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PREMISES AND IMPACTS OF IMPLEMENTING AI IN PUBLIC ADMINISTRATION

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Abstract
While the latest years were marked by a rapid development of the AI technologies and of the increasing attractivity of using them by people and also companies for solving more simply their issues, it has become obviously that also the interaction between them and the public authorities may be improved by using such technologies. Therefore, step by step AI technologies tend to become not only of interest for the Public Administration because of their benefits, but also a necessity in order to keep up with the transformation of the society. In this context, our paper proposes an analysis on the impacts that AI has already made during the latest years in the public administration area, but also on the expected impacts that are likely to occur in the next years, using data at global level, but mainly from the EU area. The analysis intends to find out the positive or negative impacts of AI, both from the point of view of the public administration, but especially from the point of view of the beneficiaries of public services and, finally, to forecast an image on the future of the public administration and society driven by the impact of AI technologies.
Keywords: *artificial intelligence; public administration; government*
JEL Classification: H89; O33.

1. INTRODUCTION

For several decades and, especially, during the present millennium, the world was marked by an extremely rapid development of the technologies, mainly in the information and communication area. That determined a similar rapid evolution from the information society to the so-called knowledge society and by the progressive development of this new society the new discovered technologies have accelerated this development of knowledge society, changing significantly also the way of life of the people.

The Internet has been for many years and still is maybe the most important technology that influenced the development of the society and every aspect of it,

by facilitating the access to information otherwise difficult to obtain. Internet has become the basic mean of development in all areas, such as economy, education, services etc. and impacted significantly on all economic and social processes especially by growing the speed and the number of these processes. It also brought alternatives for the people to fulfil more rapidly their needs, going from specific ones for goods and services to even special social ones related to interactions from the distance between people. However, the basic role of the Internet was to facilitate access to different things and the way that things were used by the people remained at their disposal and capabilities. This means that people's use of the information requires their efforts and may be subject of human errors. Therefore, it was obvious that the next expected progress of the society should bring better solutions for reducing both the efforts and the potential errors and this is how it emerged the idea of artificial intelligence that should replace the peoples' work and the peoples' reasoning.

Artificial intelligence (AI) is becoming nowadays increasingly important in peoples' life and in the society and facilitates solving more problems of the people most of them simple ones but also some complex ones. People get increasingly acquainted with AI and tend to use it in more situations, and this tendency determines a new shift in the society that must adapt to the demands of people for AI. This means that beside the citizens that have quite clearly expressed the interest in AI, all the other participants in the society, such as companies and governments need to adapt themselves to this new reality and to adjust their processes to these new demands.

This paper will approach the subject of the use of AI in public administration, concentrating first on the premises for implementing AI by the governments and going further in analysing the potential impacts of the AI in the relationships between government and the society.

2. LITERATURE REVIEW

In searching for solutions to simplify or more rapid solve different problems, humans have developed more complex technologies. In this context they developed specific tools for work, then computers and Internet for more rapid information and communication, going now towards robots to replace the human effort and finally towards artificial intelligence to replace even the human thinking.

Artificial intelligence is with no doubt the most complex innovation of the humanity and it opens almost unlimited possibilities for its use, especially when combining it with robotics or other advanced technologies. This new kind of technology needs to be developed and implemented however in accordance with the necessities of the society and having also in mind that beside the many benefits it can bring, there are also potential negative effects and threats that could be also brought.

Due to its complexity, also defining this concept has proved to be difficult and subject of several debates and interpretations. In this regard, maybe a very appropriate way of defining AI has been shaped by European Commission High Level Expert Group on AI which stated that "Artificial intelligence (AI) systems are software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal. AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behavior by analyzing how the environment is affected by their previous actions." (AI HLEG, 2021). Later the European Commission adopted the AI Act (European Commission, 2021) that sustained that "Artificial intelligence system' (AI system) means software that is developed with one or more of the techniques and approaches and can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with" (European Commission, 2021).

Another significant definition of AI comes from OECD which considers that "an AI system is a machine-based system that can, for a given set of human defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments. AI systems are designed to operate with varying levels of autonomy" (OECD, 2019). This definition however is the result of adapting the previous book on AI of Russel and Norvig (2010) according to which an AI system is a machine-based system that is capable of influencing the environment by making recommendations, predictions or decisions for a given set of objectives, by utilizing machine and/or human-based inputs to perceive real and/or virtual environments, abstract such perceptions into models manually or automatically and use model interpretations to formulate options for outcomes.

In time, several authors such as Minsky (1969), McCarthy (1989), Nilsson (2010), Poole and Mackworth (2017) or Kaplan and Haenlein (2018) have approached the subject of AI, trying to give comprehensive and also synthetized definitions of AI leading basically to the idea that AI mean machine-based systems capable of reasoning and even acting as a human person with extensive knowledge, usually faster and with less errors than the human.

