THE EUROPEAN UNION AND ARTIFICIAL INTELLIGENCE: STRATEGY, REGULATION, AND CHALLENGES

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Abstract:

The European Union (EU) has positioned itself as a global leader in the sustainable development of artificial intelligence (AI). With a focus on innovation, regulation, and societal impact, the EU aims to balance technological progress with fundamental rights and values. Such an objective translates into the European approach to excellence and trust through concrete rules and actions. This article explores the EU's strategic approach to AI, the Artificial Intelligence Act, investments, and the challenges it faces in a rapidly evolving global landscape with focus on digitalization in public administration. It contains general overview in digitalization in public sector, some challenges and benefits.

Key words: AI, Digitalization, Governance, Strategy, Regulations, Challenges

Introduction

The European Union has adopted a comprehensive approach to AI development, seeking to establish itself as a leader in trustworthy AI while fostering innovation and competitiveness. The European Union is at the forefront of shaping a digital future that is ethical, secure, and inclusive. As artificial intelligence (AI) becomes increasingly embedded in public administration, the EU is working to ensure that digitalisation enhances governance while upholding fundamental rights and democratic values. With the passage of landmark regulations like the AI Act, the EU is setting global standards for the responsible use of AI in the public sector. In recent years, artificial intelligence (AI) and digital technologies have become powerful tools for transforming public administration. Governments around the world are increasingly embracing these innovations to improve efficiency, transparency, and citizen engagement. The use of artificial intelligence (AI) in public administration is attracting increasing attention due to the potential benefits it can contribute to improving management functions and activities.

1. The EU's AI Strategy (and digitalization)

The EU's first coordinated strategy on AI, introduced in 2018, focuses on three key pillars:

1.1 Boosting Investments in AI

The EU aims to increase public and private investments in AI research and innovation. By 2027, the EU plans to mobilize €20 billion annually through initiatives like Horizon Europe and the Digital Europe Programme.

1.2. Ethical and Legal Frameworks

The EU emphasizes the need for AI systems to align with European values, including human rights, transparency, and accountability.

1. 3. Preparing for Socio-Economic Changes

Recognizing the disruptive potential of AI, the EU supports workforce upskilling and reskilling to ensure a smooth transition in labour markets.

In this regards the topic concerns digitalization in public administration operating became in the centre, especially in pillar 1. In an increasingly digital world, artificial intelligence (AI) and digitalization are reshaping the way governments operate and serve their citizens. The public sector, traditionally known for bureaucratic processes and slow adaptation to change, is now undergoing a significant transformation. As governments face growing expectations for transparency, efficiency, and personalized service, AI and digital tools are becoming indispensable.

2. The Role of AI and digitalization in Public Administration

Artificial intelligence offers numerous opportunities to improve public sector operations. One of the most visible uses of AI is in automated citizen services. Government agencies across the globe are deploying AI-powered chatbots and virtual assistants to help citizens find information, file complaints, or complete administrative tasks without the need for in-person visits or long wait times.

AI can also enhance internal government processes. Intelligent systems are capable of automating repetitive administrative tasks such as data entry, document classification, and scheduling. This reduces the workload on public employees and allows them to focus on higher-value tasks that require human judgment and empathy.

Moreover, AI has the potential to improve decision-making in the public sector. By analysing large datasets – such as traffic flows, healthcare records, or environmental data – AI systems can provide insights that support more informed and timely decisions. For example, predictive analytics can help anticipate the spread of diseases, identify at-risk populations, or optimize public transportation systems.

According to the latest analyses the digital transformation of public administration brings the opportunity to „improve interactions between governments and citizens through the simplification of procedures, as well as contributing to open government“[1]. This process generally includes automate administrative procedures (e.g., application processing, social service delivery), encourage decision-making through predictive analytics and risk assessments, as well as improve citizen engagement via AI-powered chatbots and multilingual platforms.

First, regarding the topic of automate administrative procedures „implementing AI in administrative procedures requires a comprehensive evaluation of the capabilities and limitations of different systems, including considerations of transparency and data availability. Data are a crucial factor in the operation of AI systems and validity of their predictions. It is essential to ensure that the data used to train AI algorithms are extensive, representative, and free of bias. Transparency is also an important aspect establishing trust and reliability in AI systems, particularly regarding the potential for transparent representation in rule-based approach“[2]. Although artificial intelligence is often presented or discussed as replacing or automating human activities, human resources and skills are invaluable to AI capabilities. AI does not develop without the participation of human experts and workers. Civil servants need to find new ways to work with AI systems, changing their traditional work groups and their attitudes to incorporate new technologies into work practices. Second, encourage decision-making through predictive analytics and risk assessments, as well as improve citizen engagement via AI-powered chatbots and multilingual platforms in public administration is attracting increasing attention due to the potential benefits it can contribute to improving citizens' satisfaction and government functions and activities. The application of artificial intelligence in these areas is actually considered by the majority of authors as future of public administration work.

