any decision that affects their lives.

5. Robustness, security and safety (Kovács, 2022). The resilience and response capacity of systems in risk or threat situations is expressed. The principle covers design or technical defects, interruptions, misuse, or malicious use, as well as attacks, the elimination of adverse, critical, or harmful effects (eg for human or societal safety) in the event of cyber attacks.

6. Liability requires a mechanism for implementation.

7. Partnership. State can be an active partner and contributor at the European and global levels, through the development of original projects and international partnerships for regional, European and global benefit (Kowalska & Bieniek, 2022).

2. Main benefits of the Artificial Intelligence

The potential benefits of artificial intelligence in modern society are numerous from the perspective of improving the quality of life, the results of economic activity and the functioning of the labor market, and the proximity between public authorities and citizens (Ginevičius, 2023; Kronemann et al., 2019). Through the capabilities of data processing, work scenarios, language processing, robotics, and other areas of technology, the benefits of AI adoption are evident in all sectors. The public sector can benefit from multiple advantages, such as: (i) improving the services offered and increasing the degree of public satisfaction; (ii) the development of employees' digital skills; (iii) the implementation of solutions for accessing the interested public and companies to open databases in different fields. The academic environment benefits from advantages such as participation in educational or research projects in the field of AI that lead to: (i) improving computing capacity and infrastructure in general; (ii) the development of master's and doctorate programs, which generate new research and development opportunities; (iii) the opening to new techniques for experimenting and testing the applications resulting from the research carried out; (iv) interconnection to European centers and implicitly to their logistics, as well as access to data sets and knowledge (Shava & Vyas-Doorgapersad, 2023). Private companies can benefit from important advantages such as the following: (i) participation in national and European financing projects or cooperation within

innovative HUBs; (ii) improving logistics in general and computing infrastructure in particular; (iii) access to knowledge and information by connecting with different research centres and, implicitly, partnerships with a diversity of researchers. Access to databases for research and testing, as well as testing and experimentation spaces in digital innovation centres (Hinings et al,2018). Increased efficiency, which automatically leads to cost savings (for example, by reducing staff in certain departments such as the front office). Deloitte estimated that automation could save between \$3.3 billion and \$41.1 billion per year in the US. By using AI in public administration, employees can be redeployed to more creative tasks, such as those that require lateral thinking or empathy, and that offer more satisfaction. Reducing the risk of corruption is another important benefit of AI.

