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ABSTRACT

Artificial Intelligence (AI) has emerged as a transformative force in the 21st century, announced as one of the most significant investments across various sectors, such as healthcare, and public administration.

Throughout this thesis, we explore the profound implications of AI in administrative decision-making, examining both its immense potential and the inherent risks it poses. The introductory framework lays the groundwork by recognizing AI's status as the investment of the century, acting as a driver of advancement, while simultaneously posing complex challenges.

The first chapter of this thesis elucidates the opportunities and risks inherent in the AI paradigm. The "Black Box Phenomenon" highlights the opacity of AI decision-making processes, which can be inscrutable even to their creators. Furthermore, the thesis examines the issue of bias and possible errors stemming from flawed prior training data, exemplified by the Amazon case study.

Moving on, the second chapter provides an overview of the state of AI in Italy and the growing adoption of AI in administrative decisions, investigating both their benefits and overlaps, the latter illustrated via the MIUR algorithm case. It follows an investigation of regulatory norms governing the application of AI in administrative decisions within the Italian context, emphasizing the need for effective norms.

Consequently, the last chapter, Chapter 3, scrutinizes the White Papers on AI and explores the particular domain of contract and public procurement assessment using AI. It presents in particular the Legislative Decree n. 36/2023 which exhibits a huge step forward the AI adoption in public procurement.

By dissecting the opportunities, risks, and regulatory framework, this research contributes to a deeper understanding of AI's transformative potential in public administration, emphasizing the need for thoughtful and comprehensive governance in this era of technological advancement.

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INTRODUCTION

Artificial Intelligence is an epochal innovation that has fundamentally altered the way we perceive and interact with the world. The term "Artificial Intelligence" was first coined in 1955 by John McCarthy, who envisioned it as a field of study that would enable machines to "think" and "learn" like humans. However, once confined to the realms of science fiction and speculation, AI has rapidly become a pervasive and indispensable force, influencing a myriad of sectors and industries, from healthcare and finance to transportation, education, and therefore public administrations. Today, AI stands as the investment of the century, reshaping industries, economies, and societies. It has demonstrated its capacity to drive innovation, streamline processes, and enhance decision-making across various domains. Yet, this rapid proliferation of AI systems has also brought to the fore a host of intricate challenges and ethical dilemmas, especially when dealing with machine learning algorithms, improving autonomously without receiving detailed instructions from humans. One of the enigmatic aspects of AI is the "Black Box Phenomenon." As AI systems evolve and become more complex, the inner workings of these systems can seem inscrutable, even to their creators. Understanding how AI reaches its decisions, especially in critical areas like the public sector or legal matters, becomes a formidable challenge. Therefore, balancing AI's development within ethical boundaries is crucial. What legal foundations can ensure its diffusion while respecting the safety and fundamental rights of human beings?

While this augmented technology is already widely employed in the private sector, its progress in public administration is much slower.

Governments are eager to harness the potential benefits of AI for improving public services and decision-making. Unfortunately, the opacity of AI decision-making has raised concerns about accountability, fairness, and potential bias.

As with great power comes great responsibility, the adoption of AI in public administration brings with it a unique set of challenges and complexities. The need for transparency, accountability, and human supervision becomes paramount as well as the

need for ethical frameworks, as the consequences of AI decisions in this context can significantly impact individuals' lives, rights, and access to services.

The regulatory landscape governing AI is still evolving, both in Italy and across Europe, and many strategies, and policies have been developed and discussed under the leadership of the European Commission.

As we embark on this exploration, we are reminded of the words of Alan Turing, the pioneering computer scientist: "We can only see a short distance ahead, but we can see plenty there that needs to be done." In the realm of AI, where the future is constantly being reshaped by innovation and discovery, this sentiment resonates profoundly.

CHAPTER 1: INTRODUCTORY FRAMEWORK

ARTIFICIAL INTELLIGENCE, THE INVESTMENT OF THE CENTURY

Nowadays we have been experiencing high progress in the digital sphere, especially related to Artificial Intelligence and Machine Learning systems. The entire world, including the field of public administration, is trying to align towards this digitalization: moving from the digital transformation of procedures and documents in procurement, such as public contracts, and culminating in the creation of China's Smart City. This latter initiative represents a comprehensive integration of advanced technologies and data-driven systems to improve the efficiency, sustainability, and quality of urban life in many different areas of China such as Shanghai and Beijing. The final scope is to leverage artificial intelligence to enhance various aspects of city management, infrastructure, and services.

From the 16th century onwards, numerous European legends regarding the creation of artificial automata: mechanical automata, golems ¹, the Turk ², or Frankenstein. They were all imaginative or real attempts to artificially reproduce forms of intelligence.

Today those levels of cutting-edge represent our present life. We have been experiencing a fourth industrial revolution, mainly driven by the exponential growth in computing power, the availability of large amounts of data, and advances in Artificial Intelligence.

AI-based scanning systems diagnosing illnesses, self-driving cars, virtual digital assistants, and automation houses, are just a few results of the role that AI plays in us.

AI is the acronym standing for Artificial Intelligence, a term first time used by John McCarthy, an American computer engineer. Its phenomenon began in 1950, the publication year of the academic journal 'Mind' in the article 'Computing Machinery and

¹ Golems: Mythical creatures that, according to the legend, were locked away by the inventor "*Jehuda Löw*" himself in the 16th century for fear of losing control over them.

² The Turk was an 18th-century chess-playing automaton made by Wolfgang von Kempelen. It was presented as an autonomous machine capable of playing chess against human opponents. It toured Europe and the United States, competing against notable figures like Benjamin Franklin and Napoleon Bonaparte. The Turk was later revealed to be a clever illusion, as it contained a hidden compartment where a human chess player would operate the machine.

Intelligence’ by Alan Turing who questioned whether a machine is capable of thinking. He believed that a machine could be declared smart if, by subjecting it to the imitation game today known as the “Turing Test”, the person is deceived by the machine, failing to recognize that their interlocutor is a numerical calculator rather than another human being³.

Artificial Intelligence refers to systems that can be based on software that operate in a purely digital dimension (facial recognition systems, voice assistants, etc.). Alternatively, they might be embedded in hardware devices, which are physical devices (autonomous vehicles, drones, Internet of Things-related applications).

As the EU Commission declared, AI encompasses all those ‘systems that display intelligent behavior by analyzing their environment and taking actions – with some degree of autonomy – to achieve specific goals’⁴ (EU Commission, Brussels, 25.4.2018).

These systems make decisions via intelligent algorithms. An algorithm can be described as a precise collection of rules and instructions that must be adhered to in order to perform computations and resolve problems. Notably, one of the most significant advancements in this field in recent times has been the introduction of machine learning (ML) algorithms, which possess the ability to enhance their performance through experience and the utilization of data. This is particularly evident in supervised algorithms, in contrast to traditional algorithms, as well as in deep learning algorithms like AlphaGo⁵ and GPT-3⁶. Deep learning and reinforcement learning systems have garnered considerable attention due to their remarkable achievements, surpassing even human capabilities.⁷

³ S. Vantin, *Il diritto antidiscriminatorio nell’era digitale*, p.33

⁴ Definition developed for the purpose of the deliverables of the High-Level Expert Group on AI.

See <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52018DC0237>

⁵ AlphaGo is a computer program developed by DeepMind, an artificial intelligence (AI) research company acquired by Google in 2014. AlphaGo gained significant attention in 2016 when it defeated the world champion Go player, Lee Sedol, in a five-game match. Its development involves a combination of techniques, including deep neural networks and reinforcement learning. Initially, the program was trained on a large dataset of human Go games to learn patterns and strategies. It then used reinforcement learning, playing against itself millions of times to improve and refines its gameplay.

⁶ GPT-3, short for “Generative Pre-trained Transformer 3”, is an advanced language model developed by OpenAI. It is built upon a deep learning architecture known as the Transformer model, which uses self-attention mechanisms to understand and generate coherent text. It has been trained on a vast amount of diverse text data from the internet, allowing it to learn the statistical patterns and relationships in language.

⁷ A., A. Pajno, and F. Donati. *Intelligenza Artificiale e Diritto: Una Rivoluzione?*, 2022.

Artificial Intelligence can be considered the investment of the century since it has the potential to revolutionize many aspects of our society.

One of the most promising applications of AI is in the healthcare industry. AI systems can analyze vast amounts of medical data and provide insights into diseases, treatments, and patient outcomes. For instance, the Global Burden of Disease (GDP) is a research effort that “provides a comprehensive picture of mortality and disability across countries, time, age, and sex. It quantifies health loss from hundreds of diseases, injuries, and risk factors so that health systems can be improved and disparities eliminated”⁸.

Another important application of AI is in the transportation industry. Self-driving cars, for example, have the potential to improve traffic flow and increase mobility for individuals who are unable to drive. Waymo One, for instance, is an autonomous ride-hailing service⁹

In the public administration area, AI can be used to streamline government services, improve decision-making, and enhance public safety. For example, AI systems have been employed to predict where crimes are likely to occur, allowing law enforcement to allocate resources more effectively. A classic example would be the so-called “predictive policing algorithms”¹⁰.

All these disparate and unconventional applications of Artificial Intelligence are characterized by inadequate regulation, questioning many political science counterparts of their reliability, and whether they might threaten some of the law’s most fundamental concepts.

AI OPPORTUNITIES AND RISKS

Within the proposal of Brussels 21.4.2021, for the regulation of the European Parliament and the Council, it was announced that Artificial intelligence has the potential to foster

⁸ See at <https://www.healthdata.org/gbd>

⁹ Website: <https://waymo.com/waymo-one/>

¹⁰ They are computational models that use historical data, including crime reports, arrest records, and demographic information, and statistical analysis to forecast and anticipate where and when crimes are likely to occur. These algorithms aim to assist law enforcement agencies in allocating resources more effectively and proactively preventing criminal activities.

positive social and environmental outcomes, whereas simultaneously offering substantial advantages to businesses in terms of competition, potentially leading to economic growth. Hence, AI is typically pivotal in divisions that greatly affect society, such as climate change, environment and wellbeing, public services, finance, mobility, home affairs, and agriculture. Nevertheless, it is important to acknowledge that the very same elements and methodologies that drive the socioeconomic benefits of AI can also present novel dangers and unfavorable impacts on people and society as an entirety¹¹ (EU Commission, Brussels, 21.4.2021).

Several AI systems have the potential to show notable ethical dilemmas, potentially eroding established legal frameworks encompassing human rights, equality, and non-discrimination. These systems, whether intentioned or inadvertently, may violate such laws. Furthermore, there exists the plausibility that hostile foreign entities could exploit these systems to undermine democracy and jeopardize state security.

Indeed, despite their apparent effectiveness, these real-world applications possess numerous flaws, which can result in significant unintended consequences. As a result, policymakers and lawmakers must exercise caution when establishing the boundaries that govern their lawful utilization.

First, as today's AI is largely based on machine learning, these algorithms are often not transparent, explainable, or interpretable like traditional ones. This represents one of the biggest issues in this environment. In fact, they can pose challenges in reconstructing the sequence of events and instructions that led to a particular decision. This lack of transparency can make it arduous, or even impossible, to comprehend and evaluate the underlying rationale behind a decision. In essence, observers are left with nothing more than an opaque entity, commonly referred to as a "black box."

Secondly, and of equal importance, the decision-making process of artificial intelligence is inherently rooted in past events, relying on historical datasets. This characteristic exposes AI to potential risks associated with systemic biases. With the presence of appropriate datasets, there is a genuine concern that AI may engage in inappropriate discrimination based on social or racial factors. This concern is not merely hypothetical, as algorithms have exhibited discriminatory behavior against specific neighborhoods or

¹¹ See at <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52021PC0206>

economically disadvantaged ethnic groups, thereby denying them access to credit and health insurance, and even stigmatizing them as social threats.

BLACK BOX PHENOMENON

Machine Learning models are both intriguing and perilous compared to traditional algorithms due to their ability to handle intricate mechanical tasks, carry out decision-making functions, and make predictions based on learned rules from examples rather than explicit programming. These rules often lack interpretability for humans.

Consequently, while the outcomes may be highly accurate, there is no assurance that intelligent algorithms will disclose their reasoning process. This lack of transparency can give rise to issues, particularly in terms of reliability.