AI is not just a tool for efficiency – it has become a pillar of digital sovereignty, enabling European governments to maintain control over their digital infrastructure and services (European Commission, 2020a)[3].

This means that the potential benefits of AI and Digitalization in Governance could be also in the mentioned areas. The efficiency is one of the main benefits, according to automate administrative procedures. Usually, automated systems streamline processes, reducing administrative costs and delays. Also, the transparency and accountability, other two principals, typical for public sector, reduce the chance of manipulation or corruption. Undisputed, the personalization

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[1] Digital transformation of public administration and services. https://knowledge4policy.ec.europa.eu/foresight/digital-transformation-public-administration-services_en

[2] Artificial Intelligence (AI) and Automation in Administrative Procedures: Potentials, Limitations, and Framework Conditions, (2023) Available from: https://www.researchgate.net/publication/371727727_Artificial_Intelligence_AI_and_Automation_in_Administrative_Procedures_Potentials_Limitations_and_Framework_Conditions [accessed Jul 28 2025].

[3] European Commission, 2020a *Shaping Europe's Digital Future*, https://digital-strategy.ec.europa.eu

of services is other key benefit especially for citizens, because can be tailored to individual needs, improving user satisfaction and inclusion. Last, but not least, data-driven policy making allows access to real-time data and helps governments respond quickly to crises and better plan for the future. This is also considering main benefit of using AI in public systems.

To ensure that all EU Member States can benefit equally from the opportunities of artificial intelligence in public administration, the European Union provides funding, infrastructure, and policy coordination mechanisms. The goal is to bridge digital divides, support innovation, and foster a unified digital space for public services via different digital programs for supporting digitalization, digital skills, training and interoperability across public administrations, such as Digital Europe Programme, as well as Interoperable Europe Act Initiatives, who encourage digital solutions and open-source platforms between countries, and many others. Those programs and norms are known as key regulatory instruments for encourage the digital transformation in EU.

However, there are still many challenges associated with the digital transformation in the different member states.

3. Challenges

Despite the benefits, the integration of AI and digital technologies in the public sector comes with challenges. One of the primary concerns is data privacy and security. Governments must protect sensitive citizen information from cyber threats and misuse. Strong data governance policies and secure IT infrastructure are essential.

Another critical issue is algorithmic bias. If AI systems are trained on biased or incomplete data, they may produce unfair outcomes, particularly in areas like law enforcement, social services, or hiring. This can reinforce inequality rather than reduce it.

There is also the risk of digital exclusion. Not all citizens have equal access to digital tools or the skills to use them effectively. Digital transformation must therefore be inclusive, ensuring that vulnerable and marginalized groups are not left behind.

Finally, public trust in AI systems must be nurtured. This requires transparency, explainability, and accountability in how decisions are made using AI. Governments should be open about the algorithms they use and provide channels for citizens to challenge automated decisions.

Another big question concerns the strategies and addressing employee – related challenges such as ethnical issues and future of the jobs. This include reskilling and training programs, inclusive implementation process, redefining roles rather than replacing them (Margetts, H., 2022), which would be topic in another research.

Also, many local and regional governments lack technical expertise to implement AI responsibly, in some cases there are fragmentation and trust deficit: Citizens may resist AI in sensitive domains (e.g. social welfare, immigration) without clear accountability mechanisms (EDPS, 2021).

For example, the application of AI is at different stage via different countries. Estonia has emerged as a leader in digital governance, with AI systems supporting its e-residency program and public service portals, but in Bulgaria the application is still limited to the online public service portal (e.g., document classification, digital ID verification). More precisely, since this system impacts access to public services, it is classified as high-risk under Annex III of the AI Act.

4. The EU AI Act: A Risk-Based Approach

In 2024, the EU formally adopted the AI Act, the world's first comprehensive legal framework for AI (European Parliament & Council, 2024)[4]. The regulation takes a risk-based approach:

Prohibited AI systems: Ban use cases deemed to pose unacceptable risks (e.g. social scoring by governments).

High-risk AI systems: Subject to strict requirements (e.g. for public sector uses like biometric identification, welfare eligibility, migration control).