4. The EU legislative framework and strategy on artificial intelligence

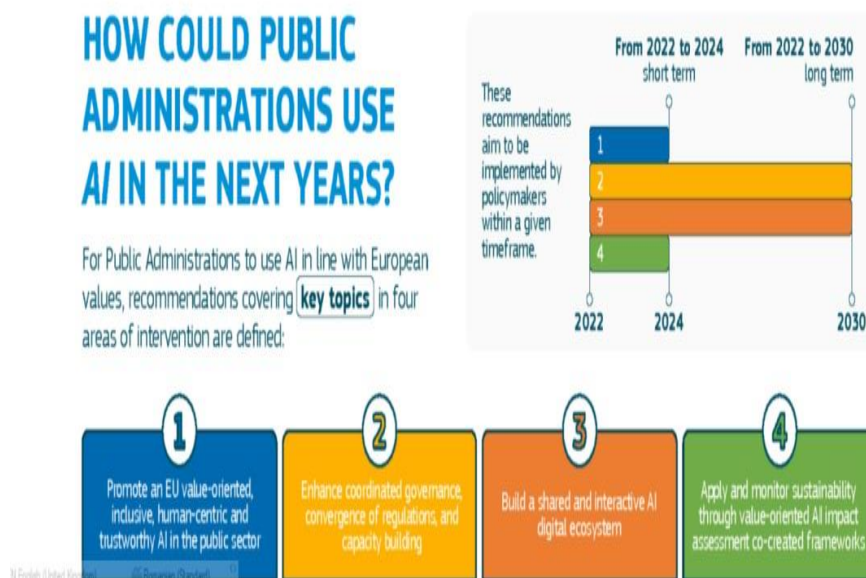
The basic pillars of AI regulation at the EU level are: European AI Strategy of April 2018 (COM (2018)237); Artificial Intelligence for Europe (SWD (2018)137); White Paper on Artificial Intelligence – A European Approach to Excellence and Trust (2020); EC Data Communication, 2020 (COM (2020) 66); Coordinated Plan on Artificial Intelligence from April 2021; Digital Education Action Plan 2021-2027 ((COM (2020) 0624). These documents establish the objectives of the European strategy regarding AI, along the lines of strengthening the technological and industrial capacity of the EU, preparing for the changes generated by AI, ensuring an appropriate ethical and legal framework and pursuing a unitary approach at the EU level (Hernandez Quiros et al., 2023). In terms of policies in the field of AI at the EU level, the regulation of AI is highlighted as a key dimension in the Union's strategy, with the objectives of having safe AI systems on the market and in compliance with the applicable legislation, with the fundamental rights and values of the Union, ensuring legal security for facilitate investment and innovation in AI (Zikhali et al., 2023). Another key element of AI policies aims to improve and acquire new skills (through the Skills Agenda for Europe), including actions in the field of training opportunities, job identification, the development of national skills strategies, a adaptations to future requirements and demands in the process of professional training (the so-called "jobs of the future"), of cooperation between higher education and research-development institutions, of increasing the number of graduates in the STEM and entrepreneurial fields, as well as of improving the conditions that to facilitate investments in skills at the level of the Member States. The EU's New Agenda for Higher Education aims to eliminate skills mismatches and their contribution to innovation and inclusion. The governments follow the EU's vision on the need and directions of preparing citizens for technology with an ever-increasing role in everyday processes and activities (Adeniran et al., 2023).

The AI ACT reviews the sectors considered to be a priority for AI regulation and where the EU can achieve a world-leading position, namely: transport, healthcare and manufacturing (Chilunjika & Uwizeyimana, 2024). Also, increasing importance is given to the financing of AI investments, starting with the introduction of the field under the Horizon 2020, Horizon Europe and Digital Europe Programmes. Medical assistance, safe transport, public services, improving working conditions,

implementing the concepts of green, sustainable, resilient cities and combating climate change are other areas in which AI will be progressively integrated (Brodny & Tutak, 2023; Khan et al., 2023).

Overall, the EU strategy on AI in public administration focuses on strengthening knowledge and resources in the field, to make public administration more efficient and more oriented to the needs of citizens through the intelligent use of emerging technologies (Centre for Public Impact, 2017). The European Union (EU) has outlined a strategy regarding artificial intelligence. The EU Digital Innovation Knowledge Hub contains (1) thematic groups; (2) digital Innovation; (3) a focus on Public Administration and AI integration; (4) collaboration and Exchange of Experience with several stakeholders. The uses of artificial intelligence in public administration in the next years can be seen in Figure 4.

Figure 4. Artificial Intelligence in public administration

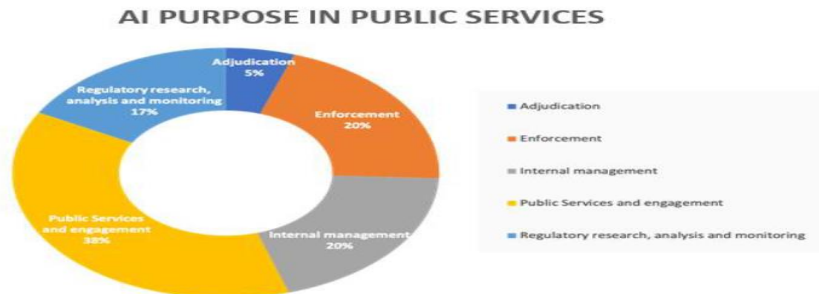


Source: European Commission, Joint Research Centre (JRC) [Dataset] PID: <http://data.europa.eu/89h/7342ea15-fd4f-4184-9603-98bd87d8239a>