For instance, when a doctor relies on an ML-driven decision-support system for a diagnosis, they should comprehend the underlying processes in order to recommend an appropriate treatment. In situations where this understanding is absent, it becomes difficult to determine whether the system overlooked a critical factor that could impact the correct decision, and an incorrect treatment may lead to harm. Who ought to be held responsible in such cases? Should it be the computer, the manufacturer, the doctor, or the public administration that enabled the utilization of this specific software? The effect these systems can have on people's lives, coupled with limited access to information about the software and its outcomes, makes the decision-making process opaque. Consequently, these systems may not effectively adhere to relevant normative principles. How do we get justice in a system where we don't know how the algorithms are working?

Transparency is a fundamental concept in governance, technology, and various societal domains, serving as a key principle in fostering trust, accountability, and understanding. It is essential in countering the Black Box problem because it acts as a potent antidote to the potential abuse of power, manipulation, and the concentration of control in the hands of a few. By embracing transparency, individuals and institutions can ensure that their actions, intentions, and operations are open to scrutiny, reducing the likelihood of corruption, favoritism, or unethical practices taking root in the shadows. In essence, transparency acts as a safeguard, holding those in positions of authority accountable for their decisions and actions, and enhancing public trust in institutions and systems. It also

promotes fairness and equity by revealing hidden biases, discriminatory practices, or systemic inequalities that may be perpetuated unconsciously or deliberately.

Hence, transparency serves as a potent catalyst for societal progress and integrity within the black box phenomenon: without it, citizens would feel alienated from the very systems meant to serve them, some might gain unfair advantages, while others are left uninformed or disenfranchised. Louis Brandeis compared transparency to “sunlight, said to be the best of disinfectants” (Pasquale, 2015).

When dealing with an ML algorithm, due to the Black Box effect, it is not possible to access that algorithm’s decision root. This undermines a person’s right to be recognized and treated as a moral agent as he or she is not able to contest the decision.

In Italy, in 2015 there was this case where teachers were assigned to different regions than their specified preferences due to an automated sorting system implemented by the government¹². The teachers argued that the AI system used was faulty, therefore they sued the Ministry of Education. The Administrative Courts ruled that AI systems should not be used without understanding their logical paths, that individuals should be informed about the use of AI, and that human supervision is necessary when utilizing AI for administrative decisions¹³ since AI does not possess neither emotions and passion as humans, nor self-control in order to ensure it stays within pre-set limits.

In 2018 the European Commission established a High-Level Expert Group on AI that issued concrete ethical guidelines for trustworthy artificial intelligence on 8th April 2019. Under these guidelines, seven specific requirements are needed in order to consider AI systems trustworthy: human agency and oversight; technical robustness and safety; privacy and data governance; transparency, diversity, and non-discrimination; fairness, societal and environmental well-being; and accountability.¹⁴

¹² Law n. 107/2015-also called Buona Scuola

¹³ Consiglio di Stato, 10 Settembre 2018 (n. 09224, 09225, 09226, 09227, 09228, 09229). This is how the State Council upheld teachers’ appeal against the algorithm and its results.

¹⁴ For further details see:

European Commission and Independent High-Level Expert Group on Artificial Intelligence set up by the European Commission (2019) Ethics guidelines for trustworthy AI.

European Commission and Independent High-Level Expert Group on Artificial Intelligence set up by the European Commission (2019) Policy and Investment Recommendations for Trustworthy AI.

BIAS AND POSSIBLE ERRORS BASED ON POOR TRAINING DATA

As highlighted by the Youth for Technology Foundation, “AI is based on data and data is a reflection of our history, including historical societal prejudices and imbalances. Hence, the past dwells within our algorithms. The data embeds the past.”¹⁵

Within the decision-making process of AI algorithms, there might be the presence of bias errors, that are unfair or discriminatory treatments towards certain individuals or groups. These biases result in skewed outcomes that can perpetuate and amplify existing social inequalities. Biases can manifest in different forms, such as racial bias, gender bias, socioeconomic bias, and more, impacting various applications of AI, including hiring, lending, criminal justice, healthcare, and recommendation systems.

Biases can be unintentionally introduced into AI algorithms through various mechanisms. One of the primary sources of bias is biased training data. AI algorithms learn patterns and make predictions based on the data they are trained on. If the training data is not representative of the entire population, it may contain historical societal prejudices or imbalances, leading the AI model to replicate those biases. For example, if historical hiring data is biased towards favoring certain demographics, the AI model might learn to prioritize those groups, perpetuating discriminatory hiring practices. An illustrative instance of bias in artificial intelligence can be observed in the case of Amazon, where the company implemented and subsequently abandoned an AI recruiting tool in 2015 due to its inherent bias against women. The tool exhibited a discriminatory pattern by systematically rejecting all resumes from female candidates, demonstrating a preference for male applicants. The bias arose from the AI's self-learning mechanism, where it learned to favor candidates who utilized verbs commonly associated with male engineers' resumes, such as "executed" or "captured," while penalizing those resumes that included

European Commission and Independent High-Level Expert Group on Artificial Intelligence set up by the European Commission (2020) Assessment List for Trustworthy Artificial Intelligence (ALTAI) for self-assessment.

European Commission and Independent High-Level Expert Group on Artificial Intelligence set up by the European Commission (2020) AI HLEG-Sectoral Considerations on Policy and Investment Recommendations for Trustworthy AI.

¹⁵ “Facebook,” n.d. <https://www.facebook.com/YouthForTechnologyFoundation/posts/ai-is-based-on-data-and-data-is-a-reflection-of-our-history-so-the-past-dwells-w/10165605731090346/>.

terms like "women's". This incident exemplifies a clear case of gender bias. However, it should be noted that the root issue lies in Amazon's computer models being trained on a decade-long dataset of resumes submitted to the company, which was primarily dominated by male applicants. This dataset reflected the broader male dominance prevalent within the technology industry, as illustrated by the fact that fewer than 14% of AI researchers are women.¹⁶ The amalgamation of such biased data and the AI's learning process contributed to the observed gender bias in the recruiting tool.

Biases might also come from human designers' and developers' own biases unintentionally, sometimes intentionally, or from flawed algorithms.

Indeed, the European Parliament Resolution of 14/03/2017 on the implications of Big Data for fundamental rights: privacy, data protection, non-discrimination, security, and law enforcement, stresses in Article 21 the "necessity not only for algorithmic transparency, but also for transparency about possible biases in training data used to make inferences based on Big Data"¹⁷ which means that companies should periodically evaluate the data, and assess whether it has unbiased elements and if so, develop strategies to overcome these problems (art. 22).

AI algorithms are often wrongly set as "Neutral", with their operations being legitimized due to their supposedly impersonal and objective rationality. This might cause invisibility for the most vulnerable groups. By dealing with automated systems, those results will be considered neutral as well, denying future social opportunities. However, technology is not neutral in its application and it is even less for those who working on business development get to decide what is right and what is not. In fact, artificial intelligence systems are not smart calculators, they are just capable of learning and emulating human reasoning processes through training and learning techniques. Therefore, an AI system can learn both smart and foolish notions, both correct and wrong notions, both ethical and unethical notions, and it can reproduce all of them without making distinctions and without understanding.

An example is the use of an algorithm to calculate recidivism or an algorithm to assess a person's financial reliability when applying for a loan: if a person is deemed unreliable,

¹⁶ Documentary "Coded bias", Shalini Kantayya

¹⁷ See at https://www.europarl.europa.eu/doceo/document/TA-8-2017-0076_IT.html

how accurate is this assessment? In the event that in the future, the same person is no longer in debt and leads a mindful life, would the system recognize this alter, or would it still categorize that individual as "questionable"? In this manner, another imperative factor to consider is the algorithm's capacity to update itself over time. Entrusting a decision of the public or private sector to an artificial intelligence system (where the term intelligence might be highly misunderstood) raises the issue of responsibility for the choices made by the system. If, for instance, the correction of a public competition task is entrusted to an AI, and the AI erroneously excludes a candidate, who will be held accountable for the mistake?

Fortunately, the public administration, with the hope of achieving interoperability of its information and involving people in decision-making processes, is increasingly creating ecosystems or digital policy areas trying to ensure cybersecurity.

Both black box risk and risk of bias are part of the performance risk and both can be mitigated only with specific regulations that are going to be analyzed in the following chapter.

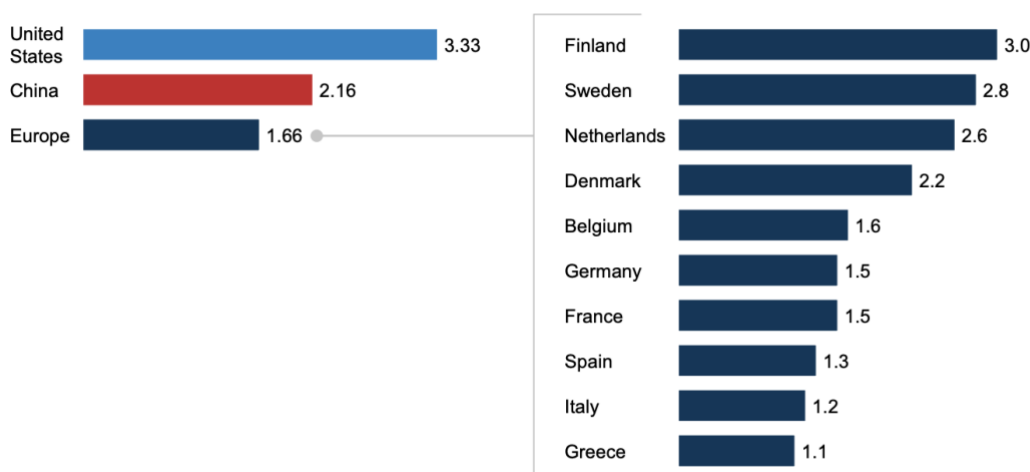
CHAPTER 2: NORMS REGULATING THE AI APPLICATION FOR ADMINISTRATIVE DECISIONS

ARTIFICIAL INTELLIGENCE STATE OF ART IN ITALY

The realm of artificial intelligence has emerged as a force with wide-ranging implications across global societies, economies, and industries and it has stepped into the forefront of Italy's technological landscape, along with other countries, captivating the attention of various sectors and stakeholders.

The Italian and European enterprises suffer from a lag in the adoption and spread of digital technologies compared to great American and Chinese competitors.

A demonstration is the percentage of the digital and AI sector of the gross domestic product: in Europe around 1.7% of the GDP, in Italy 1.2%, in China 2.2%, and in the USA 3.3%.



¹ Digital share of ICT value added is estimated by taking the share of revenue made through digital channels and by taking the portion of cost of all functions performed digitally.

Fig.1: Percentage of GDP of the digital and AI sector

SOURCE: Directorate-General for Research and Innovation, European Commission, 2018; McKinsey Digital Survey, 2018; Mckinsey Global Institute analysis

The Italian AI ecosystem is described as an interaction among three components: Research and Innovation, Production, and Adoption.

- *Research and Innovation*: includes entities such as universities and public/private research centers as well as the Technology Clusters¹⁸ which are financed by MIUR, the Competence Centers, and the Digital Innovation Hubs. This environment needs to be strengthened in order to increase competitiveness against other countries (publications in the field of AI are not enough in Italy). Nevertheless, In Trento, Italy, we see the realization of the TasLab, a collaborative cluster strategy aimed at establishing a sophisticated innovation infrastructure. Local and regional authorities initiated four expansive open data initiatives, launched e-government gateways, and allocated resources to enhance business and citizen-centric infrastructure. This Lab has attracted more than 800 world-class researchers and prominent enterprises such as IBM, Nokia, and Siemens.
- *Production*: comprises the software industry, industrial automation, IoT systems, and robotics.
- *Adoption*: encompasses the Public Administration (PA) that is responsible for security, smart cities, environmental sustainability, and education. Adoption also includes the industry in which AI utilization is pretty intense.

While in the realms of research and production, the relationship with other European Union member states should be more about cooperation than competition, adoption, on the other hand, is a domain that needs to constantly evolve and, to do so, requires competitiveness.

Despite Italy's low level of digitization, some unique characteristics of our production system allow us to assert that Italy could position itself in the field of AI better than one might imagine. Firstly, the strong resilience of the Italian production system attests to the

¹⁸ For further details: <https://www.mur.gov.it/it/aree-tematiche/ricerca/iniziativa-speciali-e-grandi-ricerche/cluster-tecnologici-nazionali>

ability of a wide range of businesses to react swiftly and with considerable success to changing internal and external conditions, typical of periods of significant transformation such as the ones we are experiencing; *made in Italy* has overcome terrible conditions such as the Second World War, and the inflation of the 1970s.

