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The Challenges of Artificial Intelligence in Public Administration in the Framework of Smart Cities: Reflections and Legal Issues

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Abstract: In the last decade, artificial intelligence has generated several challenges in societies, with a special focus on public administration. Through the development of this literature review, we intend to underline the challenges that this has caused in the realm of public affairs, especially in terms of the smart cities framework, considering the legal perspective that is intrinsically associated with it. In this way, we based our research on a wide range of articles, from which we considered those with the greatest relevance and the highest number of citations in order to substantiate this theme in a more precise way. Finally, we present a set of conclusions, as well as opportunities for future investigations.

Keywords: smart city; public administration; administrative law; artificial intelligence

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1. Introduction

According to some data made available by the United Nations Department of Economic and Social Affairs (2022) on global population growth, it is expected to be exponential, reaching the barrier of 9.7 billion in 2050. This high increase will imply enormous challenges for both cities and public administration as a whole, not only due to the level of their growth but also the performance, competitiveness, and livelihoods of citizens (McKinsey & Company 2013). In fact, in Jacobsen's (2019) words, in an essay, the different public policies should consider how we are committing to guarantee a better future.

Thus, in this article, we intend, through a careful literature review (from which we considered the most recent works in the area in question, as well as works with a high number of citations), to make an objective approach to the challenges that artificial intelligence may generate at the level of public administration, more specifically, in the smart cities framework. Thus, and through the literature review that was carried out, we were able to draw a set of conclusions both in the area of administration and in the legal part that covers it.

In addition, this analysis also allowed us to outline some windows for future research of enormous relevance in the current panorama of public administration, always focusing on the challenges caused by these transformations.

1.1. The Current and Demanding Context in Which the Public Administration Operates

In the words of Johnston (2015), "Public administration is the term traditionally used to define the formal arrangements under which public organizations serve a government, ostensibly in the public interest" and "... is the term used to define the formal procedural and organizational arrangements under which public employees serve a government, by implementing and advising on policy and managing resources. Organizational aspects refer to both the overall structures as well as the relationships that occur within public administrations" (Johnston 2015). It is usual to consider that the framework in which public administration entities operate is increasingly demanding, implying a greater effort of

collaboration and cooperation between the different social actors, aiming at a more efficient and higher quality public service that meets the changing demands of the community. The centrality of the state is viewed with suspicion. On the other side of the coin, as a response to the adversities of centralization, we find fragmentation and decentralization of the state; however, they are multidimensional and complex phenomena (Pereira and Correia 2022).

At the same time, public managers are forced to manage organizations that operate in an environment of great competition and dispute over scarce resources, where it is crucial to align their performance while maintaining the focus on their contribution to the development of society, with a special focus on the needs of the community. Thus, it must endeavor to keep up with this evolutionary dynamism, positioning local entities (local authorities) as agents with special skills to achieve this goal.

Public administration is often confronted with a set of limitations of different natures, such as financial, organizational, and political, that, on the one hand, prevent normal and regular action in its most different and heterogeneous missions and, on the other hand, motivate it—if not even oblige—to act to accompany and be able to respond to the demands of the community that needs it. Along with this need for action, we have the occurrence of the transformation that has developed in terms of the role and functions of the state over the last few decades, which has also been synonymous with changes in governance models (Correia et al. 2019a).

The public sector has some inherent characteristics, such as the existence of a political dimension, the scarcity of economic incentives, accountability to elected representatives, diverse and divergent objectives and priorities, absence or rarity of competition in organizations, and service supply/price ratio, among others, which constitute barriers to its performance. Notwithstanding the existence of such constraints, there are also positive dimensions that must be matured and properly planned in the management of any public policy cycle, such as the existence of a large budget, an increasing academic level of its staff, easy access to Big Data, related to citizens and the existence of relatively favorable conditions in terms of intra-organizational learning, as well as the ability to adjust to political changes and the diffusion of innovation (Rashman and Hartley 2002).