Below are some examples of ways in which AI helps to achieve public policy objectives: (1) receiving unemployment, death, or birth benefits, as well as pensions, almost immediately, in an automated way (without requiring any action on the part of the cities); (2) provision of social insurance services; (3) classification of calls to 112 according to the degree of urgency; (4) detection and prevention of the spread of diseases; (5) assisting civil servants in making social payments; (6) social media monitoring for feedback on public policies; (7) monitoring social networks to

identify emergencies; (8) identification of violations in the field of sanitary regulations; (9) offering personalized education to students and so on. In terms of supporting public interactions with the government, artificial intelligence can be used to help members of the public interact with the government and access public services. Thus, artificial intelligence in public administration can: (1) answer questions using virtual assistants or chatbots; (2) direct questions to the appropriate area within the government; (3) fill out forms; (4) search inside documents; (5) schedule meetings. Figure 5 contains the main AI purposes related to public services. Challenges can be technological or social (citizen trust in applications incorporating AI).

Figure 5. AI purposes for public services



Source: European Commission, Joint Research Centre, Misuraca, G., Noordt, C., *AI watch, artificial intelligence in public services – Overview of the use and impact of AI in public services in the EU*, Publications Office, 2020, <https://data.europa.eu/doi/10.2760/039619>

3. Good practices for integrating AI in public administration

Below are some examples of virtual assistants or chatbots used in public administration. As of 2016, the Australian Taxation Office has a virtual assistant on its website called Alex (Montero & Parga, 2023). It can answer more than 500 questions, and by 30 June 2017 had participated in more than 1.5 million conversations, resolving more than 81% of taxpayers' problems at first contact (Faulkner & Kaufman, 2018). Also in Australia, the Department of Social Services virtual assistants on its website, which answer the questions of Internet users (Lazaroiu et al., 2023; Latzer & Just, 2020). Starting in December 2018, a virtual assistant named Sam can answer general questions about family, available jobs, student payments and other related information about recreational activities (Tung & My, 2023).

Other examples of AI in public administration are provided in the paper "Artificial Intelligence in the Public Sector", carried out in partnership by the World Bank, GovTech Global Partnership, and the governments of Austria, South Korea and Switzerland.

In the US, artificial intelligence has been used to analyze citizen feedback on the Government's NetNeutrality policy (this refers to the principle that internet providers must treat all users and content creators equally). 21 million comments were analyzed.

In Armenia, artificial intelligence was used to increase the revenue collected by the Tax Office by 6 times. The technologies used to implement the project were supported by the World Bank.

AI has been used in Brazil in the field of fraud investigation and prevention. AI detected 500 firms owned by civil servants who were tasked with overseeing these companies. The program was also financed by the World Bank.

In the UK, through automated processing with the help of robots, 30,000 pension claims were analyzed in 2 weeks and more than 2 million web pages offered services to the citizens.

AI is currently being used by various regulatory authorities and financial institutions in various countries around the world to track illicit financial flows, estimated at \$80 billion in Africa alone (Tsheola et al., 2023; Sibiyi & Vyas-Doorgapersad, 2023). Priority sectors for the use of AI were outlined, such as infrastructure and transport, RDI, health, e-government, education, ICT, agriculture, defense and national security, considered to have the most benefits (Cordella & Iannacci, 2010). Another relevant sector is the one related to the environment, through the support that artificial intelligence technologies can bring in combating the risks due to climate change and preventing and managing the dangers produced by natural disasters and climate change (Zecca et al., 2023). Also, in terms of AI applicability technologies, algorithmic decision-making tools, process automation, cognitive robotics, expert and rule-based systems, machine learning, predictive analytics, intelligent digital assistants, and facial recognition through means were highlighted video. The public consultation had an essential role in the formulation of the SN-IA as it validated the conceptual premises, ensured consistent feedback related to the presented vision and a unitary reference base for outlining the general and specific objectives as well as the measures.