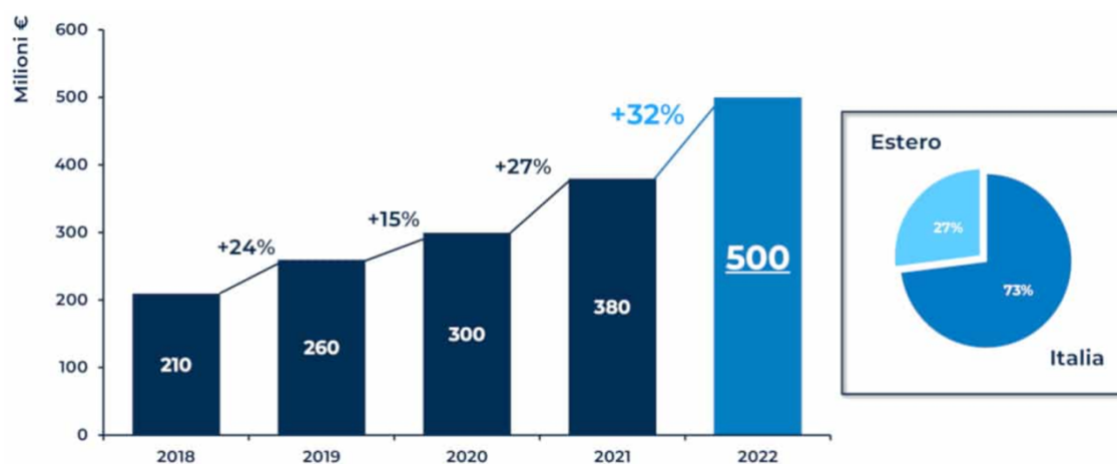
Furthermore, the nature of our economic system, marked by a smaller average company size compared to the European level and a strong family presence, represents a competitive advantage in these circumstances, promoting greater responsiveness towards technology implementation. Yet, the technology implementation within the Italian system which is based on small and medium-sized enterprises (SMEs), is aided by the availability of low-cost technologies.

To have a significant impact on the global scientific and economic landscape, investments and resources, both human and material, are essential.

Therefore, Italy should invest more in six specific areas in particular: IoT, manufacturing, and robotics (for which Italy is already one of the main leaders in the world¹⁹); Services, healthcare, and finance; Transports and energy, Aerospace and defense; PA; Culture, creativity, and digital humanities.

According to the studies of the AI Observatory at Politecnico of Milan, Italian companies investing in AI have experienced significant growth in the last five years.

In the picture below it is shown the giant strides that the Italian AI market has taken, probably mainly driven by the COVID-19 pandemic of 2019/2020.



¹⁹ Source International Federation of Robotics, annual report "Industrial Report" 2018

Fig. 2: The Italian AI market growth.

SOURCE: Osservatorio Artificial Intelligence del Politecnico di Milano

The market has reached €500 million in 2022, with a growth of 32% only in one year. 73% of those revenues were commissioned by Italian companies (365 million euros), and the remaining 27% from export projects (135 million euros).

Today more than 60% of large Italian companies have already initiated at least one AI project, while among small and medium-sized enterprises, the value is around 15%.

93% of the Italian population has already heard about Artificial Intelligence, 55% of it states that AI is very prevalent in their daily life, whereas 37% declares it is in their work life.

Nevertheless, 73% of the Italian population fears the advent of AI due to many different factors such as the insufficiency of proper awareness and adequate regulation.

In this regard, the European Commission has released the so-called “White papers”²⁰, yet there are several initiatives to promote the spread of AI: AIHub, a channel updated daily by experts in the field, and shared on social media²¹; Digital Academy, which would encompass programs and videos related to digital topics²².

Moreover, to promote the adoption of AI systems, Italy has launched the new Strategic Program for Artificial Intelligence²³ which thanks to the joint work of three ministries has produced 24 policies that have been adopted from 2022 up to 2024.

One of the areas where the program is aiming to focus more is the adoption of AI in public administration (PA).

ADOPTION OF AI FOR ITALIAN ADMINISTRATIVE DECISIONS

The increasing pervasiveness of technological development, particularly concerning AI, in recent decades, has brought a process of computerization and modernization of the public administration which is referred to as “e-government”.

²⁰ The White Papers are further discussed within the 3rd Chapter of this paper.

²¹ If interested take a look at the website: <https://aihub.group/>

²² If interested take a look at the website: <https://www.digitalacademy.it/>

²³ The full program can be found here: <https://assets.innovazione.gov.it/1637777289-programma-strategico-iaweb.pdf>

The latter term is defined by the European Commission, within the Communication of September 26, 2003, as “the use of information and communication technologies in public administrations, combined with organizational change and new skills in order to improve public services and democratic processes and strengthen support to public policies”²⁴ [COM(2003)567]. Indeed, it is believed that AI will optimize administrative processes, both lowering the costs and improving the quality of the services for citizens: better flow management, virtual assistants, optimization of human resources, regulatory simplification via coding, better inspections based on a risk/data-based model, systems against tax evasion and other illegal performances.

Over time, the notion of e-government has varied about advances in ICT²⁵, which is a constantly changing domain.

In fact, from PA model 1.0 characterized by the exclusive use of paper, and writing machines, we switched to PA 2.0 which encompasses the use of computers, printers, and fax machines, then to PA 3.0 that sees the implementation of the internet, digital portals, mobile applications, and social networks, up to PA 4.0 with the introduction of AI systems.

Even though the pandemic emergency of 2019/2020 has facilitated the acceleration in the digitalization process of administrative activities, there is still a long way to go.

Nowadays the public administration (PA) has been collecting much more data day by day in order to provide more efficient services. However, the collection of personal data, along with the process of automated systems, is a very disputed task as this action must respect specific conditions such as the principle of transparency, the principle of accountability, and in general the legal framework.

As explicitly reiterated by Europe, and stipulated by Italy from dl 179/2012, public sector data belongs to the citizens, are state property, and must be accessible to everyone

²⁴ <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2003:0567:FIN:EN:PDF>

²⁵ ICT stands for Information and Communication Technology and it refers to all the technologies used to process, transmit, and store information and data. It includes computers, communication networks, software, hardware and other digital technologies that enable the management and sharing of information. The term ICT became widely used in the 1990s to reflect the evolution of digital technologies and the growing role of communications and information technology in society and the economy. This term partly replaced the earlier term “IT” (Information Technology) to also include aspects of communication and connectivity.

concerning the GDPR²⁶. Hence, regarding PA, there has been a closer approach to open data. Therefore, datasets and information have been made available by government agencies and public institutions for free access, use, and distribution by the general public. These datasets typically include information about government activities, services, expenditures, demographics, and more. The goal of providing open data is to increase transparency, accountability, and citizen engagement in government processes while encouraging the principle of interoperability among the systems implemented by different public bodies.

The new framework generated by the adoption of AI for administrative decisions leads to changes that threaten to affect the administrative organization, the administrative procedure, and the accountability system of administrative decisions.

On many occasions in Italy, we have heard about the term “digitalizzazione di facciata” as the digitalization process is implemented via legal and technological methods that merely transpose onto computers and the network, models of action and organizational solutions rooted in the traditional paper-based dimension (Francesco Caio, 2014) due to the high rate of bureaucracy occurring in our country.

While the legislation doesn't offer adequate responses concerning the new challenges, the legitimacy of an algorithmic decision must be verified differently, and the administrative justice is dealing with it by applying to the new issues the principles of administrative procedure.

Furthermore, three specific levels of automation for algorithmic decisions have been designed. The first one represents the level of full automation in which there is no human contribution at all and therefore the decision is elaborated entirely by the algorithm. This process is allowed when the algorithm activity is strictly pre-determined by the technical rule and there are not too many margins for choice.

The second level is characterized by both a certain level of automation and strict human intervention. The third one is instead composed of a combination of automation and prediction.

²⁶ General Data Protection Regulation. It was adopted in 2016 with ruling n. 679. More information is provided later on.

Initially, the direction was toward the exclusion of eligibility for automated decisions (indeed in 1990 the law n.241 that regulates public decisions does not contemplate the possibility of using an automated process, if not only the incentives to use telematics thanks to the art.3bis, introduced in 2005) until new measures in their favor are being considered with appropriate safeguards.

The necessity for the public administration digitization process was already indirectly established within the Unified Text on Administrative Documentation (Presidential Decree n. 445/2000) and the Digital Administration Code (Legislative Decree n.82/2005), and then consolidated Within Legislative Decree no. 179/2016 and its subsequent amendment (Legislative Decree of 13 December 2017, no. 217), which explicitly call for the redefinition of procedures and the organization of Public Administrations according to the "digital first" principle. This latter principle represents the strategy where digital technologies and solutions are prioritized in the design, development, and delivery of services, processes, and interactions. It emphasizes the idea that digital channels and tools should be the primary or preferred means for citizens, businesses, and government entities to access and engage with various services, information, and transactions.

However, this strategy is hard to manage in the case of an AI system since it might work against fundamental rights as already mentioned. To depict the cases in which this happens, any legislator aiming to regulate AI must preliminarily define the three main phases of AI: its development, its dissemination, and the use of its related technologies and components. The higher the risk that the product may escape human control, the more stringent the human intervention must be. This involves adopting an anthropocentric approach which, also confirmed by article 22 of GDPR²⁷, underscores the importance of ensuring human oversight for the procedure's legitimacy, intending to avoid possible machine biases.

Indeed, "Computer procedures, even if they reach their highest level of accuracy and even perfection, can never fully supplant the cognitive, investigatory, and judgmental activity that only an inquiry conducted by a human official can perform" (TAR Lazio, Section III bis, judgment No. 10964/2019).

²⁷ It prohibits subjecting an individual to a fully automated procedure that could greatly impact their personal legal sphere.

An automated AI system might cause dynamics of the so-called “bureaucratic depersonalization”: if on the one hand, it is very efficient when handling large quantities of data, on the other hand, the system lacks of contextual understanding that a human approach could offer, leading to decisions or actions deprived of empathy, and causing frustration among citizens or the users of public services.

Furthermore, other concerns must be taken into account on the front of AI adoption in the PA such as the potential limitation of fundamental rights, along with those designed by the European personal data protection regulation, the principles of “transparency” (everyone must know those automated systems involving them)²⁸, “non-exclusivity” (to produce its result, the machine must interact with the human being)²⁹, and “non-discrimination”(automated procedures must not cause discriminatory effects against individuals)³⁰.

Here, the fundamental ruling n. 8472 of 2019 needs to be referenced. It draws the general statute of automated administrative functions around the three fundamental principles.

The Council of State exploits them in order to establish the inability of the public administration to exclusively and totally entrust an automated algorithm with decisions requiring the exercise of discretionary judgment³¹.

Hence, it is admissible to use non-discretionary automated decisions as “The absence of human intervention in a purely automatic classification activity of numerous instances according to predetermined rules (which are, indeed, created by humans), and the delegation of this activity to be an efficient electronic processor, appear as necessary interpretations of Article 97 of the Constitution³², consistent with the current technological evolution” (State Council, ruling n. 2270).

²⁸ Consiglio di Stato, sezione VI, 13 dicembre 2019, n. 8474, cit., par. 15.1

²⁹ Consiglio di Stato, sezione III bis, n. 10964 del 2019.

This concept derives from art. 22 of GDPR.

³⁰ The principle derives from the Recital71 of the GDPR.

³¹ This term refers to the capacity and authority of an administrative entity to make decisions flexibly and based on its own evaluation, even when there are no specific rules or directions to be followed. In other words, it involves the discretion or margin of manoeuvre that administrative authorities have in applying laws and regulations to specific situations that arise. However, this discretion is not unlimited and must be exercised in accordance with the principles of fairness, impartiality, and legality.

³² It establishes the judicial organization which is based on the concept of “natural judge” previously decided by law.

Although the exercise of administrative discretion cannot concern the procedural stage materially carried out by the digital tool, it can in the earlier phase consisting of the processing of the instrument itself.

The Council of State has established two fundamental principles for the legitimacy of algorithms, which are the principle of transparency, already mentioned and strictly related to the principle of “right of access”, and the principle of “accountability” (the decision issued by the algorithm is imputed to the body holding the power who must be able to carry out the necessary verification of the logical and legitimacy of the choice and outcomes entrusted to the algorithm³³)³⁴.