Service delivery with a focus on citizen needs takes place in a fragmented environment, which includes several stakeholders with different interests and missions (Haveri 2006) that must act in concert. Thus, keeping the focus on administrative processes or intra-organizational management carries risks (Osborne et al. 2013); i.e., organizations cannot aspire to persist over time if they remain self-focused. Instead, the motivation should be to promote platforms that integrate the contributions of different actors, fostering a broader paradigm that enhances both the management of inter-organizational relationships and the effectiveness of public service delivery systems (Osborne et al. 2013).

It is, therefore, crucial that there is a strategic and cohesive cooperation between the moment of defining public policies at the central level and their consequent application in the territory so that it can meet the needs of the communities. Many of the problems faced by these territories are related to a pattern of productive specialization based on activities with low added value and low technological intensity, strong segmentation of the labor market, precarious employment, structural unemployment, poverty, social exclusion, significant rates of early school leaving, inefficient use and management of resources with regard to soil and natural resources, and vulnerabilities to natural risks and climate changes (Correia and Lopo 2017).

When talking about intergovernmental cooperation—from a collaborative governance perspective—it is understood that many elements involve the structure developed for the object in question, and there are many factors that induce each of the autonomous public entities to give up a portion of their autonomy with a view to a single objective of a group of other autonomous entities (Correia et al. 2019b).

According to Ansell and Gash (2008), collaborative governance can be defined as "A governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and

deliberative and that aims to make or implement public policy or manage public programs or assets" (Ansell and Gash 2008, pp. 544–45). From the definition presented by these authors, six fundamental criteria that support collaborative governance stand out, namely: (a) the collaborative arrangement is initiated by public institutions or agencies; (b) participants include non-state actors; (c) participants are directly involved in the decision-making process, and they are not merely consulted by public agencies; (d) collaborative arrangement is formally organized and meets collectively; (e) the collaborative arrangement seeks to make decisions by consensus; (f) the focus of collaboration is on public management or public policies (Mendes et al. 2023).

It is from the recognition of the existence of this environment that the creation of conditions that allow for the development of collaborative platforms can be considered using two perspectives: firstly, the contributors to the positive results for society associated with collaboration can be evaluated, and, on the other hand, it is urgent to evaluate and anticipate the impact of possible barriers to the constitution of local-based collaborative arrangements, so that their effects can be minimized.

The following section will analyze the role that smart cities have been playing as value-generating practices for the creation, implementation, and development of sustainable territorial management policies.

1.2. The Need for Sustainable Land Management

As cities grow in number and population, they gain more economic, political, and technological power and increasingly take center stage globally. From an economic perspective, cities are becoming the centers of a globally integrated system and a service-based society. From a political perspective, they are at the center of a realignment of power, with greater influence but also greater responsibility. From a technological perspective, ongoing advances can provide them with a better understanding and control of their operations and development (Dirks and Keeling 2009).

The role that humans have played in the excessive use of the planet's natural resources has had serious consequences in terms of the ecological footprint (Moreno Pires et al. 2020). In recent years, there has been an evolution of environmental issues toward a broader sustainability approach, with environmental sustainability as the main focus, and establishing the adoption of more holistic approaches as fundamental in order to achieve the proclaimed paradigm shift (Disterheft et al. 2015).

In this way, the integration of sustainable development has progressively gained more relevance at the level of education, as Higher Education Institutions are increasingly assuming social and environmental responsibilities, playing the roles of agents in promoting sustainable principles (Stough et al. 2018).

Thus, this continuous increase in the size of cities and the number of inhabitants living in them will lead to dangerous environmental impacts, leading to a constant need to place sustainability and the environment as central themes in the ongoing search for sustainable globalization (Haughton and Hunter 2003).

