The new trends of digital transformation and artificial intelligence in public administration

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Abstract: Digital transformation and artificial intelligence are major challenges for a diversity of fields. The central and local administrations of the states need major and deep structural changes to reduce bureaucracy and public expenses, but also to significantly improve the quality of services, productivity, accessibility, and transparency of public institutions. Digitization and artificial intelligence are gradually integrated into state administrations and the governance process, and the results obtained confirm a visible increase in managerial, economic, and social efficiency. These aspects determine state governments to progressively design and implement strategies for digitalization and artificial intelligence within public services. Public investments needed for these changes are necessary for the sustainable development of the public sector. EU states are encouraged to make massive public investments to integrate artificial intelligence applications in public services and to operationalize digital transformations necessary for efficient and intelligent public administrations.

The implementation of digital transformation (DT) and artificial intelligence (AI) in public administration seems to be a real challenge with unexpectedly positive results in many European countries. New technologies such as collaborative artificial intelligence, sensory enhancement, augmented reality, and blockchains have the potential to provide opportunities for creative and sustained work in various fields, including public administration (Lazaroiu et al., 2022). For example, single-person accounts, single tax returns, e-invoices, government cloud, digital education, and e-public services are some of the newly implemented applications with the best results and satisfaction in many public administrations in Europe (Koman et al., 2022). Artificial intelligence can bring benefits not only in public administration but also in

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a wide range of public services, such as healthcare, energy consumption, automobiles, agriculture, climate change, and financial risk management Gavurova et al., 2022; Korol & Fotiadis, 2022; Kolkova & Rozehnal, 2022). But AI also brings new challenges for the future of jobs and raises legal and ethical issues.

Digital governance generically defines the use of new communication technologies and IT applications by central and local public administration, with the aim of streamlining the activity of the administrative apparatus and increasing the quality of public services. The reasons are also numerous and generally present in all European countries: the increasing bureaucracy that exists in the public system, the need to reduce access times to information and communication with public institutions through documents, increasing staff costs in funded institutions, reducing the costs of public procurement procedures and reduction of crimes in the public domain: fees and taxes, purchases and so on (Kuzmenko et al., 2023). Digital progress at the level of the EU countries in 2022 is reflected by DESI (Digital Economy and Society Index). Figure 1 contains a comparative frame for every component: human capital, connectivity, digital public services, and integration of digital technology.

Figure 1. Digital Economy and Society Index in the European States in 2022
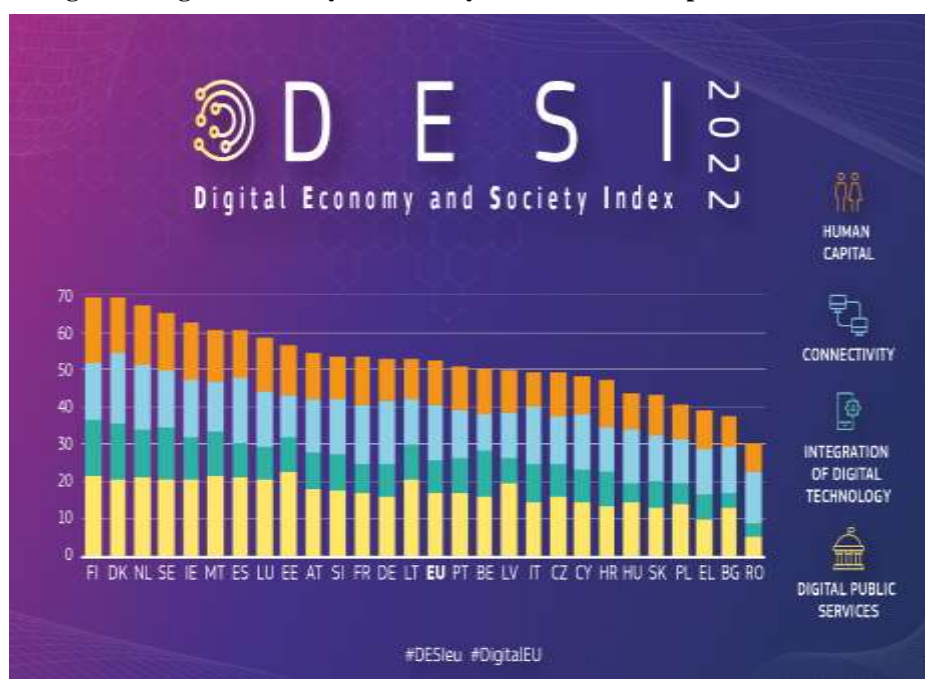
Source: Adaptation based on the EU Statistics