The public administration’s responsibility for the activity carried out by the algorithm should take into account the challenge that this institution might face in deciphering the computer language in which the algorithm is expressed, for which advanced skills are believed to be vital.

In fact, the programming language entails, for the algorithm, the incapacity to adhere to the principles of transparency established by the administrative act: it is believed that, even if the program were made known, it would still be incomprehensible to most.

BENEFITS AND OVERLAPS RELATED TO THE ADOPTION OF AI FOR ADMINISTRATIVE DECISIONS

The ongoing process of digitization sweeping through society is increasingly influencing administrative operations and methodologies. This not only leads to the digitization of public activities and interactions between administrative authorities and private entities, aimed at simplification and modernization, but also entails the adoption of digital tools and technologies that reshape the dynamics and methods of its implementation bringing with it risks that legal science has long focused on: risks to privacy, citizens’ security, fundamental rights, and even democratic principles.

As we have learned so far, automated AI decisions entail two related problems. The first one deals with the insufficient understanding of the performance of machine learning

³³ Consiglio di Stato, Sez. VI, sentenza del 4 febbraio 2020, n. 881; Consiglio di Stato, Sez. VI, sentenze del 13 dicembre 2019, n. 8472-8473-8474.

³⁴ Those principles will be discussed later.

algorithms when contrasted with human judgment. The second one relates to the machine's incapacity to explain the reasons behind the decision. These circumstances are caused generally by the most advanced AI applications that make the system opaque, hard to grasp, not always dependable, and at times discriminatory (due to potential biases it may incorporate), hence casting doubt on its compatibility with the principles of transparency, justification, involvement, and impartiality to which administrative action is subjected.

The key points from which the main issues related to the use of machine learning algorithms in public administration arise are three: algorithm explicability; autonomy of action (how to attribute administrative actions); outcome control (how to ensure the legitimacy of administrative decisions).

Algorithm explicability: When algorithms are used, the decision is made via learning processes of their own, creating difficulty in explaining the process behind the decision made. However, when dealing with administrative activities the decisions must be based on an empowering regulation, hence it is necessary to identify the entity responsible for making such a choice, the pursued objective, the public interest underlying a specific decision, as well as the methods and legal consequences that derive from it.

In the case of AI systems, it is not always possible to detect those factors due to the way the machine works. It is typically fed with a large amount of data (input data) that should solve a problem of classification, identification, or prediction, and generate the so-called "output" data. The issue is that to solve that particular problem, the models are designed with numerous layers and thousands or even millions of parameters. Therefore, the inputs go through intricate transformations, making it difficult to understand how specific input features influence the output. This struggle is even greater when models operate in high-dimensional feature spaces, where data points are represented by so numerous features that understanding the impact of each feature on the outcome becomes extremely challenging. This is especially true when dealing with images, audio, or textual data, where each pixel, frequency, or word can contribute to the final decision. Moreover, there are models which employ non-linear activation functions within their layers capturing intricate data patterns but also introducing complexities that are hard to explain in human-interpretable terms.

In conclusion, even though these machine learning algorithms have great capacity for generating high rates of accuracy, they may not be capable of determining the steps leading to the final output.

Furthermore, even though the developer might be able to provide a technical explanation, the user does not have his knowledge. Here another problem arises: the technical-mathematical factor. The collaboration between legal and technical knowledge, aimed at achieving a common objective, must utilize a language that is comprehensible to all those receiving the decisions. For this reason, the understanding of the source code by administrative officials necessitates a robust digital education program. However, this process is complex in terms of interpretability and explainability as already argued, specialized terminology for both fields, regulatory framework i.e., trying to align legal requirements with technical capabilities, and accountability and responsibility.

Previously many administrative judges agreed that automated decisions violated Article 97 of the Constitution, as well as Articles 3,7, and subsequent articles of Law No. 241/1990, which regulate the obligation of justification, procedural participation, and personal interaction. [I giudici ribadiscono come la fonte dell'illegittimità...Vedi "l'algoritmo intelligente" slide 5]. Nevertheless, subsequent rulings are more open to the legitimacy and usefulness of using algorithms.

Autonomy of action: technological advancements deeply impact the core of the legal phenomenon itself, establishing the "causal relationship between events". Consequently, it influences the demarcation between the acting activity and the instruments employed. Historically, technology has been classified as tools or instruments through which decision-makers (physical persons) exercise their choices. However, a notable paradigm shift is in progress, as algorithms, once merely tools, are now striving to evolve into autonomous agents. Therefore, defining the accountable party for an event becomes intricate considering that attributing the causation of an event to a machine was previously unimaginable. This shift of technology's role from a tool to an autonomous agent is a result of both direct and indirect transformations.

Directly, this transition is driven by an increasingly evident societal reliance on technology, explicitly delegating automated systems to make decisions on behalf of humans. Indirectly, it signifies the broader trend where collective decision-making

increasingly relies on machine-sourced information, thereby leading to decision-making data being routed through technological interfaces.

Nevertheless, despite this transformation of technology from a tool to an agent, it remains undeniable that utilizing decision-making algorithms does not grant administrations the authority to enact administrative actions without lawful authorization.

In certain legal contexts, such as Italy, artificial intelligence systems cannot entirely replace the cognitive, discerning, and judgmental faculties of human administrators. This situation introduces an additional layer of complexity. External entities, rather than the administrative body itself, often implement AI systems, transferring a degree of decision-making power from human officials to those who design and implement the algorithm. The software is not directly attributable to the public official, but rather to specialized programmers in the field.³⁵ Consequently, although traditional accountability falls upon the human official, there is a plausible argument that the center of responsibility attribution could shift during the algorithm's design and construction phase, rather than its eventual usage.

These dilemmas associated with responsibility are further compounded by the separation between the operator of the tool and the holder of the service. Additionally, many contemplate the potential for attributing a degree of subjectivity and legal identity to AI applications. Such a development could entail the granting of legal rights and responsibilities to these applications, including the assumption of accountability for their actions.³⁶

Outcome Control: At this point, it is unavoidable to ask the question "What powers can be given to a machine, and within what boundaries?" The issue is not related to the decision itself, but rather the manner in which this is developed. Considering the nature of a decision made within the public sphere, it becomes imperative for it to be embraced by the citizens. For widespread acceptance, it needs to be comprehensible. As a priority, this underscores the importance of legislation ensuring the fostering and complete

³⁵ See: <https://www.sipotra.it/wp-content/uploads/2019/12/L%E2%80%99ALGORITMO-INTELLIGENTE-MA-NON-TROPPO.pdf>

³⁶ Faini F., "Intelligenza artificiale e diritto: le sfide giuridiche in ambito pubblico." *BioLaw Journal-Rivista di BioDiritto* 1 (2019)

development of AI while simultaneously safeguarding against potential abuses of individual rights.

Latzer et al. (2014)³⁷ identify nine categories of risk that accompany algorithmic selection and that give birth to the so-called algorithms of oppression, algorithmic manipulation, algorithmic law-breaking, and so on:

1. Manipulation
2. Diminishing variety, the creation of echo chambers and filter bubbles, biases and distortions of reality
3. Constraints on the freedom of communication and expression, such as censorship by intelligent filtering
4. Social discrimination
5. Violation of intellectual property rights
6. Abuse of market power
7. Effects on cognitive capabilities and the human brain
8. Growing heteronomy and loss of human sovereignty and controllability of technology

Some of them have already been discussed, and some of them will not be the subject of our analysis, but they are all the consequence of what Amore (2017)³⁸ used to believe, that bias is “intrinsic to the algorithm”.

Surveillance is another exponential risk that is strongly relevant to the objective of this paper.

Collecting and processing enormous quantities of data consequently confers an enormous power, especially in the public sphere. If this process is not done properly, solutions can lead to an imbalance in accessing information, resulting in an asymmetry of informational power. Furthermore, an additional potential risk tied to social control emerges: public entities might choose to utilize the data generated and managed by artificial intelligence

³⁷ Latzer, Michael, Katharina Hollnbuchner, Natascha Just, and Florian Saurwein. “The Economics of Algorithmic Selection on the Internet.” ResearchGate, October 21, 2014. <https://doi.org/10.5167/uzh-100400>.

³⁸ Amore, Louise, and Rita Raley. “Securing with Algorithms: Knowledge, Decision, Sovereignty.” Security Dialogue 48, no. 1 (December 12, 2016): 3–10. <https://doi.org/10.1177/0967010616680753>.

solutions for purposes beyond those for which they were designed, potentially allowing for forms of surveillance of the population, especially when these operations occur opaquely to users. A practical example might be the case revealed by Edward Snowden about NSA, the National Security Agency, that under the excuse of the prevention of terrorist attacks used to monitor almost every citizen without being aware. NSA's capacity to hide all its operations and to monitor everyone was made possible due to the electronic surveillance programs.³⁹

All the changes discussed above share a common foundation in the lack of transparency and openness in data and algorithm management processes, in the significant imbalance between parties involved, and in the resulting incapacity of individuals to safeguard themselves. Within this context, the role of human beings and the legal framework becomes crucial for effectively governing artificial intelligence and safeguarding individual rights and freedoms. Therefore, to address artificial intelligence solutions effectively in the public sphere, it is essential to emphasize and apply certain principles that serve as potential remedies to these issues. These principles can be summarized as follows: technical expertise, ethical considerations, accountability, transparency, and openness.

Within the European Regulation 2016/679, there are indeed innovative principles that can counterbalance the aforementioned risks by leveraging technology. These are the tools of privacy by design and by default. The former, analyzed in Article 25, paragraph 1 of Regulation (EU) 2016/679, stipulates that the data controller must implement "appropriate technical and organizational measures, such as pseudonymization" (Article 4, paragraph 1, n. 5), "intended to effectively implement data protection principles, such as minimization, and to integrate the necessary safeguards into the processing to meet the requirements of the regulation and protect the rights of the data subjects" both during the selection of processing means and throughout the processing itself. The responsibility of consistently monitoring the processing falls upon the owner, given their comprehensive understanding of the structure and organizational procedures involved. The data

³⁹ Luke Harding- Snowden, la vera storia dell'uomo più ricercato del mondo.

For more information visit this site: https://www.treccani.it/enciclopedia/il-caso-snowden-e-le-conseguenze-diplomatiche-del-datagate_%28Atlante-Geopolitico%29/

controller's responsibilities should be assessed considering technological advancements, implementation expenses, as well as the nature, extent, context, and objectives of the processing. By doing so, the legislator achieves a balance between the data controller's economic concerns, connected to the financial feasibility of the required techniques, and the data subject's requirement to safeguard their data. Continuing along this line, the principle of privacy by default ensues. This latter principle entails that the data controller must implement "appropriate technical and organizational measures to ensure that, by default, only personal data necessary for each specific purpose of the processing are processed." This obligation applies to the amount of personal data collected, the scope of the processing, the retention period, and their accessibility. The individual's protection is further sustained, as this provision prevents an indefinite number of individuals from being accessed by machines (without human intervention), and it stipulates that the obligation is adjusted considering factors such as the volume of data, the scope of processing, the retention period, and accessibility.

Among the ongoing debates and critiques surrounding the utilization of AI systems in the public sphere, it remains undeniable that their implementation has become an essential facet of contemporary governance. While concerns regarding transparency, accountability, and potential biases have been raised, the undeniable truth is that the adoption of AI technology in the public sector yields a multitude of significant and indispensable benefits.

These advancements have the potential to revolutionize administrative operations, enhance decision-making processes, and streamline public services, thereby underscoring the crucial role AI plays in shaping modern governance despite the challenges it presents. With the public administration being under a modernization process, which our country is pursuing through the Agency for Digital Italy (AGID) and its white paper⁴⁰, the benefits have been substantial in both economic and technological terms.

Such advantages range from the reduction of "procedural timing for purely repetitive and non-discretionary operations" to the "exclusion of interferences arising from negligence (or worse, misconduct) by the human official."

⁴⁰ They will be highly discussed within Chapter 3.

Through advanced algorithms and computational power, AI can swiftly analyze data sets that would be overwhelming for human administrators to process manually. By doing so, AI brings to light patterns, trends, and correlations within the data that might go unnoticed by human observers. AI contributes to enhanced accuracy in administrative tasks by mitigating errors stemming from human fatigue or oversight. Repetitive tasks that could lead to inconsistencies due to human limitations are executed flawlessly by AI systems. For instance, in data validation, AI can systematically check and cleanse datasets, ensuring accuracy and integrity. Fraud detection is another area where AI excels; it can rapidly sift through large datasets to identify anomalous patterns that may indicate fraudulent activities. Additionally, in compliance monitoring, AI systems can consistently monitor and assess data against regulatory standards, reducing the risk of compliance breaches.