1.3. The Importance of Information and Communication Technologies in Territorial Management from the Perspective of Smart Cities

Following the words of Bilhim (2004) closely, "the new electronic forms of information management represent an opportunity to increase political participation and horizontal communication between citizens", it seems appropriate to make a brief reference to the importance of Information and Communication Technologies (ICT) for the creation of smart cities since they stand out as a fundamental element for the construction of this concept. In fact, modernization and quality in public administration have always been a feature of all governance models (Quintas et al. 2023).

The number of initiatives has been increasing, and this may also be due to the unstoppable diffusion and integration of new technologies, especially information and communication. This increase has been widely exploited due to the diffusion of mobile devices,

which allow for a more active participation of citizens (Kirwan 2015). However, the role of ICT does not only represent the provision of technological solutions in connectivity initiatives that require data processing. Citizen participation is considered the key element in smart cities, and the possibility of giving voice to the citizen is even one of its most prominent objectives, giving him decision-making power (Pla-Castells et al. 2015).

2. Materials and Methods

This research article was conceived through a qualitative analysis, in which we resorted to the analysis of several bibliographic sources in order to, at first, identify the main dimensions of a smart city and select those that were defined by Giffinger et al. (2007) and then, to make as precise an approach as possible about the introduction and transformations that artificial intelligence can bring to public administration, more specifically, in terms of its implementation in smart cities. Thus, after identifying the dimensions, we will move on to a brief comparative analysis between two case studies of smart city projects on a global scale—Singapore and Amsterdam—concluding later with this approach on the role that administrative law plays in smart cities, as well as the implementation of artificial intelligence systems (hereinafter, AI) in this urban model in order to realize the relevance that these two criteria can play in the construction of a smart city project.

2.1. Smart Cities and Their Dimensions

Some authors have developed a proposal for operationalizing this concept. Their aim was to prevent and avoid the risk of incorrect designations. Thus, there are six distinct dimensions that form the pillars for measuring the degree of intelligence of a city; they are Smart People, Smart Economy, Smart Governance, Smart Environment, Smart Mobility, and Smart Living (Mendes et al. 2021).

Therefore, starting with the Smart People dimension, it measures, through some parameters, the population's education levels, employability levels, among other relevant data; Smart Economy assesses a city economically—more specifically, its degree of competitiveness—and reflects how well prepared it is, through the use of some parameters, such as the number of companies based as well as their quality or their tendency toward entrepreneurship; Smart Governance is directly related to public participation, more specifically, to participatory governments and also to the functioning of the administration in terms of the service provided to citizens, because it is essential that there is adequate management in order to avoid the risks arising from the lack of resources and capacities on the part of local governments (Oliveira et al. 2023); Smart Environment is determined by the management of natural resources and environmental protection, always ensuring good management of urban waste and the preservation and creation of green spaces; Smart Mobility concerns the local and international accessibility of cities and the respective network of communication and information technologies; finally, Smart Living encompasses, as the name implies, issues related to quality of life, such as health, inclusion, safety, culture, among other aspects that concern our daily lives (Selada and Silva 2020).

Thus, these pillars of a smart city materialize in smart urban solutions, which can be seen in an integrated way, spread across the most diverse areas, such as energy, mobility, waste and water management, and governance, among many others (Selada and Silva 2020). Some practical applications of these smart urban solutions in terms of mobility include, for example, smart parking management, real-time traffic control systems (smart traffic), and the promotion of public transport. On the environmental side, there are also numerous examples of practical measures that can be implemented and that would undoubtedly have very positive consequences. We refer to the use of equipment for remote monitoring of energy consumption, the application of load limitation sensors in waste containers, ecopoints, and smart public lighting (ibid. 2020).

For the other dimensions, there is also a diversity of solutions to respond to the various challenges society and the world in general face, both in terms of governance and people, without ever forgetting the aspects of the economy and smart living. Above all, and it is

important to emphasize, a smart government must be endowed with a long-term vision since plans must be designed with the future in mind in order to be able to correctly guide public policies. Moreover, this long-term vision must always be combined with a solid knowledge base, in that a careful diagnosis of the situation in which the city finds itself must be made so that its future development potential can be more closely understood (Fernandes 2016).