Limited and minimal-risk systems: Require transparency obligations (e.g. chatbots must disclose they are AI).

The AI Act defines 4 levels of risk for AI systems[5]: unacceptable risk, high risk, limited risk (AI systems with specific transperansy obligations).

For public administrations, this means mandatory impact assessments before deploying high-risk AI (Article 27, Chapter III, , AI Act)"[6].

Public services fall under the high-risk category „High-risk AI systems used by public authorities must be registered and meet strict compliance standards." (AI Act, Annex III, Section 5)[7].

According to this classification AI systems bring certain barriers to the design, development, implementation, and use of artificial intelligence. The latest analysis shown that the concepts of using AI in public sector could be divided via at least three levels- micro, meso and macro levels.

At micro levels the using of new technologies refers to individuals. „These concepts concern the discretionary power of the public servant, standardization

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[4] Regulation (EU) 2024/1689 of the European Parliament and of the Council: https://eur-lex.europa.eu/eli/reg/2024/1689/oj/eng

[5] https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai

[6] AI Act, *Chapter III: High-Risk AI System*, https://artificialintelligenceact.eu/chapter/3/

[7] AI Act, *Chapter III: High-Risk AI System*, https://artificialintelligenceact.eu/section/3-5/

of decisions and results, erosion of the profession, loss or displacement of jobs which can be classified as opportunities and challenges for public administration"[8].

At meso level „the concepts related to decisions and interactions in organizations. These concepts concern accountability and performance which can be classified into opportunities and challenges for public administration"[9].

Determining risk under AI legislation primarily concerns the ***macro*** level. Macro level focuses on rules and norm. Normative framework for AI already exists at EU level, but it is still limited to general concept rather than concrete guidelines especially in the field of public sector were fall under the high-risk category. This means that normative framework needs to be extended and correctly implemented via different states. It is necessary to understand that the future of public administration depends on the new technology and the new norms and rules have to motivate public servants for more additional public values rather than exclusion. According to this understanding the future of AI seems to be more sustainable and competitive, especially if the EU manages to balance technological progress with fundamental rights and values. To address these, as well as to overcome the risks the EU is pushing for Common AI procurement guidelines, Ethics-by-design in public algorithms, stronger public sector AI literacy which could help countries to operate in more effective way.

5. The Future of AI in the Public Sector

The emergence of artificial intelligence is seen as a new and complex change in public sector operations. The promise of AI is to use intelligent machines to take over and facilitate human tasks and perform them more efficiently and effectively with tangible results and the creation of public value.

The transformation of technological capabilities into concrete public value for public administrations however is still limited. One of the factors hindering this progress is the lack of capabilities to use artificial intelligence (AI) in public administration work. Another factor is the lack of fundamental analysis that would show the real benefits and risks of implementing AI in the work of the administration, so as to achieve efficiency and effectiveness, and the ability to innovate in the public sector (Colin van Noordt &Luca Tangi, 2023).

To fully benefit from AI and digitalization, governments need to invest in digital infrastructure, workforce training, and ethical frameworks. Collaboration between public institutions, academia, the private sector, and civil society is key to building responsible AI systems.

The future of governance will be increasingly hybrid, combining human judgment with machine intelligence. Public officials will work alongside AI systems to deliver better, faster, and more citizen-centric services. Countries that embrace

[8] Geneviève., D., (2024),*Artificial Intelligence: Opportunities and Challenges for Public Administration.*, p. 390, 2024

[9] Ibid., p. 394

this shift and address its challenges responsibly will be better positioned to meet the demands of the 21st century.

Conclusion

The EU's approach to AI digitalisation in public administration is both ambitious and cautious. By combining innovation with regulation, the EU aims to foster trustworthy AI that enhances public services while protecting citizens' rights. The effective regulation should strike a careful balance: it must encourage innovation and allow public administrations to benefit from AI's potential while preventing misuse, discrimination, and erosion of public trust. As the AI Act is implemented across member states, it will shape not only how governments use AI, but also how they build a more inclusive, resilient, and digitally sovereign Europe. International cooperation, clear legal standards, and continuous monitoring are necessary to adapt regulations to the rapid pace of technological change. Moreover, the AI technology should allow public servants to be linked to the results of public policies even in new environment. This this requires responsible AI governance through transparent and adaptive regulation is vital for securing the public interest, safeguarding fundamental rights, both, to consumers and officers, and ensuring that AI serves as a tool for more effective, fair and inclusive public administration.

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