4. Performance of AI integrated in public administration

Vienna becomes the first city in the world to be certified by the IEEE for ethics in artificial intelligence (AI). The certification is awarded in recognition of the city's "digital humanism" strategy. Vienna was evaluated according to the IEEE standards for ethics in AI and received approval as an example of best practices in the implementation of digital technologies. The article highlights Vienna City Hall's commitment to the development and responsible use of emerging technologies. "Compass for the Use of Generative Artificial Intelligence (AI) in a Work-Related Context" is a document developed by the AI Competence Network, led by the Executive Group for Organization and Security, MD-OS, on August 21, 2023. The purpose of this document is to serve as a guide for officials of the City of Vienna

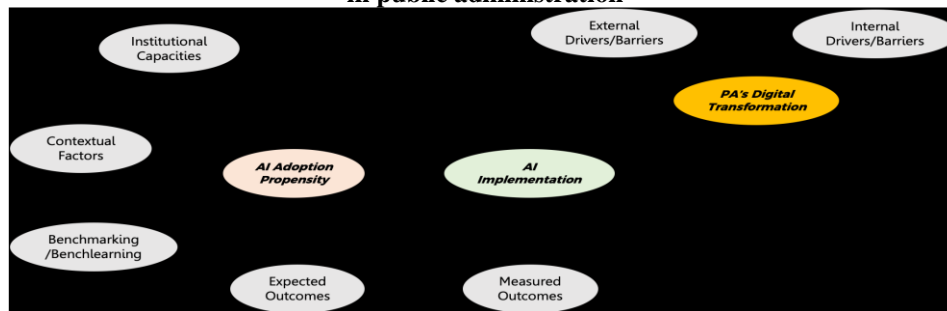
administration on the responsible use of generative artificial intelligence technologies in the professional context (Androniceanu, 2024). Generative AI is presented as a technology capable of generating text, images, video, audio, etc., combining machine learning models and existing data to produce new results. The paper highlights the enormous potential of the technology, but also the challenges associated with implementing and managing its results.

The basic principle is personal responsibility, knowledge and experience. The use of generative AI tools available on the Internet is permitted under the applicable decrees and guidelines, is considered inevitable in a modern and efficient administration. Employees are encouraged to act responsibly, use knowledge and common sense when working with these technologies, and respect the principles of legality, efficiency and practicality, as well as ethical standards. In this context, the user's responsibility in verifying and authenticating the content generated by AI becomes essential, with special emphasis on the prevention and management of deepfakes and misinformation. In addition, criteria are provided for identifying content authenticity, promoting the need for source verification and discernment in the use of AI results in decision-making processes. The "Compass for the Use of Generative Artificial Intelligence (AI) in a Work-Related Context" provides a guiding framework for Vienna city administration officials in adopting and responsibly managing generative AI technologies in their work environment. The document emphasizes the importance of digital ethics and promotes a conscious and balanced approach to the integration of these emerging technologies.

5. Factors that are influencing the integration of AI in public administration

Structural factors affecting artificial intelligence in the public sector, as can be seen in Figure 6.

Figure 6. The main factors that influence the integration of AI in public administration

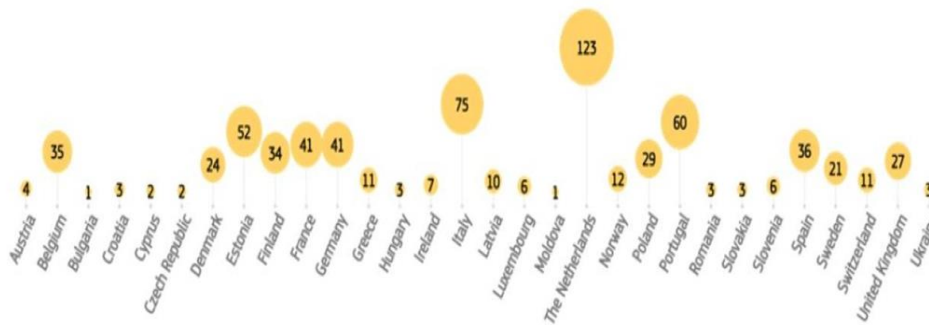


Source: European Commission, Joint Research Centre (JRC) [Dataset] PID: <http://data.europa.eu/89h/7342ea15-fd4f-4184-9603-98bd87d8239a>