2.2. Smart City vs. Ecocity

In addition to the concept of a smart city, other concepts in this area have been emerging. Currently, there is a distinction that we cannot fail to present, given the relevance it has gained: smart city vs. ecocity. Previously, we presented the concept of a smart city, as well as its respective definitions, but the concept of ecocity differs somewhat from the previous concept.

There is still no universally accepted definition for this concept in the scientific community. Thus, the one we have chosen and will use as a base definition was developed by Ecocity Builders and the International Ecocity Framework and Standards (IEFS) advisory team on 20 February 2010 in Vancouver, BC, Canada. According to this perspective, ecocity is a human settlement modeled on the self-sustaining and resilient structure and function of natural ecosystems. An ecocity provides healthy abundance for its inhabitants without consuming more (renewable) resources than it produces, without producing more waste than it can assimilate, and without being toxic to itself or to neighboring ecosystems (Singh and Tiwari 2016). Moreover, its social order reflects fundamental principles of equity, justice, and parity (Leźnicki and Lewandowska 2014).

We will now present a real example of an ecocity: the city of Masdar. Based in the desert next to the capital of the United Arab Emirates, Abu Dhabi, it started to be designed and developed in 2006 and is seen as one of the first sustainable, smart, and carbon footprint-free projects in the Middle East. It unites renewable energy sources with the efficient use of resources (Lau 2012) and has even been designated as a living lab for sustainable urban technologies (Cugurullo 2013).

Masdar was designed to consider the highest possible level of sustainability for the vast majority of aspects of life. It was meticulously designed by the Abu Dhabi power company to conserve energy through solar panels and geothermal plants. One of the goals is to reduce waste with its unique and highly innovative recycling system. On the other hand, another focus is to restrict water consumption by using desalination machines, drastically reducing carbon emissions through elaborate transport plans (World Commission on Development and the Environment 1987). Although few buildings have yet been completed, project officials claim that the largest solar photovoltaic plant in the Middle East is in operation there (Lau 2012).

Indeed, we can observe that the concepts of smart and ecocities have some points of convergence, but at their core, they end up being distinct concepts since an ecocity is based on a 100% sustainable society, and its main focus is the environmental challenges that have been increasing, requiring more immediate and more "radical" responses. A smart city, on the other hand, as mentioned above, has more than one main focus and is subdivided into the six dimensions presented.

Nowadays, global examples of smart cities have been multiplying, with more and more cities implementing smart strategies. Thus, we should look at the "Smart City Ranking 2023", developed by the Institute for Management Development in collaboration with the Singapore University of Technology and Design (2023), composed of 140 cities from all parts of the globe (Table 1).

Table 1. Smart City Ranking 2023.

Position	City
1	Zurich
2	Oslo
3	Canberra
4	Copenhagen
5	Lausanne
6	London
7	Singapore
8	Helsinki
9	Geneva
10	Stockholm
11	Hamburg
12	Beijing
13	Abu Dhabi
14	Prague
15	Amsterdam

Source: own authorship, based on International Institute for Management Development (2023).

It should be noted that this ranking is based on five key areas: safety and health; mobility; opportunity; activities; and governance.

In addition to the ranking, the Institute for Management Development also carried out an in-depth analysis of each of these 140 cities by measuring each of these indicators as well as a set of baseline incentives.

As we can see in the table above, eight of the ten cities that make up the top 10 smart cities ranking are in Europe. Compared with the last ranking (2021), we can see that representation from Asia reduced from two to one city (Taipei is not listed in the current ranking), and Oceania switched its representation from Auckland to Canberra. Another relevant aspect from which we can draw conclusions is that the city of Amsterdam (known as the first smart city) is currently in the 15th position, having moved from the 17th position in the 2021 ranking.