The ability to rely on a certain timeline enables the pursuit of dual interests: that of the administration in promptly tending to the public interest, and that of private entities who should be able to plan their activities leveraging the prompt adoption of necessary administrative acts.

These new systems appear capable of facilitating competition among economic operators subject to administrative measures, through quicker decision times and an increase in the predictability coefficient of the outcomes. Moreover, the reduction in processing times also leads to cost savings by decreasing the number of appeals against administrative silence, compensation claims for delays, as well as instances of resorting to substitute powers.

Furthermore, among the enhancing consequences of digitization, is the fact that machines, unlike humans, cannot be swayed by corruption and are immune to human negligence. Of course, this holds only if the public administration has appropriately engineered the architecture underlying the algorithm.

EFFECTIVE NORMS

Over the years, several laws and initiatives have been promoted in Italy, and in general in Europe, to encourage the digitization of public administration (PA) and to promote the

development and diffusion of Artificial Intelligence that constitutes the architrave for the delivery of digital services in the domestic and global marketplace.

Some of the most significant ones include the Italian Digital Agenda, Code of Digital Administration, GDPR, AI Act, Digital Market Act, Digital Service Act, National Digital Data Platform, and the National Strategy for Artificial Intelligence⁴¹.

Italian Digital Agenda - Legislative Decree 179/2012

This decree promotes the adoption of digital technologies at the national level, setting specific goals for the digitization of public administration, the provision of online services, and the digital participation of citizens. Among the objectives and areas of intervention of the Italian Digital Agenda are: E-Government, Connectivity and Broadband, Economic Growth and Innovation, Digital Culture, Education and Digital Skills; Innovation in the Public Sector, Cybersecurity⁴². Its implementation is guaranteed by AgiD (Agenzia per l'Italia Digitale) that is the technical agency of the Council Presidency of Information, technology, communication, as well as Digital Transformation, whose objective is to sustain digital innovation and promote the development and diffusion of digital skills while cooperating with international, national, and local institutions and bodies.

Code of Digital Administration (CAD)

A legislative decree, known as the CAD (Digital Administration Code), was dedicated to digital administration under the legislative decree of March 7, 2005, No. 82. It constitutes a set of rules and regulations in Italy that govern the adoption and use of information and communication technologies in the public administration, in line with the principles of cost-effectiveness, efficiency, impartiality, publicity, and transparency, as stipulated in Article 1 of Law No. 241 of 1990, while also upholding the principles of equality and non-discrimination. The CAD establishes guidelines for the management and storage of

⁴¹ This strategic plan will be further elaborated in the third chapter.

⁴² For more details see:

https://www.agid.gov.it/sites/default/files/repository_files/leggi_decreti_direttive/dl-18-ottobre-2012-n.179_0.pdf

<https://leg16.camera.it/561?appro=818>

digital documents, transparency in administrative actions, and accessibility to online services.

Indeed, according to the CAD, public administrations are required to embrace the fundamental "digital first" principle internally. The CAD enumerates a list of rights for citizens and businesses, including the right to their own digital identity, the right to communicate and participate digitally, the right to their digital domicile, the right to simple and integrated online services, the right to digital literacy, the right not to present certificates to public administrations, the right to digital administrative transparency, the right to the protection of their digital data, and the right to accessibility and usability.

General Data Protection Rights (GDPR)

When it comes to artificial intelligence systems, so therefore algorithms, one cannot avoid discussing data, which is what the machine feeds on to generate results. There are various types of data. First and foremost, they are categorized as personal and non-personal. They are further classified into sensitive data⁴³, biometric data⁴⁴, geolocational data⁴⁵, and so forth. In a world where the personal data of anyone, in any context and location, are constantly generated, collected, and analyzed, a regulatory act is necessary to protect the citizen and, in particular, the fundamental right to privacy. The General Data Protection Regulation (GDPR), the regulation (EU) 2016/679, following the provisions specifically laid down in Article 8 of the Nice Charter⁴⁶ concerning the protection of personal data relating to each individual, is the one that establishes rules concerning the protection of natural persons about the processing of personal data and their free movement. Even though the regulation operates at the European level, it has been so successful that it has

⁴³ Personal data that reveal sensitive or particularly protected information, such as racial or ethnic origin, political opinions, religious beliefs, health status, sexual orientation, etc. These data are typically subject to more stringent restrictions in terms of collection and processing due to their potential impact on privacy and fundamental rights.

⁴⁴ They are described by Article 4(1)(14) of the Regulation as "personal data resulting from specific technical processing relating to the physical, physiological or behavioural characteristics of a natural person, which allow or confirm the unique identification of that natural person, such as facial images or fingerprint data".

⁴⁵ Data that indicate the geographical location of an individual, often through mobile devices or GPS sensors.

⁴⁶ Also called "Charter of Fundamental Rights of the European Union". It is a document that lists and safeguards the fundamental rights of the citizens of the European Union. The Charter was established in the year 2000 in Nice, France.

reached a global influence. The GDPR is organized into 11 chapters, covering various aspects of data protection. These chapters encompass the following subjects: general provisions (articles 1-4), principles guiding the discipline (articles 5-11), rights of data subjects (articles 12-23), roles of data controllers and processors (articles 24-43), transfers of personal data to third countries or international organizations (articles 44-50), roles of independent supervisory authorities (articles 51-59), cooperation and consistency mechanisms, including the European Data Protection Board (Articles 60-76), remedies, liability, and penalties (Articles 77-84), regulations specific to certain processing situations (Articles 85-91), delegated and implementing acts (Articles 92-93), and concluding provisions (Articles 94-99).

The regulation is based on six general principles of data protection outlined in Article 5, paragraph 1⁴⁷:

1. a) lawfulness, fairness, and transparency: Personal data must be processed lawfully, fairly, and transparently towards the data subject;
2. b) purpose limitation: they must be collected for specified, explicit, and legitimate purposes and processed in a manner compatible with those purposes; c) data minimization: they must be adequate, relevant, and limited to the purposes for which they are processed;
3. d) accuracy: they must be accurate and up to date;
4. e) storage limitation: they must be stored in a way that allows the data subjects to be identified for the period necessary for achieving the purposes for which they are processed;
5. f) integrity and confidentiality: they must be processed ensuring adequate security.

The adherence to these principles must be embedded in both the design systems of any IT architecture and in general organizational business practices in order to expand focus on the responsibilities of data processors and to highlight the importance of the Guarantor

⁴⁷ Tortora A., "Il nuovo regolamento europeo per la protezione dei dati (GDPR) e la figura del Data Protection Officer (DPO): incidenza sull'attività della pubblica amministrazione." *Amministrativamente-Rivista di ateneo dell'Università degli Studi di Roma "Foro Italico"* 5-6 (2018).

for data protection and its collaboration with independent authorities in other member states.

In the Italian legal system, the Council of State has referred to the regulation in numerous judgments, stating it plays a fundamental role in “containing the risk of discriminatory treatments for individuals that may stem from a blind reliance on the use of algorithms”⁴⁸. Indeed, regarding automated decision-making concerning natural persons (Article 22), the GDPR prohibits the sole use of automated processing during a decision-making process about an individual that produces legal effects concerning them. However, this prohibition can be overridden under certain conditions. Specifically, Article 22, paragraph 1, provides that the automated process does not apply when the decision: a) is necessary for the conclusion or performance of a contract between the data subject and a data controller; b) is authorized by Union or Member State law applicable to the data controller, but that law must provide suitable measures to safeguard the data subject’s rights, freedoms, and legitimate interests; c) is based on the explicit consent of the data subject. Additionally, the data controller has the right to obtain human intervention from the data controller, to express their own opinion, and to contest the decision.

According to some, the GDPR faces challenges in terms of effectiveness in the context of AI regulation. For instance, according to Casey et al., this protection is limited as data subjects should understand and verify the basic functionality of such automated decision-making systems, as well as the logic behind these systems, which is often not feasible due to the phenomenon of the black box. Despite the efforts of the GDPR in Articles 13, 14, 15, and 22, the concept of the "right to explanation" established for automated decision-making systems remains somewhat vague.

Artificial Intelligence Act (AI Act)

The European Union Commission proposed an EU regulatory framework on artificial intelligence on April 21, 2021. Its formal title is the “Regulation Laying down Harmonized Rules on Artificial Intelligence Act” and it represents the first real attempt

⁴⁸ Council of State, Section VI, judgement of February 4, 2020, no.881; Council of State, Section VI, judgements of December 13 2019, no. 8472-8473-8474.

to establish a comprehensive regulation covering various aspects of artificial intelligence.

The main objectives are the following:

- Ensuring the AI systems' safety when placed on the Union market whilst respecting existing fundamental rights and values;
- Providing legal certainty to foster AI innovation and investment;
- Strengthening efficient implementation of current regulations concerning fundamental rights and safety standards that apply to AI systems;
- Promote the creation of a single market for lawful, secure, reliable AI applications.

Such objectives should be achieved with the proposed harmonized risk-based approach.

According to this logic, all AI systems are categorized into those creating unacceptable risk, those creating high risk, and those creating low risk for which the Regulation does not intervene⁴⁹.

The proposal establishes a European Artificial Intelligence Board, composed of representatives of the Member States and the EC, to supervise and facilitate the adoption of these new rules, and to cooperate with the national supervisory authority which must do the same but at the national level.

The Commission proposes that Member States, or the European Data Protector Supervisor, could establish a regulatory sandbox for the development, training, testing, and validation of innovative AI systems before placing those systems on the market (Article 53)⁵⁰. A regulatory sandbox serves as a mechanism that enables enterprises to investigate and trial novel products, services, or ventures with regulatory oversight. This framework offers creators incentives to assess their innovations within a controlled environment, affording regulators to deeper understanding of the technology, and ultimately cultivating consumer options over time. However, the Committee draft report

⁴⁹ For more details:

<https://oeil.secure.europarl.europa.eu/oeil/popups/printficheglobal.pdf?id=725395&l=en>

⁵⁰ The full Article is analyzed here:

<https://www.euaiact.com/article/53#:~:text=National%20competent%20authorities%20may%20establi sh,market%20or%20put%20into%20service.>

on the AI Act of 2022 reported the necessity for those tools to gain more transparency due to their risk of being misused or abused.

One of the biggest limitations of the AI Act is that it revolves around a single area, that of artificial intelligence applications.

However, new directives should be established that also encompass services provided through the use of AI systems. For this reason, it is important to also discuss the Digital Service Act and the Digital Market Act in this context.

Digital Service Act and Digital Market Act

There are two legislative proposals put forward by the European Commission to regulate the digital sector within the European Union. The Digital Services Act (DSA) is aimed at revising and modernizing rules related to the liability of online intermediaries such as social platforms, content-sharing services, cloud services, and search engines. Its goal is to ensure transparency, accountability, and user protection from viewing, purchasing, or interacting with illegal products and content.

The Digital Markets Act (DMA) is intended to establish rules for large digital platforms that wield significant market influence. Its objective, defined within Article 1 of the proposal, is to ensure fair competition conditions in the digital market, thus pursuing a goal entirely focused on competition protection. To prevent potential abuses by dominant platforms, the DMA envisions prohibitions and obligations for gatekeepers through the introduction of ex-ante regulation, i.e., it regulates and defines behaviors and obligations for companies before abuse occurs.

Although there may not be a direct link between the proposals for platform and digital market regulation and AI, platforms extensively utilize artificial intelligence systems for their operations, organization, and provision of activities and services. The DSA does not explicitly reference AI systems, but it is familiar with the topic due to the algorithms embedded in many digital applications, which constitute its main target. The same reasoning applies to the DMA. Gatekeepers typically decide who is authorized to access a network or infrastructure and control the flow of information, relying on big data and sophisticated algorithmic technologies. Thus, once again, AI plays a crucial role in the functioning of these mechanisms.

In these days there has been much discussion about the DSA, as the deadline for platform operators to submit a systemic risk assessment report is set for August 25, 2023. This report entails an analysis that identifies potential inherent hazards within the platforms. Furthermore, in 2024, independent bodies will be established at the national level to handle user complaints. In Italy, the European Commission has designated the Authority for Communications Guarantees (Agcom) for this task.