On the same level can be seen the need to regulate AI systems, so that their applicability and use ensure respect for the fundamental rights of citizens and

provide confidence regarding ethical aspects (regarding the potential impact on integrity, autonomy, independence, legality and freedom of the person). Applications developed based on AI must work for the benefit of people, without discriminating and without affecting the safety and rights of people, which are desirable for the development of trustworthy AI applications (Zsigmond & Mura, 2023; Zsigmond et al., 2024; Katina et al., 2023). As a result, the impact of AI is substantial, in the new economic, social, and technological context, bringing both benefits and risks likely to influence the quality of life or conditions of security, safety, health and ethics (Bullock et al., 2020). Figure 7 contains a mapping of using AI in the public sector in Europe.

Figure 7. Mapping the use of AI in the public sector in Europe



Source: Tangi et al., 2022

It is increasingly evident that AI will be the engine behind many major changes soon (Paulikas & Paulikienė, 2022). Therefore, the main role of the authorities is to facilitate, direct and manage the development of AI. AI tools are becoming more and more important, leading to the need for digital and technological transformation of society through AI. In many countries in Europe and worldwide, the advantages it has have been proven and efforts are being made to overcome systemic deficiencies and economic risks. AI will contribute to the development of state administrations in the future.

6. Conclusions

The research highlights that the integration of AI in public administration remains unequal in Europe and over the world. From the point of view of AI standardization activity, the strongest development trends are in the following areas: 5G systems, network optimization, IoT, data acquisition and management, security and privacy, and health and societal applications. It is intended to develop European and international standards aimed at terminology, use cases, the impact of EU ethics

guidelines, interoperability, establishing key performance indicators and compliance assessment schemes, and systems maturity assessment.

Conflict of interest

The author declares that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

- Adeniran, A. O., Muraina, J. M., Ilugbami, J. O., and Adeniran, A. A. (2023). Government policy: meaning, types, manifestations, theories, and policy cycles. *Insights into Regional Development*, 5(2), 83-99. [https://doi.org/10.9770/IRD.2023.5.2\(6\)](https://doi.org/10.9770/IRD.2023.5.2(6))
- Androniceanu, M. (2024). The Alfresco platform, a viable and sustainable strategic option for document management. *Management Research and Practice*, 16(1), March, 46-54.
- Arghir D.C. (2024). From ancient streets to connected cities: analyzing the implementation of smart initiatives in Romania. *Theoretical and Empirical Researches in Urban Management*, 19(2), May 2024, 5-27.
- Bannister, F., Connolly, R. (2014). ICT, public values and transformative government: A framework and programme for research. *Government Information Quarterly*, 31(1), 119-128. <https://doi.org/10.1016/j.giq.2013.06.002>
- Belas, J., Machova, R., Olah, J., and Metzker, Z. (2024). The impact of selected HRM factors on company's survival of SMEs: Empirical research in V4 countries. *Journal of International Studies*, 17(1), 108-123. doi:10.14254/2071- 8330.2024/17-1/7
- Belas, J., Rahman, A. (2023). Financial management of the company. Are there differences of opinion between owners and managers in the SME segment? *Journal of Business Sectors*, 1(1), 1-9. <https://doi.org/10.62222/UQAH6943>
- Brodny, J., Tutak, M. (2023). The level of implementing sustainable development goal "Industry, innovation and infrastructure" of Agenda 2030 in the European Union countries: Application of MCDM methods. *Oeconomia Copernicana*, 14(1), 47-102. <https://doi.org/10.24136/oc.2023.002>
- Bullock, J., Luccioni, A., Pham, K. H., Lam, C. S. N., and Luengo-Oroz, M. (2020). Mapping the Landscape of Artificial Intelligence Applications against COVID-19. *ArXiv Preprint*, 1-32. <http://arxiv.org/abs/2003.11336>
- Calisto, M. de L., Costa, T., Afonso, V. A., Nunes, C., and Umbelino, J. (2023). Local Governance and Entrepreneurship in Tourism – a Comparative Analysis of Two Tourist Destinations. *Journal of Tourism and Services*, 14(27), 22-38. <https://doi.org/10.29036/jots.v14i27.404>
- Centre for Public Impact. (2017). *Destination unknown: Exploring the impact of Artificial Intelligence on Government*. <https://resources.centreforpublicimpact.org/production/2017/09/Destination-Unknown-AI-and-government.pdf>