Even if artificial intelligence has become now most interesting for the people it should be acknowledged that it hasn't emerge recently, but it was the result of a quite long and progressive process. According to Delipetrev *et al.* (2020), the interest for and the development of AI followed an ascending but sinuous trend starting from 1950s, with the establishment of the foundation of most of the AI algorithms and followed later by other important periods such as 1970s, with the paradigm shift in symbolic algorithms and building of expert

systems and later the development of machine learning in the 1990s, which led to the development of deep learning.

All the developments of the AI have attracted more and more attention to this technology and opened new possibilities of using such technology first by the companies and in the latest years by the general public which started to use it extensively and adopted it as part of their life. Therefore, on the background of an increasing demand of AI services, obviously also the offer of such services is expected to grow and while people use AI in more and more domains, also the offer of AI based services tend to cover these domains, as it can be noticed in Figure 1.

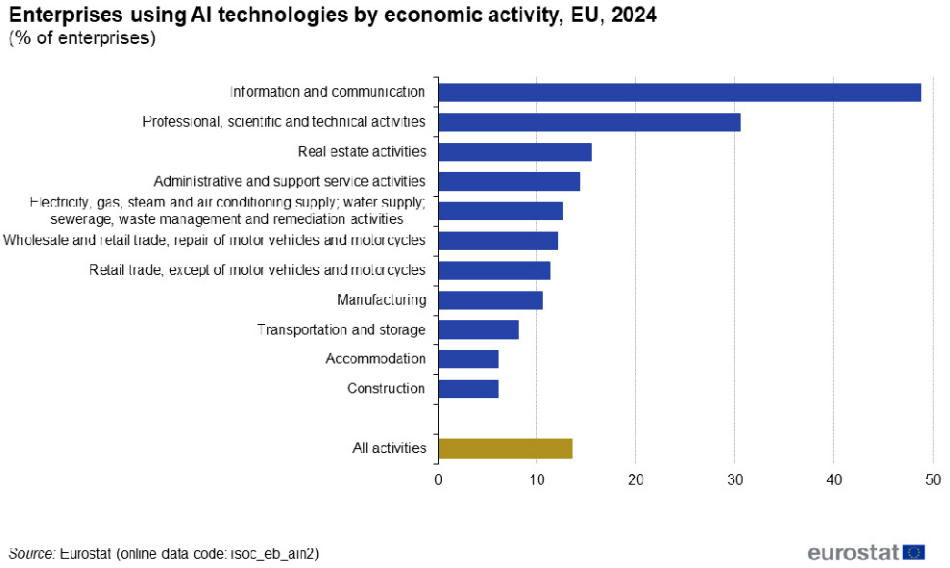


Figure 1. The use of AI in EU enterprises by activity in 2024

As Figure 1 shows the main use of AI remains that of Information and communication, followed by the professional, scientific and technical activities, Real estate activities and also administrative and support service activities etc. This image may be on the other hand interpreted as relevant not only for the enterprises themselves and for the specific business, but also as an image of the services demanded by the customers to be fulfilled by the enterprises and accepted to be received via AI use.

Looking from the perspective of any entity, either a company or a human person, each of them need to interact with other enterprises as suppliers of private goods and services but also need to interact with the public administration as supplier of public services and sometimes even public goods. Therefore, it is to be expected that also the second kind of interactions can be

improved by using AI within the government to citizens or government to businesses processes.

3. ANALYSIS OF IMPLEMENTING ARTIFICIAL INTELLIGENCE IN PUBLIC ADMINISTRATION

Implementing AI technologies in Public Administration can bring important advantages both in terms of improving the quality of the public services delivered and fastening the access to such services, but also in terms of optimizing the functioning of the public institutions by reducing significantly their costs and by more efficiently use of their human resources.

According to OECD (2024), AI technologies can run many complex tasks within the public administration, supporting internal operations, policy making, service delivery and internal and external oversight functions, having as impacts increased efficiency and effectiveness, responsiveness and accountability of the public administration (Table 1).