National Digital Data Platform (PDND)

It is a project by the Department for Digital Transformation of the Presidency of the Council of Ministers and PagoPA S.p.A., provided for in the National Recovery and Resilience Plan (PNRR), and aimed at creating a centralized system for managing, sharing, and accessing public data in Italy. The National Public Data Platform (PDND)⁵¹ seeks to promote the openness of public administration data, enabling citizens, businesses, and other public entities to access, use, and reuse data in a transparent and privacy-compliant manner. The PDND was officially established by the "Simplification Decree" (Legislative Decree No. 76/2020) and subsequently regulated by various legislative acts. The platform has been developed to facilitate data sharing among different public administrations and enhance the accessibility of public data for citizens and businesses.

National Strategy for Artificial Intelligence

It is a strategic plan developed by a country to guide the development, adoption, and responsible use of artificial intelligence (AI) across various sectors, including industry, education, research, and public administration. This strategy aims to outline an overarching vision, key objectives, and specific actions to develop and harness AI in a beneficial manner for the country.

All these regulations and strategies should help Italy and the other Member States invest in new AI projects in order to make those nations compete in the global landscape.

⁵¹ <https://innovazione.gov.it/notizie/articoli/pnrr-al-via-la-piattaforma-digitale-nazionale-dati/>

On a global scale, the public services sector appears to be one of the most receptive to technological innovations, often aimed at facilitating interactions with citizens to address queries and challenges. An example of applying artificial intelligence tools in this realm is represented by Prometea, an initiative launched in Buenos Aires, Argentina in 2017. It constitutes a public assistance service that can be entrusted with the task of processing legal or administrative documents, yielding substantial time-related benefits. Particularly noteworthy is the role this tool plays in the domain of procurement activities as it was estimated to result in a savings of 29 working days in the opening of procurement bids⁵². The digitization of public procurement is a highly discussed topic also in Italy, especially after the new legislative decree No. 36/2023⁵³

By focusing on Italy, other AI systems have been tested, some have failed, and others seem to be working.

For instance, X-Law is a predictive system for predatory crime prevention that has been granted an Italian patent. The industrial invention certificate was issued on October 27, 2022, after several years of experimentation (2013-2019) in security operations offices in Naples, Prato, Salerno, Venice, Modena, and Parma⁵⁴.

Albeit the system is considered a great project to make a valuable contribution to knowledge and progress in combating widespread lawlessness, there are still many concerns about its effective use in police stations.

An Italian case of AI adoption in PA that failed, instead, was the “Buona Scuola” case. The reform of the Buona Scuola envisaged an extraordinary plan for the permanent hiring and mobility of school teachers. To address this situation, the Ministry of Education decided to utilize software provided by an external company to prepare the rankings. However, a malfunction of the algorithm occurred. Numerous teachers, despite their scores, were transferred far away from their place of residence. Following this situation, a series of appeals ensued regarding the algorithm having replaced the decision-making process assigned to an office and an official. The Administrative Court (TAR) deemed these appeals well-founded, and the algorithm ended up substantiating the proceedings

⁵² For further research on this topic: D.U. GALETTA, J.G. CORVALÁN, *Intelligenza artificiale per una Pubblica Amministrazione 4.0? Potenzialità, rischi e sfide della rivoluzione tecnologica in atto*, 2019, in federalismi.it

⁵³ This constitutes the main topic of Chapter 3.

⁵⁴ X-Law is presented here: <https://www.xlaw.it/presentazione/>

itself. However, it was not the methodology chosen during the administrative process that created the issue, but rather the fact that the software was used upstream of the decision-making process. The entire course of the procedure, including its outcome, was entirely delegated to an algorithm, which in its execution had created a discriminatory situation. The TAR declared the use of such a system illegitimate⁵⁵, as "human activity cannot be replaced by the impersonal activity of a machine, since it cannot guarantee the procedural examination that must inform administrative activity, especially where it results in measures affecting the legal subjective positions of private individuals."

⁵⁵ TAR Lazio-Roma, Sez. III-bis 10 settembre 2018, n. 9227

CHAPTER 3: THE CONTRACT AND PUBLIC PROCUREMENT EVALUATION OF AI

THE WHITE PAPERS

Starting from the 20th century, the British government was accustomed to using government documents characterized by a white cover and, for this reason, defined as white papers. At the time they used to contain comprehensive policy proposals and government information.

Over time, their utilization extended beyond the United Kingdom and gained international prominence as a pivotal medium in shaping policy, innovation, and public discourse. For instance, White papers have indeed been used since the 1980s in the modern computer industry⁵⁶.

A white paper, in its essence, is an informative document released by various entities (a company, a not-for-profit organization, or a government body) to promote and elucidate specific solutions, products, or services that it offers or plans to offer.

They are commonly set for marketing purposes between a manufacturer and a wholesaler, or between a wholesaler and a retailer, such as enticing or persuading potential customers to learn about or purchase a particular product, service, technology, or methodology. Nevertheless, unlike brochures, white papers lack a distinct marketing agenda; instead, they offer in-depth information on subjects that are often contentious and unfamiliar, such as emerging technologies.

Indeed, they might also represent technical documents that process a new invention and give clear proof of its functionality by showing data, case studies, and real-world examples. Its concept is often rooted not only in the realms of information dissemination by engaging a targeted audience and encouraging them to explore a topic more deeply, but also in those of governance just like the British Government used to do already in the 1920s. Governments and regulatory bodies use white papers to communicate proposed policies, regulations, or legislative changes. While demonstrating adherence to safety,

⁵⁶ Di Ionos, "Libro bianco: il formato per fare pubblicità attraverso i fatti."

quality, or environmental standards, they can raise awareness about important issues, advocate for change, and mobilize public support.

Given the large number of purposes, it is clear that there exist different types of White Papers. They could be problem-solving, technical, policy, business and marketing, educational, legislative, scientific, and so on.

Nowadays the scope of white papers expanded into the realm of AI, becoming a crucial tool for conveying complex AI policies, principles, and strategies.

In the subsequent sections, it will be explored the key features of the White Paper on AI, and scrutinize its objectives, methodology, and contents.

On March 21, 2018, the Agency for Digital Italy (Agenzia per l'Italia Digitale or AgiD) released the White Paper on Artificial Intelligence at the service of citizens, curated by the task force of the Ministry of Economic Development (MISE) – a group consisting of 30 experts from both public and private sectors on the subject. This paper, aimed to serve as a guide for citizens, is the first real implementation of several government attempts to provide insights into the opportunities offered by artificial intelligence to public administrations- schools, healthcare, facilities, municipalities, courts, and ministries.

The primary objective of the White Paper on AI is to analyze the state of the art of digital services in Italy, also from the perspective of AI development. It is an instrument of soft law⁵⁷ that discusses the various areas where AI is currently being used and where it could instead be exploited by public administrations, and the possible benefits the latter might gain from exploiting automated processes. Hence, the white paper sets out nine challenges, most of them already discussed in the previous chapter, which are addressed in the central part of the document:

- **Ethics: here the anthropocentric principle is affirmed, stating that AI must be placed in the service of humanity and must respect the rights**

⁵⁷ Also defined as “pre-law”, refers to a set of non-binding, informal, or quasi-legal rules, principles, guidelines, or codes of conduct that do not have the same legal force as traditional ‘hard law’ or formal legal statutes and regulations. In the face of new challenges and opportunities presented by technological advancements and in light of a regulatory framework that often proves inadequate, the adoption of guidelines or self-regulation codes for the Internet is often considered desirable. These guidelines and codes are not devoid of political, social, and to some extent, legal value. In the context of AI, this document pertains to a sector that is yet to be fully developed and, therefore, needs to be tested in its practical implications. It fits within a regulatory context that is still in the process of being defined.

and freedoms of citizens, as well as ethical principles such as algorithm transparency, data neutrality, and others.

- Technology: presents possible adoptions of AI in specific sectors and within particular technologies in order to provide better services and infrastructures, and to provide a better quality of life for citizens.
- Skills: this section emphasizes the need to educate both private and public entities to ensure them greater digital literacy. This phenomenon is important in order to equip organizations to navigate the AI landscape effectively, safely, and responsibly.
- Role of Data: focuses on the protection of data, which forms the essence of algorithms. AI solutions are precisely based on the exploitation of a vast amount of data, many of which fall into the category of personal data. Therefore, the need to ensure data protection is as essential as data consistency and quality.
- Legal Framework: outlines the legal regulations for the proper use of AI systems, such as the adherence to ethical principles or the responsibility that falls upon the public administration when using automated decisions. For instance, the need to adhere to the principle of transparency, which applies not only to data but also to algorithms, the logic behind database construction, and the functioning process of the service, is central to the activities of public administration. Furthermore, the Public Administration should adopt criteria in line with the current legal framework, allowing it to: justify decisions even when they are generated by AI systems; ensure the right of access for individuals concerned; and inform those responsible for administrative procedures about the processing methods used by AI

systems. Additionally, there is a need to predefine legal responsibility and have the ability to trace back to human intervention.

- Guiding Transformation: reveals the potential AI has to drive transformative improvements, enhancing the overall quality of life. These new technologies open up significant opportunities for advancements in education, healthcare, and disability support, offering the promise of substantial progress in these vital domains.
- Preventing Inequalities: the legal framework and guidance on AI systems are necessary in order to prevent possible inequalities that might come from the algorithm's biases.
- Measuring Impact: highlights the importance of analyzing the consequences of the AI systems implementation in PA and evaluating its impact.
- Human Beings: this section is strictly related to the first one. It is therefore concerned with placing the individual and the ethical dimension related to the use of such technologies at the forefront. Additionally, it underscores the importance of making citizens aware of the implications of AI-based technologies.

A series of recommendations and suggestions are then drawn up for administrations to make the most of the potential of AI.

However, the main issue remains the same, which is the inadequacy of the current regulatory framework. There is a need to ensure greater support for the work of the legislator, greater oversight of the consequences of the rules that are approved, and greater coordination of the system⁵⁸.

⁵⁸ Dimt, "Il Libro Bianco curato dalla Task Force IA del MISE, la Strategia Nazionale per l'intelligenza artificiale. Intervista al Prof. Avv. Eugenio Prosperetti."

While this White Paper was created to provide information and guidance to Italian citizens on artificial intelligence and its implications, in February 2020, at the request of the Chairman of the European Commission, Ursula von der Leyen, another White Paper on AI was also published. This is an official policy document of the EU intended to provide a strategy and a policy framework for AI, this time at the European level. Its main objectives are to establish Europe as a global leader in artificial intelligence, to promote trust in AI systems, to emphasize the need for AI systems to be transparent, ethical, and accountable, and to introduce the risk-based approach to AI regulation, where high-risk AI applications would be subject to stricter rules⁵⁹, and to promote cooperation among EU member states and stakeholders in AI development, research, and policy-making⁶⁰.

LEGISLATIVE DECREE N. 36/2023

In the final chapter of this thesis, we delve into an innovative development within the Italian legal and technological landscape - Legislative Decree No. 36 of 2023. Published in the Official Gazette on March 31, 2023, this decree marks an absolute novelty: the introduction of a provision expressly dedicated to Artificial Intelligence in the world of public procurement. Its emergence is timely, reflecting the ever-evolving nature of our society in an age where technology and innovation are driving transformative changes. As we embark on an exploration of this legislative milestone, we are confronted with a dynamic intersection of law, technology, and societal progress.

Everything originates from the National Recovery and Resilience Plan (PNRR)⁶¹, which includes a package of investments and reforms structured into six missions:

1. Digitalization, Innovation, Competitiveness, Culture, and Tourism;
2. Green Revolution and Ecological Transition;
3. Infrastructure for Sustainable Mobility;
4. Education and Research;

⁵⁹ The risk-based approach has already been discussed in Chapter 2.

⁶⁰ For more details see: Ulicane, Inga. Chapter 14 Artificial Intelligence in the European Union: Policy, Ethics and Regulation, 2022.