- Chang, K.-Y., Ku, E. C. S. (2023). Discount or Prestige: E-reputation, Compatibility, and Continued Mobile Apps Usage Intention of Low-Cost Carriers. *Journal of Tourism and Services*, 14(26), 73-91. <https://doi.org/10.29036/jots.v14i26.463>
- Chilunjika, S. R., Uwizeyimana, D. E. (2024). Blockchain technology for health information management: a case of Zimbabwe. *Insights into Regional Development*, 6(1), 59-73. [https://doi.org/10.9770/IRD.2024.6.1\(5\)](https://doi.org/10.9770/IRD.2024.6.1(5))
- Cordella, A., Iannacci, F. (2010). Information systems in the public sector: The e-Government enactment framework. *The Journal of Strategic Information Systems*, 19(1), 52–66. <https://doi.org/10.1016/j.jsis.2010.01.001>
- Craglia, M., Annoni, A., Benczur, P., et al. Bertoldi, P., Delipetrev, P., De Prato, G., Feijoo, C., Fernandez-Macias, E., Gomez, E., et al (2018). Artificial Intelligence - A European perspective (M. Craglia (ed.)). Publications Office. <https://doi.org/10.2760/11251>
- Desouza, K. C., Dawson, G. S., and Chenok, D. (2020). Designing, developing, and deploying artificial intelligence systems: Lessons from and for the public sector. *Business Horizons*, 63(2), 205–213. <https://doi.org/10.1016/j.bushor.2019.11.004>
- Dvorsky, J., Petrakova, Z., Hudakova, M. and Bednarz, J. (2023). National support and legislative change in the business environment of V4 countries: Business sectors view. *Journal of Business Sectors*, 1 (1), 42-52. <https://doi.org/10.62222/EQDP3972>
- Eggers, W., Schatsky, D., Viechnicki, P., and Eggers, D. W. (2017). AI-augmented government: Using cognitive technologies to redesign public sector work. In Deloitte Center for Government Insights. https://www2.deloitte.com/content/dam/insights/us/articles/3832_AI-augmented-government/DUP_AI-augmented-government.pdf
- Engstrom, D. F., Ho, D. E., Sharkey, C. M., and Cuéllar, M.-F. (2020). Government by Algorithm: Artificial Intelligence in Federal Administrative Agencies. In SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.3551505>
- European Commission, Joint Research Centre (JRC) (2021). Selected AI cases in the public sector (JRC129301). European Commission, Joint Research Centre (JRC) [Dataset] PID: <http://data.europa.eu/89h/7342ea15-fd4f-4184-9603-98bd87d8239a>
- European Commission, Joint Research Centre, Misuraca, G., Noordt, C. (2021). *AI watch, artificial intelligence in public services – Overview of the use and impact of AI in public services in the EU*, Publications Office, <https://data.europa.eu/doi/10.2760/039619>
- Faulkner, N., Kaufman, S. (2018). Avoiding Theoretical Stagnation: A Systematic Review and Framework for Measuring Public Value. *Australian Journal of Public Administration*, 77(1), 69-86. <https://doi.org/10.1111/1467-8500.12251>
- Ginevičius, R. (2023). Evaluation of the economic development of European Union countries. *Journal of International Studies*, 16(4), 166-176. <https://doi.org/10.14254/2071-8330.2023/16-4/11>
- Hernandez Quiros, L., Tangi, L. and Schade, S. (2022). *Artificial intelligence in the public sector*, Publications Office of the European Union, Luxembourg. <https://doi.org/10.2760/35864>, JRC129199.
- Hinings, B., Gegenhuber, T., and Greenwood, R. (2018). Digital innovation and transformation: An institutional perspective. *Information and Organisation*, 28(1), 52-61.
- Katina, J., Plėta, T., Petkevičius, R., and Lelešienė, L. (2023). Industrial Control Systems (ICS) cyber prediction model. *Insights into Regional Development*, 5(1), 86-96. [https://doi.org/10.9770/IRD.2023.5.1\(6\)](https://doi.org/10.9770/IRD.2023.5.1(6))