Table 1. AI impacts on public administration processes

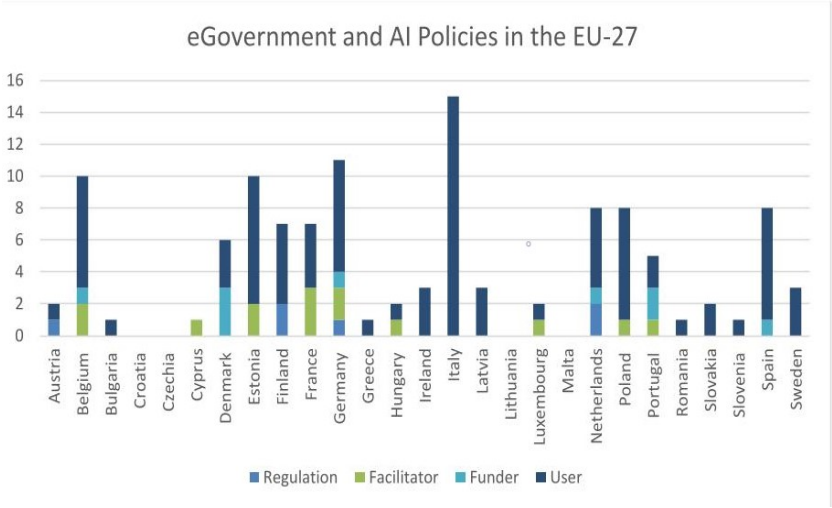
Tasks	Function	Impact
• Recognition. • Event detection. • Forecasting. • Personalisation. • Interaction support. • Goal-driven optimization. • Reasoning with knowledge structures. • Content generation	Internal operations	Productivity (efficiency and effectiveness)
	Policy making	
	Service delivery	Responsiveness
	Internal and external oversight	Accountability

Source: OECD (2024)

AI has an important potential on improving the internal operations or management in public organizations (Medaglia *et al.,* 2021). In this regard, van Noordt and Misuraca (2022) detailed this impact stressing that AI can improve the allocation of human resources and also the recruitment services, the financial management, the detection of fraud and corruption, the public procurement processes and increase the cybersecurity.

On the other hand, Valle-Cruz *et al.* (2020) have concluded that AI technologies can positively impact on the policy making processes, by making them more dynamic and data-driven. Moreover, Aoki (2020) shows that AI can have a significant impact on improving the public services delivery.

Due to the advantages of using AI technologies, governments all over the world, but especially of the developed countries tend to give more attention to implementing AI for delivering quality public services. In this regard, a relevant example is that of the countries of the European Union that have engaged in the latest years in developing specific policies meant to implement AI technologies in public administration, as it can be seen in the Figure 2:

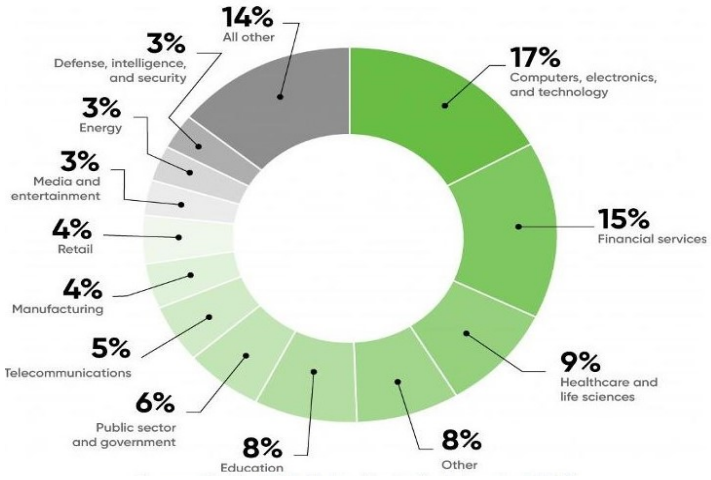


Source: European Commission (2024)

Figure 2. AI policies in EU27 in 2024

According to European Commission (2024), most of the EU27 countries have developed policies regarding the use of AI in public administration, but while some countries as Italy, Germany Belgium or Estonia have developed more such policies, other countries such as Croatia, Czechia, Lithuania or Malta, have still no such policies.

Many governments developed policies in which they play a role of facilitator, regulator and even funder for such technologies, that are supposed, from their perspective, not only to improve the public administration, but to play also a catalyst role also for other industries. That actions corroborated with the efforts of the private sector have led to the adoption of AI more or less in almost all the industries, as Figure 3 shows.

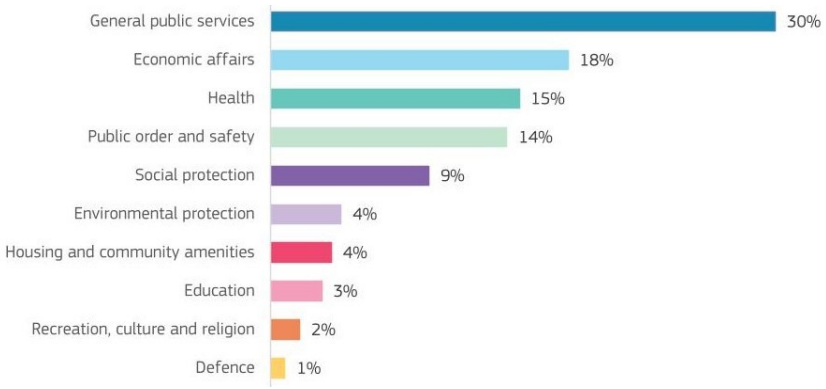


Source: European Commission (2024)

Figure 3. AI adoption in EU27 per industry by 2021

As Figure 3 shows, the interest and the engagement in implementing AI technologies is present in almost all economic and social areas, including in the public sector. Even the percentages of AI adoption are still low, it must be considered, especially in the case of the public sector, that the process of implementation has started only few years ago, and given the short period such percentages can be considered to be significant and sustain the idea that there are good premises for an extensive use of AI in next years.