We will, therefore, analyze two cities more closely: Singapore and Amsterdam.

2.2.1. The Study Case of Singapore

For the past three years, Singapore has been one of the benchmark cities in this ranking. When the IMD Smart City Ranking was published in 2021, the city of Singapore occupied the 1st position. However, with the publication of this ranking, the 2021 position was changed from the 1st position to the 7th position (the same as the current ranking of 2023). Rankings prior to 2023 have been adjusted according to the new methodology for the purposes of homogeneity and to allow comparison. In 2023, the SCI comprised the 15 cities from the table above (International Institute for Management Development 2023).

This smartization project is under the umbrella of Smart Nation Singapore and is called the Smart Nation Platform (SNP). The main aspect in which the city excels is in the use of innovative state-of-the-art technologies, as well as in solving structural problems using disruptive paradigms (Shamsuzzoha et al. 2021). Going back a bit in history, we find that the first national technology plan was drawn up in 1980. Since then, six plans have been implemented, with the aim of making Singapore the first "smart island". As early as 2015, Smart Nation Singapore emerged with the clear goal of becoming the world's first smart nation (Foo and Pan 2016).

For Singapore, the notion of a smart nation is based on its ability to collect data, interpret it, gather knowledge, and channel it into meaningful action. This initiative is built on the following three key areas: connecting; collecting; and understanding (ibid. 2016).

There are three reasons why Singapore has focused on these three areas: firstly, the elderly population is expected to reach 900,000 by 2030, which creates a strong and urgent need for adequate infrastructure in housing, hospitals, and workplaces to meet the needs

of the elderly. Secondly, like any cosmopolitan city, sustainable urban mobility solutions are needed to address existing congestion problems. Last but not least, accessibility to data would greatly help in the decision-making process, allowing for better-informed decisions (Balakrishnan 2015).

A key aspect of SNP is the development of better awareness through the collection and sharing of real-time data. An important step toward realizing this occurred in 2014 when the Singapore government installed around 1000 sensors across the island to track data on everything from air quality and water levels to public safety. These data are then sent to government agencies, which analyze them in detail (Foo and Pan 2016).

2.2.2. The Study Case of Amsterdam

Although the city of Amsterdam only appears in the 15th place in the Smart City Ranking 2023, we could not fail to mention it, as it is considered the 1st existing smart city project.

Supported by the belief that ICT contributed to the improvement of the functioning of cities (Baron 2012), three organizations emerged and together initiated the currently ongoing Amsterdam Smart City (ASC) Programme: the Amsterdam Innovation Motor; Liander; and the Amsterdam city administration (Mora and Bolici 2017). The ASC was established in 2009 to increase collaboration between citizens and organizations in finding solutions to solve the city's environmental problems—such as reducing CO_2 emissions (van Winden et al. 2016). Both government and non-governmental organizations can initiate a project to address specific urban environmental problems. However, the ASC focuses its efforts mainly on energy and mobility issues (ibid. 2016). Each project has its own indicators for specific phases, such as development, implementation, and evaluation (Putra and van der Knaap 2018).

In ASC, the operationalization of a smart city focuses on the creation of small local projects via the use and creation of innovative technology, creating changes in behaviors, and using sustainable economic investment. Furthermore, in ASC, all projects developed are the result of collaboration between citizens, communities, and associated companies (Putra and van der Knaap 2018). Thus, the ASC is also an example of how a city can recognize and incite participation to educate and unite city actors (Kusumastuti 2017). Nowadays, this is supported by the development of ICTs, so information exchange can be realized through digital technologies—e.g., websites and apps (Putra and van der Knaap 2018).

In the view of Iizuka (2013), innovation systems have changed their focus from being firm-centered to being community-centered. This means that innovation systems are now used not only to improve the performance of firms but also to improve the quality of life of communities. An innovation system that emerges in an urban area is typified as an "urban innovation system" (Putra and van der Knaap 2018).