- Khan, K.A., Akhtar, M. A., Vishwakarma, R. K., and Hoang, H. C. (2023). A sectoral perspective on the sustainable growth of SMEs. Empirical research in the V4 countries. *Journal of Business Sectors*, Number 1, Issue 1, pp. 10-21. <https://doi.org/10.62222/CVFW6962>
- Kmecová, I., Androniceanu, A. (2024). Level of investments in human capital in SMEs as a means of further development and increased competitiveness. *Journal of Competitiveness*, 16(1), 79-95. <https://doi.org/10.7441/joc.2024.01.05>
- Kő, A., Mitev, A., Kovács, T., Fehér, P. and Szabó, Z. (2022). Digital Agility, Digital Competitiveness, and Innovative Performance of SMEs. *Journal of Competitiveness*, 14(4), 78-96. <https://doi.org/10.7441/joc.2022.04.05>
- Kolkman, D. (2020). The usefulness of algorithmic models in policy making. *Government Information Quarterly*, 37(3), 101488. <https://doi.org/10.1016/j.giq.2020.101488>
- Kovács, A. M. (2022). Ransomware: a comprehensive study of the exponentially increasing cybersecurity threat. *Insights into Regional Development*, 4(2), 96-104. [https://doi.org/10.9770/IRD.2022.4.2\(8\)](https://doi.org/10.9770/IRD.2022.4.2(8))
- Krafft, P. M., Young, M., Katell, M., Huang, K., and Bugingo, G. (2019). Defining AI in Policy versus Practice. <http://arxiv.org/abs/1912.11095>
- Kowalska, A., Bieniek, M. (2022). Meeting the European green deal objective of expanding organic farming. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 17(3), 607-633. <https://doi.org/10.24136/eq.2022.021>
- Kronemann, B., Lal, B., Lucini, B., et al. (2019). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 101994. <https://doi.org/10.1016/j.ijinfomgt.2019.08.002>
- Lazaroiu, G., Androniceanu, A., Grecu, I., Grecu, G., and Negurita, O. (2022). Artificial intelligence-based decision-making algorithms, Internet of Things sensing networks, and sustainable cyber-physical management systems in big data-driven cognitive manufacturing. *Oeconomia Copernicana*, 13(4), 1047-1080. <https://doi.org/10.24136/oc.2022.030>
- Latzer, M., Just, N. (2020). Governance by and of Algorithms on the Internet: Impact and Consequences. In *Oxford Research Encyclopedia of Communication* (Issue February, pp. 1-21). Oxford University Press. <https://doi.org/10.1093/acrefore/9780190228613.013.904>
- Machova, R., Korcsmaros, E., Csereova, A., and Varga, J. (2023). Innovation activity of Slovak ICT SMEs. *Journal of Business Sectors*, 1 (1): 32-41. <https://doi.org/10.62222/HTPI2054>
- Montero, R. L., Parga, D. R. (2023). Constructing a special tax regime for developing sciences, technologies and innovation in Cuba. *Insights into Regional Development*, 5(3), 122-135. [https://doi.org/10.9770/IRD.2023.5.3\(7\)](https://doi.org/10.9770/IRD.2023.5.3(7))
- Paulikas, J., Paulikienė, B. (2022). Impact of the communicated information content on employee resistance to change. *Insights into Regional Development*, 4(3), 61-75. [https://doi.org/10.9770/IRD.2022.4.3\(4\)](https://doi.org/10.9770/IRD.2022.4.3(4))
- Peña, I., Andrade, S. M., Muñoz, R. M., and Martínez, I. (2023). A grouping of the Sustainable Development Goals (SDGs) and their influence on business results: An analysis for Spanish companies. *Oeconomia Copernicana*, 14(2), 551-583 <https://doi.org/10.24136/oc.2023.015>