Applications based on artificial intelligence, however, also create risks for the people involved: both from an ethical point of view and even from a personal safety point

of view (Culasso et al., 2023). Thus, countries such as Germany, Finland, Denmark, and Great Britain repeatedly mention the importance of respecting the rights of individuals and the existing rules that regulate the protection of personal data, and information security requirements and support the trust of citizens. Several Member States have important parts of their strategies dedicated to the application of artificial intelligence (AI) in the public sector. Most mentions are found in the strategies of states such as Germany, Great Britain, Denmark, Spain, Finland or Lithuania. In the strategies of these states, actions to be followed, directions of action, and projects financed, realized, or in progress are defined.

Some European states have already achieved remarkable results and are continuing the digitization of public services and the integration of artificial intelligence in applications of interest to the administration, the economic sector, and citizens Małkowska et al., 2021; Głodowska et al., 2023; Hauke-Lopes et al., 2022; Katina et al., 2023). In 2022, the accessibility of public services through digitalization increased, as can be seen in Figure 2. DESI for digital public services reflects the progress as well.

Figure 2. Digital Public Services in the EU Countries in 2022

Source: Adaptation based on the EU statistics

Some interesting examples of good practices are presented below. In Germany, an AI-based solution has been developed for national defense. An example is the Next Generation Weapon System (NGWS) project launched jointly with France and Spain, which is interconnected with the air platforms of the Future Combat Air System

(FCAS). In terms of national and international technological developments in the armaments sector, AI serves to ensure the capabilities needed for national and allied defense in the future. AI technologies and AI applications with security relevance are incorporated into the AI Strategy.

Finland has an example of a successful pilot project in the Ministry of Finance. In the spring of 2018, the Financial Supervisory Authority (Fiva) launched a pilot project, in which the objective was to substantially reduce manual and routine work. As a result, the work of Fiva experts became more significant and most importantly, the robot and AI reduced the backlog of work. Robots can also perform tasks where humans make substantially more errors, meaning that the number of errors has decreased as well.

Denmark has a digital strategy that sets out the course of digitization efforts. According to international statistics, Denmark has one of the most digitalized public sectors in the world. It was possible because of a very well-developed digital infrastructure. According to the Danish government's goals, the public sector will be among the leading countries in Europe in using data and artificial intelligence to improve and target public services (Basuki et al. 2020),

The central government of Denmark will define standard processes for decision-making, procurement, implementation, and operation of AI applications in public administration (Craiut & Iancu, 2022; Duong et al., 2023; Gladden et al., 2022). Open-source solutions will also be increasingly considered in procurement. The central government itself can support start-ups and SMEs with AI solutions by paying more attention to them in public contracts, in accordance with the requirements of budget and public procurement legislation. The importance of AI in ensuring national security, including in police work, is recognized. AI offers the potential for security authorities to counter hybrid threats to preserve territorial integrity and protect the population. Recent applications in the field of health and social assistance that have integrated artificial intelligence confirm their estimated success and the confidence that the use of artificial intelligence is an effective direction for more efficient and quality public services in a wide variety of public sector fields.

Another European state where digital transformations and artificial intelligence have massively penetrated the public sector with great success is Lithuania. The approach to digital transformations and the integration of artificial intelligence applications started from changes in the organizational culture of public institutions, which was centered on innovation in the sphere of public services. A suitable government initiative consisted of the creation of a regulatory sandbox to monitor and test new artificial intelligence systems in the Lithuanian public administration for a certain period of time, before implementing them on a large scale (Zabala Aguayo & Ślusarczyk, 2020).

In order to implement the changes in the new public services, a Lithuanian artificial intelligence advisory committee was established to assist the government in decisions regarding future AI policy. Thus, a mechanism was created for public partnerships that create better conditions for the development of AI systems.