This project is supported by four pillars. These are the following: firstly, a collective approach, i.e., each project implemented under ASC is based on cooperation between all relevant parties to achieve feasible results; secondly, innovation and awareness—the project should not only be based on innovative technology but also needs to incite behavioral changes; thirdly, knowledge dissemination, which refers to the exchange of knowledge between stakeholders through the sharing of experiences made on the ASC platform; and lastly, the project must be economically viable to have a higher chance of progression. In fact, ASC does not only aim to implement projects in Amsterdam, but also to replicate them in other cities (Putra and van der Knaap 2018).

3. Smart Cities, Artificial Intelligence, and Administrative Law

3.1. The Role of Administrative Law

There has been growing research into areas where artificial intelligence and innovation could provide added value in increasing the quality of the public service provided. The topic of artificial intelligence in the context of public policy has been worked on in the international context and, in particular, in Portugal (Correia and Garcia 2023). As an

example, we have the study of Pereira et al. (2023) where a mapping of studies was carried out on innovation and digital transformation in the justice sector. The internal norms of the digital community serve as a parameter for the decisions taken by companies regarding the regulation of speech or, in the mildest words used by them, the moderation of content inserted on the platform by users (Freitas et al. 2023). The internet and the various digital contact methods that have sprung up over the past 20 years are becoming more and more important for social interactions and human connection. However, this could mean facilitating communication and democratizing access to goods and services was, at the same time, a precursor to serious damage in terms of self-determination and access to knowledge and information. (Freitas et al. 2023).

When it comes to analyzing smart cities, the use of artificial intelligence (AI) and its impact on public decision-making should be discussed. Thus, smart cities invite administrative law to act in scenarios that were little explored or even non-existent before this new reality.

Although the proper understanding of the use of AI in the implementation of smart cities in Portugal imposes interdisciplinarity, the following lines only question the role of administrative law in regulating the impacts that AI may cause from the outset in the implementation of smart cities.

It will tend to be a phenomenon that requires multi-level legal treatment, i.e., at least at the national, European (with the European Union in the running—(Cantero Gamito and Ebers 2021; Cabral 2021)), and international levels. Furthermore, it is important to emphasize that AI applications must not only conform to legal principles in their design but also in the outcomes they produce. This means that they must adhere to a core legal standard, specifically, the principle of equal treatment, while also respecting other fundamental rights.

In addition to upholding a sufficient level of the rule of law that AI projects and systems must not undermine and should, in fact, enhance, each individual project and system will introduce its unique legal challenges. These may include issues already identified, such as the legal responsibility of autonomous entities, as well as those stemming from the utilization of AI for routine legal tasks (Pedro 2023).

Although AI has invaded the "legal city", the truth is that the legal city tends to be slower than technology. This slowness, which may even be healthy, does require institutional preparation with adequate technical knowledge for the understanding, development, and application of the different public policies referred to; otherwise, it will rest on the knowledge and services provided by private companies whose scope by nature does not tend to coincide with the protection, primarily, of the public interest.

Legislative and administrative regulations, even if they are carefully crafted to protect innovation, must prioritize the preservation of essential values, with a primary focus on ensuring equal treatment. It is important to note that there is a shared concern that AI tends to exacerbate inequality. This inequality is not only immediate, as seen in cases of biased treatment in contexts like law enforcement and AI-assisted job interviews or offers, but also indirect. Despite some efforts to promote education in computer science and programming, the reality is that only a small portion of individuals will truly master AI techniques. This trend is leading toward a future where AI-driven businesses are dominated by wealthier classes (Pedro 2023).

Nevertheless, it is worth mentioning that if the anticipated progress and development of AI come to fruition, future inequality may result from only a select few reaping the benefits of AI's positive impacts, while the risks are borne by society as a whole.