⁶¹ See: <https://www.mimit.gov.it/it/pnrr/piano>

5. Cohesion and Inclusion;
6. Health.

The plan encompasses various reforms, including the “Recovery Procurement Platform”, and the Public Procurement Code. The Recovery Procurement Platform, whose aim is to modernize the national public procurement system, includes an intensive program of information, training, and mentoring carried out by specialized personnel in the management of digital procurement procedures and the use of advanced purchasing and negotiation tools. In particular, the planned activities include, among others: training sessions at various levels; specialized mentoring to guide public administrations in acquiring the technical/functional skills necessary for using the e-procurement platform and digitizing procurement procedures; production of operational guides, demonstrative videos, and other support materials on the main activities to be carried out on the platform. This reform should be implemented by the second semester of 2026.

To enable the implementation of the reforms contained in the PNRR, specific deadlines were set, and failure to meet them results in the loss of European funding linked to the Plan.

In 2022, Parliament approved Law No. 78/2022, delegating the Government to issue a legislative decree containing the reform of the procurement code. The Council of State was then able to draft a Legislative Decree which was subsequently approved by the Council of Ministers on 16/12/2022. The new Italian Public Contract Code was then approved on 28/03/2023, with applicability from July 1st, 2023. The code was adopted with the Legislative Decree 31 of March 2023, n.36, which replaced the previous Legislative Decree 50/2016.

The new Procurement Code does not represent truly innovative legislation as the European legislative framework remains unchanged, still following the 2014 regulations⁶²; rather, it is a codification of pre-existing principles. Firstly, the Code opens with Book I (art.1-47), which already in its title contains a reference to

⁶² Direttiva 2014/23/Ue del parlamento europeo e del consiglio, del 26 ... (n.d.-b). <https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:32014L0023>

Direttiva 2014/24/Ue del Parlamento Europeo e del Consiglio del 26 ... (n.d.-c). <https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:32014L0024>

Direttiva 2014/25/Ue del Parlamento Europeo e del Consiglio del 26 ... <https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:32014L0025>

digitalization ('Of principles, digitalization, planning, and design'). Then there is Book II (art. 48-140) which continues with the part dedicated to contracting in all its phases, Book III (141-173), dedicated to public procurement in the utilities sectors, Book IV (art. 174-208), expressing rules that concern the public/private partnership and concession sectors, and Book V (art.2019-229), that refers to remedies and final provisions.

Of particular interest is Part II of First Book, dedicated to the 'digitalization of the contract lifecycle,' which encompasses all activities related to tender procedures, including those leading to the conclusion of the contract and which, quoting the report dedicated to the text by the Council of State, “represents the true great challenge of the coming years to modernize the reform of the socio-economic system and, therefore, be ready to create and use the new source of wealth and knowledge represented by 'data'”⁶³. In this part of the decree, the theme of AI is further elaborated upon, with Article 19, and subsequently, Article 30, emphasizing the need to prefer automated procedures where possible. For the first time, although only in the field of public contracts, regulatory principles are identified to be followed in the case of using automated procedures.

Article 30 is divided into five paragraphs. The first paragraph states that 'to improve efficiency, contracting stations, and entities should automate their activities using technological solutions, including artificial intelligence and distributed ledger technologies.' However, during this process, source code, documentation, and any other elements necessary to understand its logic of operation are required, as stated in paragraph 2a. Additionally, the tendering documents must contain 'clauses aimed at ensuring the provision of assistance and maintenance necessary to correct errors and unwanted effects resulting from automation' (paragraph 2b)." The third paragraph deals with the four most important principles to adhere to in the field of technology, which are the principles of:

- Knowability and Comprehensibility: “Every economic operator has the right to know the existence of automated decision-making processes that concern them and, in such cases, to receive meaningful information about the logic used." Therefore, firstly, public authorities must inform economic operators when they

⁶³ Teme 1-2/2023. issuu. (n.d.). <https://issuu.com/edicomsrl/docs/teme-01-02-23?fr=sMDJiZiE2MzQyMzQ>

are subject to automated procedures. This obligation should be then accompanied by the need to understand the logic used by automated procedures, although this is not always feasible. Hence, the idea is that all activities must be traceable and attributable to an initial identification number assigned to each procedure, initiated with the Unique Project Code (CUP) and the Tender Identification Code (CIG).

- Non-exclusivity: In the decision-making process, it is essential to ensure the presence of a human element capable of overseeing, validating, or negating the automated decision. This concept gives rise to what is known as 'human-in-the-loop' (HITL), where human intervention occurs within the decision-making process. Traditionally, there are two variants of this approach: 'ex-ante' HITL and 'ex-post' HITL. In the former case, a human collaborates with the automated system from the outset, before the decision is made. In the latter case, human intervention occurs only after the decision has been made, specifically when requested by the recipient of the decision. The difference between these two variants is significant, both in terms of required resources (implementing 'ex-ante' HITL is more resource-intensive) and, more importantly, in terms of the level of autonomy of the automated systems. In the case of 'ex-post' control, automation prevails, conducting the procedure in the absence of human supervision.
- Non-discrimination: translating into the principle of impartiality of public administration, it incorporates precautionary techniques against discriminatory effects towards economic operators. It becomes even more complicated when we talk about machine learning algorithms, which, unlike traditional ones, are not a direct expression of the developer's intent quite often. In this regard, there is a concept known as "Garbage In Garbage Out (GIGO)," explaining that machine learning algorithms feed on one specific thing, data. Therefore, it is essential to ensure the quality of this data.

The fourth paragraph then states the obligation to correct factors that result in inaccuracies in the data, in order to minimize errors and potential forms of discrimination of any kind, those based on nationality, ethnic origin, political opinions, religion, personal beliefs, union membership, physical characteristics, genetic status, health status, gender, or sexual orientation. Lastly, the fifth paragraph requires public administrations to publish the

technological solutions used on their institutional website within the “Transparent Administration” section.

The digital lifecycle of an individual procurement (dealt with within Article 21) takes place through the stages outlined in the regulations. These phases include planning, regarding the context in which the procedure is initiated; design, which involves the creation of the tender documentation; publication, which allows the public to learn about the initiation of the procedure and allows potential stakeholders to participate; award, regardless of the type of procedure used, which culminates in the selection of the entity with which the contract will be signed; and finally, the contract execution phase.

This provision is designed to regulate future developments in the realm of tender procedures. Currently, mainly non-learning algorithms are used. However, with the availability of vast quantities of data, the potential to train machine learning algorithms for application in more complex tender procedures exists. This underscores the importance of creating a framework that adheres to principles intended to govern such utilization. Article 30 holds particular significance for the government within the European context. It addresses both established principles for artificial intelligence solutions and those articulated by administrative judges, which have established guidelines for contracting authorities. In fact, the new code seeks to promote increased independence and accountability among contracting authorities, empowering them with more autonomy and discretion, both administratively and technically. In a field where strict and intricate regulations have frequently led to uncertainties, delays, and inefficiencies, the code aims to provide greater freedom for initiative.

Its implementation requires executive regulatory acts to be submitted to ANAC for the definition of information and data to be included in the national database, as well as the determination of integration timelines for e-procurement platforms. Additionally, AGID oversees the technical requirements of e-procurement platforms. Furthermore, the digitalization of public contracts can only be achieved with efficient technological tools, enhanced personnel training, considering the varying levels of expertise among the involved parties, and process reengineering.

Overall, the problem preventing the full efficiency of this law lies in the difficulty of obtaining practical results from the data used for procurement management purposes. This becomes evident through the inconsistencies found in the analysis of the national

database of public contracts: there are discrepancies between the value of individual lots and the value of the tender, between the awarded value and the announced value, lack of data updates, and a significant number of missing values, as nearly 48% of observations lack information about the municipality where the contract takes place. In addition, there are discrepancies in the reported dates.⁶⁴ To ensure that this new code functions correctly, it is necessary for administrations to foster a genuine data-driven culture.

As already expressed in the previous chapters artificial intelligence (AI) relies on training data for machine learning processes, which form the foundation for the AI's operational boundaries and decision-making logic. Various machine learning and deep learning technologies aim to make AI systems capable of understanding the correlations between input data and expected outputs. However, challenges arise in training AI systems to handle diverse data types, and legal limitations may affect data labeling.

One common issue in AI training is the potential for bias to emerge in the model's decision-making. For instance, AI systems used in predictive policing have exhibited biases, such as favoring certain neighborhoods or ethnic groups, due to biases in the training data. This is known as "overfitting," where the model becomes overly aligned with the training data, leading to biased outcomes.

Additionally, data poisoning attacks can alter the AI model's behavior by introducing data designed to manipulate its decisions. The indiscriminate use of personal data in AI training poses privacy and intellectual property concerns.

Furthermore, there's a growing trend toward synthetic data, which is generated algorithmically to replicate real data correlations without specific individual references. However, challenges remain in ensuring the transparency and accountability of AI models trained on synthetic data.

In conclusion, the use of training data is crucial in AI development, but it poses challenges related to bias, data quality, and legal considerations. Emerging solutions like synthetic data aim to address some of these issues, but accountability and transparency remain key concerns in AI deployment by public administrations.

⁶⁴ Cusumano, N. (2023, August 4). Appalti Pubblici: Se Manca la cultura del dato non c'è salto di qualità. Agenda Digitale. <https://www.agendadigitale.eu/procurement/appalti-pubblici-se-manca-la-cultura-del-dato-non-ce-salto-di-qualita/>

Although this reform contains very ambitious and revolutionary elements, signing a new era of public procedures focused on digitalization, simplification, and acceleration, there are still doubts about its effectiveness in the field. Despite extensive discussions about monitoring tools, it remains challenging to witness an improvement in their quality and full compliance, especially until administrations and individual project or contract managers start receiving informative feedback and making use of the collected and submitted data.

CONCLUSIONS

In conclusion, this thesis has explored the multifaceted landscape of artificial intelligence (AI) in the context of administrative decision-making, with a particular focus on Italy. We have examined the opportunities and risks associated with AI, including the challenges of black-box algorithms and biases stemming from inadequate training data. By analyzing the norms and regulations governing AI applications in the Italian public sector, the advancements of AI in different Italian sectors, and its potential benefits, it becomes evident the need for more effective regulatory frameworks, that should, in addition, be able to take into account the autonomy of these machine learning systems. Indeed, the last chapter has provided an in-depth exploration of two significant aspects of AI in the Italian context. First, we discussed the importance of white papers as a tool for disseminating AI policies, principles, and strategies. The examination of the White Paper on AI by the Agency for Digital Italy shed light on its objectives, including ethics, technology, skills, data, legal framework, transformation, preventing inequalities, measuring impact, and the role of human beings. These objectives highlight the critical considerations when implementing AI in public administration. The latter part of Chapter 3 introduced Legislative Decree No. 36 of 2023, a groundbreaking development in Italy's legal and technological landscape. This decree emphasizes the digitalization of public procurement and the integration of AI. The legislation encourages the use of automated procedures, emphasizes human oversight, promotes non-discrimination, and requires transparency in AI applications within public procurement. However, the effectiveness of this legislative reform remains a subject of debate, especially concerning data quality and the practical implementation of AI-driven processes in public administration. The success of this reform hinges on a genuine data-driven culture and ongoing efforts to ensure accountability and transparency in AI applications. In summary, the path forward requires continued vigilance in addressing biases, ensuring transparency, and fostering a culture of responsible AI use within the public sector, as well as ongoing research, policy development, and adaptation to new technologies.

BIBLIOGRAPHY

Agenzia per l'Italia digitale. (2018, March 21). *L'intelligenza artificiale Al Servizio del Cittadino: Sfide E opportunità*.

<https://www.agid.gov.it/index.php/it/agenzia/stampa-e-comunicazione/notizie/2018/03/21/lintelligenza-artificiale-al-servizio-del-cittadino-sfide-opportunita>

Algoritmi Nelle PA: Il tar Lazio torna a pronunciarsi. Romagna. (n.d.).

<https://poloarchivistico.regione.emilia-romagna.it/notizie/algoritmi-nelle-pa-il-tar-lazio-torna-a-pronunciarsi#:~:text=Con%20la%20sentenza%20n%C2%B0,2018%20e%20n%C2%B0%206606%2F2019>.

Amoore, Louise, and Rita Raley. "Securing with Algorithms: Knowledge, Decision, Sovereignty." *Security Dialogue* 48, no. 1 (December 12, 2016): 3–10.
<https://doi.org/10.1177/0967010616680753>.