In France, there is a diversity of AI applications implemented within the Ministry of Economy and Finance. AI has significant potential in areas such as user assistance or even in the fight against fraud (Zhao et al., 2019). Therefore, the Ministry of Economy and Finance launched projects in this regard. For example, a "chatbot" was launched to provide easier access to human resources management regulations, the application is intended for managers in the ministries of culture and social affairs (Afonasova et al., 2019). Another "chatbot" was put into operation for users of the information system "Chorus", composed mainly of SMEs and micro-enterprises. A "deep surveillance" algorithm is used by French customs to detect fraud in value declarations. Also, an algorithm that analyzes natural language has been designed to detect cases of fraud or identity detection in traffic. New artificial intelligence modules have been developed within the anti-trafficking program within TRACFIN, the anti-money laundering and counter-terrorist financing unit.

Outside the European space, South Korea has developed numerous applications for the use of AI in the public sector, thus holding an international leadership position in digital governance and citizen participation (Szostak, 2022). However, in terms of government procurement of advanced technologies, it ranks only 32nd globally. This is about to change as more and more AI applications are used in tax and legal advice, social assistance, healthcare, crime prevention, as well as airport security, and forest firefighting. Military applications will be used to reduce the number of soldiers and improve decision-making processes.

In recent years, there have been major changes in the public administration in Romania. These demonstrate a clear determination in the central and local administration to accelerate the digital transformation, the implementation of solutions for electronic identity, the interoperability of digital solutions and artificial intelligence applications, the creation and operationalization of the government cloud, and others (Szeiner et al., 2022; Szeiner et al., 2020). The advantages of digital transformation in Romania, such as effectiveness, transparency, and simplicity, lead to much higher productivity of the processes required by public services. The awareness of the need for new technologies by the leaders of public institutions, the continuous concern for the adaptation of public services to the requirements of citizens and economic agents, and quality, safe, and fast online public services are just some of the changes implemented or in the process of being implemented (Korzynski et al., 2023; Staniulienė & Lavickaitė, 2022).

Interoperability is the basis of Romania's digital infrastructure and the foundation of European-level public administration (Khalatur et al., 2023). To adapt in this direction, on June 9, 2022, the Romanian Parliament adopted Law 242/2022 on the exchange of data between IT systems and the creation of the National Interoperability Platform (Sułkowski & Kaczorowska-Spychalska, 2021). The law regulates the adoption of measures related to technologies, equipment, software programs and the data used by them in order to contribute to increasing the degree of interconnection between the IT systems of authorities and public institutions and to facilitating the exchange of data between them, starting from the principles and objectives of the Framework European Interoperability (Kuzior et al., 2021; Marino

et al., 2022; Mura et al., 2021. Increasing the degree of interconnection of the IT systems of public institutions and authorities, facilitating the exchange of data between public institutions and simplifying administrative processes leads to increasing the effectiveness of administrative acts by implementing the "once only" principle. Identifying public sector data sets that can be made available to businesses, researchers, and public authorities and that can contribute to the development of artificial intelligence (Ślusarczyk et al., 2020). Applying AI in application areas such as tax and legal consulting, social assistance, healthcare, and crime prevention. Romania participates in projects within Cluster 4 Horizon Europe "Digital, industry and space" (Nowakowska-Grunt et al., 2021; Raišienė et al., 2021). Research centers and several public institutions are involved in partnerships in the research, development, and adoption of next-generation computing, data technologies, and infrastructures (Rymarczyk, 2020; Sabatini et al., 2022). Romania invests in cloud and state-of-the-art technologies and encourages cloud adoption through their National Recovery and Resilience Plans (NRRPs), including within the component for the RRF "Scale-up" pilot model. Several research directions are addressed in research centers and laboratories in Romania dedicated to AI (Shava & Vyas-Doorgapersad, 2023; Sieja & Wach, 2019) . These are Computer Vision and Image Processing; Data Mining; Medical data mining; Object detection, classification, and tracking; Speech Recognition; Bio-inspired computing; Decision support systems, - Expert systems - Fuzzy logic; Semantic Web; Bioinformatics; Computational Linguistics; Data Mining; Medical data mining; Natural Language; Processing Text Mining.The digital transformation and the integration of artificial intelligence by the central and local governments of Romania need consistent public investments to support the transformation of public administration and integration into the European administrative space. By 2030, EU Member States, in collaboration with the European Parliament, the EU Council and the Commission, will configure their digital policies to achieve targets in 4 areas, for (1) improving citizens' basic and advanced digital skills; (2)enhancing the adoption of new technologies such as artificial intelligence, data and cloud in EU businesses, including small businesses; (3) Further ensuring EU progress in connectivity, computing and data infrastructure; (4) Making services and public administration available online.

Conflict of Interest Statement

There is no conflict of interest.

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