Finally, it should be borne in mind that the main administrative rules in force and which should apply to initiatives such as smart cities were not designed to be applied to this scenario, which may generate some imbalances, which may require a regulatory framework to ensure respect for the principles, values, and rights enshrined in our legal system. Regardless of the approval of a possible new regulatory framework, it should be

made clear that the admission of smart cities requires the fulfillment of a set of administrative guarantees.

3.2. Some Guarantee Requirements of Administrative Law

In general, the legal system, while solidifying public policy choices, cannot ignore the social and economic transformations that AI is poised to bring. It should actively function as an equalizer and protector of various aspects of human dignity as these changes unfold. The concept of implementing smart cities should not disregard the protection afforded by administrative law.

Considering the significant impact of public activities on the lives of citizens, it becomes clear that administrative law must take into account the influence of AI systems in these activities. In other words, as public tasks increasingly involve AI systems or benefit from their support, administrative law should establish regulations right from the start. These regulations should cover the approval of such systems and their operational guidelines in alignment with the legal and administrative safeguards that are standard in administrative activities (Pedro 2023).

There is no justification for diminishing the procedural safeguards of individuals with legitimate rights and interests when it comes to administrative decisions that may impact their legal status. Promoting innovation should not come at the expense of citizens' rights. The principles of the rule of law, access to the courts, and respect for fundamental rights, along with key principles like transparency, impartiality, and fairness, all underscore this point. In essence, public activities carried out by AI systems must not operate outside the bounds of the law (Carrero and Ribeiro 2019).

Administrative activities involving AI systems must adhere to a set of guarantees rooted in the principles of good administration and general administrative procedures. These activities should also be equipped with legal mechanisms that ensure that affected individuals have access to appropriate administrative and judicial safeguards. There should be no areas of immunity in the realm of smart local administrative activities (Pedro 2023).

Furthermore, the need to strengthen these safeguards might arise depending on the type of AI system in use, especially in cases involving automated administrative decisions driven by algorithms, often referred to as "Public Administration 4.0." (Griffi 2018).

3.3. Smart Local Government: Transparency and Rationale

The decision to integrate AI systems into public activities, whether undertaken by public entities or individuals performing public roles, particularly in the development and operation of smart cities, compels administrative law to navigate uncertain terrain. This uncertainty arises not only from the inherent traits of AI, such as opacity, complexity, data dependence, and autonomous behavior, but also because the utilization of AI systems by public authorities is still evolving (AMA 2022). Furthermore, it is noteworthy that the concept of smart cities is relatively new and evolving.

Despite the challenges presented by these complexities, it is imperative that administrative activities conducted through AI systems adhere to fundamental principles of administrative law, notably, the principle of good administration. In essence, the governance and legality of AI systems and algorithms must be addressed (Appel and Coglianese 2020), even in the absence of a specific regulatory framework.

Therefore, the decision to employ an AI system within the realm of public administration should be subject to public scrutiny. In other words, before utilizing an AI system for administrative purposes, it must undergo a process of public approval (Valero-Torrijos 2019), possibly through a formal "public act" that includes an appropriate administrative procedure, especially when algorithms are in play. This approach is essential for evaluating the potential risks associated with AI systems and their appropriateness. It allows for the application of the three tests mandated by the principle of proportionality when assessing the manner and risks involved in administrative activities. Furthermore, this public

scrutiny should extend to the ongoing monitoring of AI systems throughout their lifecycle (Pedro 2023).

The specific traits of certain AI systems, especially those driven by algorithms, which include opacity and the inability to explain their decisions, underscore the importance of the principle of good administration in enhancing the transparency and reasoning aspects of administrative decisions (Appel and Coglianese 2020; Gil Cruz 2021).

In the context of guaranteeing transparency, it is crucial to acknowledge a safeguard that encompasses not only the outcome of the application but, most importantly, the source of the data used and the processing procedures employed (Valero-Torrijos 2019).