At the same time, according to Tangi *et al.* (2022) the distribution of the use of AI on public services in EU27, is the following one (Figure 4):



Source: Tangi et al. (2022)

Figure 4. The distribution of the use of AI in EU27 by 2021

The distribution of the AI use in the public services shows almost a third of it is destinated to general public services, 18% for economic affairs and 15% for health services, but only 1% in defence and 3% in education services, even that at least in the case of the later the potential of AI use is very high.

There are several specific challenges that must be surpassed in order to increase the adoption of the AI in public administration. According to European Commission (2024) the major challenges in this regard can be categorized in procurement process challenges, data challenges, AI technology challenges and organisational capacity challenges.

McBride *et al.* (2021) analysed the procurement process challenges and sustain that the procurement process of AI technologies in the public sector is different than the other traditional procurement processes, which represents itself a challenge because public administration must adapt the procurement process by mitigating its own needs with the limited existing AI technologies. Moreover, as World Bank (2020) drew a similar conclusion and added the idea that there are needed new legislation, new policies and new strategies in order to clarify the role and the ethics of AI using.

The data challenges include the unclear data-ownership in the public sector, the issues regarding data sovereignty, the insufficiency of digital infrastructure and of high-quality data (McBride *et al.,* 2021).

The category of AI technology challenges were synthetized by the European Parliament (2021) as regarding firstly to possible discrimination due to data bias and hard coding of presumptions, secondly difficulties of ensuring the transparency and explicability (while the algorithms of AI systems are not public) and thirdly, the so-called dehumanization of the public services(while the AI systems solve the cases the same way regardless of the existence of some particular cases that should be treated differently).

Finally, the organisational capacity challenges consist in managerial, technical and human capital issues that exist both in public and private organizations. Beside the need of leaders skilled to conduct the AI implementation there is a need of leaders capable to communicate with all parties involved, including the beneficiaries of public services regarding the utility of AI technologies (Campion *et al.,* 2020). Also, in terms of technical issues there are possible functioning difficulties such as the lack of interoperability between an AI system and government applications, while the human capital issues are basically regarding the lack of digital skills (Kankanhalli *et al.,* 2019), both of the governmental employees, but also of the beneficiaries of public services.

Beyond these challenges that must be surpassed basically by the public administration, there are also other challenges that regard the beneficiaries of the public services, especially the citizens. In their case there also might appear issues regarding their capacity to use public services based on AI technologies

and moreover it is uncertain, even they have such capacity, how will they react to this new kind of services (Chatterjee *et al.,* 2021).

People and companies are already using some AI technologies to interact in private relations so they are acquainted to technologies such as chatbots, Therefore, we expect that such technologies will be used in the future on large scale also for the interactions between the public administration and citizens and companies. On the other hand, it will be more difficult to implement AI technologies to serve more complex tasks, especially regarding the optimization of the internal functioning of the public institutions, but, even more slowly, such technologies will be progressively implemented.

4. CONCLUSIONS

Using AI technologies becomes nowadays more and more a general phenomenon for people and companies and while such technologies advance rapidly and are increasingly used in the private processes, it is natural to expect an increased use of these technologies also in their relationships with public administration. Therefore, there is a specific need for the public administration to adapt itself to the needs and the demands of the society by implementing such technologies in delivering modern public services. Moreover, beside improving the interactions of the public administration with the beneficiaries of public services, AI technologies are able and expected to contribute to the optimization of the internal functioning of the public institutions.

The analysis performed, focused mainly on the case of the European Union countries revealed that all EU countries governments are engaging themselves in adopting AI technologies, but there are many discrepancies between them regarding the steps made toward this goal, some countries advancing more rapidly than others. Moreover, there are differences regarding the role of the governments in relation with AI, most of the governments focusing on the role of user, while others considering also the role of facilitator, regulator and funder for the use of AI not only in the public administration, but in all industries.

Implementing AI technologies in the public administration brings on the one hand many advantages for them, as stated before, but raises also many challenges for the public administration, such as procurement process challenges, data challenges, AI technology challenges and organisational capacity challenges, on the other hand. Moreover, the success of implementing AI, especially in the public services delivery processes, depends significantly on the willingness and the capacity of the beneficiaries to access such services.

However, looking how fast the use of AI in public administration grew in quite few years, we can consider that there are good premises for expecting a rapid growing of the use of AI in the public administration, both in the external and also in the internal processes developed by public institutions.

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