- Piekut, M., Rybaltowicz, J. (2024). Comparative study of government expenditure on social protection in the Visegrád Group and Benelux. *Economics and Sociology*, 17(1), 280-294. doi:10.14254/2071-789X.2024/17-1/17
- Pouabe, P., Pretorius, J., Pretorius L., et al. (2023). Decision-making based on machine learning techniques: a case study. *Polish Journal of Management Studies*, 28(1), 240-262. <https://doi.org/10.17512/pjms.2023.28.1.14>.
- Shava, E., Vyas-Doorgapersad, S. (2023). Inclusive participation in information and communication technologies (ICTs) processes for smart services in the city of Johannesburg, *Insights into Regional Development* 5(1): 26-40. [https://doi.org/10.9770/IRD.2023.5.1\(2\)](https://doi.org/10.9770/IRD.2023.5.1(2))
- Sibiya, S., Vyas-Doorgapersad, S. (2023). Skills development for improved employee performance in South African municipalities. *Insights into Regional Development*, 5(4), 10-22. [https://doi.org/10.9770/IRD.2023.5.4\(1\)](https://doi.org/10.9770/IRD.2023.5.4(1))
- Tangi, L., Van Noordt, C., Combetto, M., et al. (2022). *European landscape on the use of Artificial Intelligence by the Public Sector*, Publications Office of the European Union, Luxembourg. <https://doi.org/10.2760/39336>.
- Tsheola, J., Sebola, M., and Mamabolo, M. (2023). South Africa's "Triple Crisis of Governance" and Societal Leadership Vacuum. *Insights into Regional Development*, 5(4), 23-35. [https://doi.org/10.9770/IRD.2023.5.4\(2\)](https://doi.org/10.9770/IRD.2023.5.4(2))
- Tung, L. T., My, D. T. H. (2023). Electronic Word of Mouth, Attitude, Motivation, and Travel Intention in the Post-COVID-19 Pandemic. *Journal of Tourism and Services*, 14(27), 181-196. <https://doi.org/10.29036/jots.v14i27.603>
- Zecca, E., Pronti, A., and Chioatto, E. (2023). Environmental policies, waste and circular convergence in the European context. *Insights into Regional Development*, 5(3), 95-121. [https://doi.org/10.9770/IRD.2023.5.3\(6\)](https://doi.org/10.9770/IRD.2023.5.3(6))
- Zhang, Z, Sun, Ch., Mikeska, M., and Vochozka, M. (2024). Does the competitive advantage of digital transformation influence comparability of accounting information? *Journal of Competitiveness*, 16(1), 115-130. <https://doi.org/10.7441/joc.2024.01.07>
- Zikhali, A., Lungwengwe, L., and Komisane, S. (2023). The role of value-based leadership on local economic development: a case study of Nyandeni Local Municipality, *Insights into Regional Development*, 5(3), 24-44. [https://doi.org/10.9770/IRD.2023.5.3\(2\)](https://doi.org/10.9770/IRD.2023.5.3(2))
- Zsigmond, T., Mura, L. (2023). Emotional intelligence and knowledge sharing as key factors in business management – evidence from Slovak SMEs. *Economics and Sociology*, 16(2), 248-264. <https://doi.org/10.14254/2071-789X.2023/16-2/15>
- Zsigmond, T., Mura, L., Machová, R., Bakó, F., and Kupi, M. (2024). Motivation and organisational culture from the perspective of SME employees – a case study at the time of COVID-19 pandemic. *International Journal of Services, Economics and Management*, 15(1), pp. 34-50. <https://doi.org/10.1504/IJSEM.2024.136058>