The necessity for prioritizing transparency also stems from the fact that a significant portion of AI systems used by the public administration may be developed by private entities. This prevents the public administration from being locked into or guided solely by the standards set by these private entities. As a general rule, the public administration should be obligated to proactively disclose the fundamental principles underpinning the algorithms. This, in turn, assumes that the AI systems in question are transparent, meaning that they enable the explanation, examination, and replication of decisions and data usage within those systems. In essence, the "glass house" concept (Gonçalves 2019), which should characterize public administration, does not align well with the presence of "black boxes" (Wischmeyer 2020), referring to the opaque processes or implicit reasoning of AI systems.

In summary, when it comes to establishing and running smart cities, a clear and unwavering commitment to transparency is essential. Additionally, the unique demand of the principle of good administration entails that administrative actions backed by AI systems must be thoroughly justified, considering the specific characteristics of the administrative decisions in which these systems are employed. Most importantly, these decisions should be comprehensible to individuals without specialized knowledge to assess the technology's implications (Valero-Torrijos 2019).

4. Discussion

One of the main concerns that arises when it comes to the transparency of AI systems in administrative activity (Orofino 2020) is that of access to the source code (which appears as the expression of the program in the form and text written in a programming language) and the algorithm for public use (Cotino Hueso 2022). In other words, the source code appears as one of the fundamental elements (along with the characteristics and variables), but not the only one, for the knowledge of the functioning of the functional model of the digital algorithm. Access to the source code is a necessary but not sufficient condition for ensuring transparency (Gutiérrez David 2022). The aim is to ensure scrutiny of the public activity of systems that autonomise administrative activity.

Access to the source code and other elements of knowledge of the functional model of AI becomes important due to the need to exercise the rights of the administrators. In legal terms, the measure of transparency seems to be marked by the guarantee of the exercise of rights, including the right of defense. Access to the source code, the algorithm model, the documentation, and associated information (technical specifications, description and characterization of the dataset, etc.) will be the key to better understanding some pathologies of AI systems and the tool that will allow for the judicial review of autonomous administrative decisions (Gutiérrez David 2022), ensuring the right to full effective judicial protection. Therefore, the exercise of the right of access to the source code must be guaranteed.

Nonetheless, it is important to consider that rendering an algorithm comprehensible to the general public presents a significant challenge, primarily for two main reasons. First, translating lines of code into human language is a complex endeavor. Second, determining the extent to which the code should be open, including the elements required for a comprehensive understanding of the system while excluding modules that pose security risks, can be a difficult task (Cluzel-Métayer 2020).

5. Conclusions

This article allowed us to draw a number of conclusions at various levels. From the perspective of the impact that the implementation of AI systems has on public administration, we can conclude that they can bring some advantages from the perspective of citizens, as processes can be simplified, becoming faster and more accessible, by reducing bureaucracy and obsolete steps. From the perspective of their implementation in smart cities, these AI systems bring speed not only to the process of transforming cities but also (when well-applied) to increase the quality of life of citizens.

Looking at it from a legal standpoint, we must not overlook the necessity, in line with the principle of good administration, to provide adequate justification for all administrative actions facilitated by AI systems. This justification should consistently consider the unique characteristics of the administrative decisions where these systems are permitted.

Furthermore, it is crucial to recognize that these justification requirements should also consider the distinct features of AI systems employed by the public administration. Failure to ensure the comprehensibility of administrative decisions may ultimately render them invalid.

In addition to these conclusions, this research has allowed us to list some objectives for future research that, in addition to being very topical, are of great relevance. Thus, an investigation that seems to us to be very useful and practical would be the possibility of ascertaining the types of AI systems that can be adapted and applied at the level of smart governance, as well as the possibility of ascertaining what challenges the implementation of these technologies would bring to citizens in their daily lives, both in terms of the advantages it would bring in reducing bureaucratic processes.

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