Appalti Pubblici: Se Manca la cultura del dato non c'è salto di qualità. Agenda Digitale. (2023, August 4). <https://www.agendadigitale.eu/procurement/appalti-pubblici-se-manca-la-cultura-del-dato-non-ce-salto-di-qualita/>

Artificial Intelligence Act - datocms-assets.com. (n.d.-a). <https://www.datocms-assets.com/43475/1686644974-ai-act.pdf>

Artificial Intelligence Act and regulatory sandboxes: Think tank: European parliament. Think Tank | European Parliament. (n.d.).
[https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI\(2022\)733544](https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2022)733544)

Bello, F. P. (2022, March 3). *Il pnrr e l'eterno cantiere dei contratti pubblici: Intelligenza artificiale, digitalizzazione E Appalti Pubblici*. NT+ Diritto.
<https://ntplusdiritto.ilsole24ore.com/art/il-pnrr-e-eterno-cantiere-contratti-pubblici-intelligenza-artificiale-digitalizzazione-e-appalti-pubblici-AExcXbHB>

Bocchi, C., & Olivi, G. (2020, April 15). *The EU White Paper on Artificial Intelligence: The Five Requirements*. Dentons.

<https://www.dentons.com/en/insights/articles/2020/april/15/the-eu-white-paper-on-artificial-intelligence-the-five-requirements>

Bond, R. (2023, February 1). *Teme 1-2/2023*. issuu.

<https://issuu.com/edicomsrl/docs/teme-01-02-23?fr=sMDJiZjE2MzQyMzQ>

Chiti, Edoardo, Barbara Marchetti, and Nicoletta Rangone. “L’impiego Di Sistemi Di Intelligenza Artificiale Nelle Pubbliche Amministrazioni Italiane: Prove Generali.” *BioLaw Journal - Rivista di BioDiritto*. Accessed August 5, 2023.

<https://teseo.unitn.it/biolaw/article/view/2351>.

Codice Amministrazione Digitale. Agenzia per l’Italia digitale. (n.d.).

<https://www.agid.gov.it/it/agenzia/strategia-quadro-normativo/codice-amministrazione-digitale>

Cusumano, N. (2023, August 4). *Appalti Pubblici: Se Manca la cultura del dato non c’è salto di qualità*. Agenda Digitale.

<https://www.agendadigitale.eu/procurement/appalti-pubblici-se-manca-la-cultura-del-dato-non-ce-salto-di-qualita/>

D.lgs. N. 36/2023 (Cod. Contr.) - bosetti gatti & partners s.r.l. (n.d.-d).

https://www.bosettiegatti.eu/info/norme/statali/2023_0036.htm

D.U. GALETTA, J.G. CORVALÁN, *Intelligenza artificiale per una Pubblica Amministrazione 4.0? Potenzialità, rischi e sfide della rivoluzione tecnologica in atto*, 2019, in federalismi.it

Decisione Amministrativa Robotica Ed Effetto Performativo. un beffardo algoritmo per Una “buona scuola.” *Decisione amministrativa robotica ed effetto performativo. Un beffardo algoritmo per una “buona scuola.”* (n.d.).

https://www.questionegiustizia.it/articolo/decisione-amministrativa-robotica-ed-effetto-performativo-un-beffardo-algoritmo-per-una-buona-scuola_13-01-2020.php

Di Ionos, La Redazione. “Libro bianco: il formato per fare pubblicità attraverso i fatti.” IONOS Digital Guide, July 31, 2018. <https://www.ionos.it/digitalguide/online-marketing/vendere-online/scrivere-un-white-paper/#:~:text=I%20white%20paper%20sono%20stati,di%20legge%20con%20copertina%20blu.>

Die europäische kommission. Accessed August 5, 2023.

https://ec.europa.eu/futurium/en/system/files/ged/ai_hleg_definition_of_ai_18_deember_1.pdf.

Dimt, Redazione. “Il Libro Bianco curato dalla Task Force IA del MISE, la Strategia Nazionale per l’intelligenza artificiale. Intervista al Prof. Avv. Eugenio Prosperetti.” *Diritto Mercato Tecnologia*, October 23, 2020. <https://www.dimt.it/news/il-libro-bianco-curato-dalla-task-force-ia-del-mise-la-strategia-nazionale-per-lintelligenza-artificiale-intervista-al-prof-avv-eugenio-prosperetti/>.

Domenico Mosco, Gian. “Ai and the Board within Italian Corporate Law: Preliminary Notes.” *European Company Law* 17, no. Issue 3 (2020): 87–96. <https://doi.org/10.54648/eucl2020014>.

Elaborata dal Gruppo di Esperti Mise sull’intelligenza artificiale ... (n.d.-a). https://www.mimit.gov.it/images/stories/documenti/Proposte_per_una_Strategia_italiana_AI.pdf

European Commission. (2020, February 19). White Paper on Artificial Intelligence - European Commission. https://commission.europa.eu/system/files/2020-02/commission-white-paper-artificial-intelligence-feb2020_en.pdf

Faini, Fernanda. “Intelligenza Artificiale e Diritto: Le Sfide Giuridiche in Ambito Pubblico.” *Intelligenza artificiale e diritto: le sfide giuridiche in ambito pubblico*, in *BioLaw Journal – Rivista di BioDiritto*, n. 1, pp. 145-162 (ISSN 2284-4503), January 1, 2019.
https://www.academia.edu/67503203/Intelligenza_artificiale_e_diritto_le_sfide_giuridiche_in_ambito_pubblico.

“Feroni (GPDP): ‘IA nei processi decisionali della PA, il faro è la Costituzione’ - Intervento di Ginevra Cerrina Feroni,” n.d.
<https://www.garanteprivacy.it/home/docweb/-/docweb-display/docweb/9892588>.

Fidanza, F. (2023, March 8). *L'intelligenza artificiale Nel Nuovo Codice dei contratti*. FARE online. <https://www.fareonline.it/primo-piano/lintelligenza-artificiale-nel-nuovo-codice-dei-contratti/>

“Guarda Intelligenza artificiale e diritto: le sfide giuridiche in ambito pubblico,” n.d.
<https://teseo.unitn.it/biolaw/article/view/1348/1350>.

“Guarda L'impiego di sistemi di intelligenza artificiale nelle pubbliche amministrazioni italiane: prove generali,” n.d.
<https://teseo.unitn.it/biolaw/article/view/2351/2296>.

Helberger, N., & Diakopoulos, N. (2023, February 16). *Chatgpt and the AI act*. Internet Policy Review. <https://policyreview.info/essay/chatgpt-and-ai-act>

Hayes, A. (2023, May 24). *What is a white paper? types, purpose, and how to write one*. Investopedia.
<https://www.investopedia.com/terms/w/whitepaper.asp#:~:text=A%20white%20paper%20is%20an,offers%20or%20plans%20to%20offer>.

Il caso Snowden e Le Conseguenze Diplomatiche del Datagate in “Atlante Geopolitico.” in “Atlante Geopolitico.” (n.d.).

https://www.treccani.it/enciclopedia/il-caso-snowden-e-le-conseguenze-diplomatiche-del-datagate_%28Atlante-Geopolitico%29/

“Il Mercato Italiano Dell’intelligenza Artificiale Esplode: 500 Milioni Di Ricavi, Il +32% Sull’anno Scorso, e Oltre 6 Grandi Imprese Su 10 Hanno Già Avviato Almeno Un Progetto Di Ai.” YM!, February 2, 2023. <https://youmark.it/ym-interactive/il-mercato-italiano-dellintelligenza-artificiale-esplode-500-milioni-di-ricavi-il-32-sullanno-scorso-e-oltre-6-grandi-imprese-su-10-hanno-gia-avviato-almeno-un-progetto-di-ai/>.

Intelligenza artificiale per una pubblica amministrazione 4.0 ... (n.d.-b).

<https://air.unimi.it/bitstream/2434/623522/5/GalettaCorvalanDecisioneAlgoritmica2019OpenAccess.pdf>

“Intelligenza Artificiale: il mercato italiano cresce del 32%,” n.d.

<https://www.osservatori.net/it/ricerche/comunicati-stampa/intelligenza-artificiale-crescita-chatgpt>.

Intelligenza artificiale: L’Italia Lancia La Strategia Nazionale. Ministero

dell’Università e della Ricerca. (n.d.). <https://www.mur.gov.it/it/news/giovedi-25112021/intelligenza-artificiale-litalia-lancia-la-strategia-nazionale>

Italia, A.-A. G. (n.d.). *Come è andata a finire la storia dell’algoritmo Impazzito del Miur*. Agi. https://www.agi.it/cronaca/algoritmo_miur_assegnazioni_insegnanti-1896615/news/2017-06-20/

Iurascu, A. (2023, April 6). *The new Italian public contract code: Setbacks, Innovation, and new SPP requirements.* SAPIENS Network. <https://sapiensnetwork.eu/new-italian-public-contract-code-setbacks-innovation->

McKinsey Global Institute. "Reviving Innovation in Europe: McKinsey Global Institute Innovation in Europe Discussion Paper." October 2019. Accessed August 31, 2023. <https://www.mckinsey.com/~media/mckinsey/featured%20insights/innovation/reviving%20innovation%20in%20europe/mgi-innovation-in-europe-discussion-paper-oct2019-vf.ashx>.

Morelli, C. (2023, April 17). *Appalti Pubblici con L'intelligenza Artificiale. Codici sorgenti trasparenti. In archivio i pdf: contratti solo digitali*. Altalex. <https://www.altalex.com/documents/news/2022/11/07/x-law-brevetto-italiano-polizia-predittiva>

Napoli, F. (2020). "Algoritmi, Intelligenza artificiale e formazione della volontà pubblica: la decisione amministrativa e quella giudiziaria". *Rivista N. 3/2020*
URL
https://iris.uniroma1.it/bitstream/11573/1651366/1/Napoli_Algoritmi_2020.pdf.pdf

Nicotra, A., & Varone, V. (n.d.). *L'ALGORITMO, INTELLIGENTE Ma non troppo.***
- sipotra.it. <https://www.sipotra.it/wp-content/uploads/2019/12/L%E2%80%99ALGORITMO-INTELLIGENTE-MA-NON-TROPPO.pdf>

Pajno, Alessandro, Filippo Donati, and Antonio Perrucci. *Intelligenza artificiale e diritto: Una rivoluzione?* Bologna: Società Editrice il Mulino, 2022.

(PDF) AI, Algoritmi e Pubblica Amministrazione in Italia - researchgate. (n.d.-c). https://www.researchgate.net/publication/339633400_AI_algoritmi_e_pubblica_amministrazione_in_Italia

Pinotti, G. (n.d.-a). *Amministrazione Digitale Algoritmica e Garanzie Procedimentali*. Labour & Law Issues. <https://labourlaw.unibo.it/article/view/13175>

PNRR E appalti pubblici: La Riforma Recovery Procurement Platform. Digital4. (2021, September 9). <https://www.digital4.biz/procurement/acquisti-pa/pnrr-e-appalti-pubblici-il-ruolo-del-digitale-e-la-riforma-recovery-procurement-platform/>

Prosperetti, Eugenio. "Dati di Addestramento, Intelligenza Artificiale e Pubblica Amministrazione."

Rigucci, L. (2023, April 17). *Intelligenza artificiale Nei settori Pubblici – da un Quadro Normativo Europeo alla Disciplina Nazionale*. Studio Legale Fidanzia Gigliola. <https://www.fidanziagigliola.it/intelligenza-artificiale-nei-settori-pubblici-da-un-quadro-normativo-europeo-alla-disciplina-nazionale/>

Saurwein, F., Just, N., & Latzer, M. (2015, September 14). *Governance of algorithms: Options and limitations*. info. <https://www.emerald.com/insight/content/doi/10.1108/info-05-2015-0025/full/html>

Scorza, F. (2023, May 5). *Appalti Pubblici Ed intelligenza artificiale - blog*. Martino & Partners. <https://www.martinopartners.com/blog/lart-30-nel-nuovo-codice-appalti-utilizzo-dellia-nelle-procedure-di-appalto/>

Saurwein, F., Just, N., & Latzer, M. (2015, September 14). *Governance of algorithms: Options and limitations*. info. <https://www.emerald.com/insight/content/doi/10.1108/info-05-2015-0025/full/html>

Stefano Da Empoli. *Intelligenza artificiale: ultima chiamata: il Sistema italiano alla prova del futuro*, 2019.

The Black Box Society - UC santa barbara. Accessed August 5, 2023.

<https://raley.english.ucsb.edu/wp-content/Engl800/Pasquale-blackbox.pdf>.

“The Economics of Algorithmic Selection on the Internet.” *ResearchGate*, October 21, 2014. <https://doi.org/10.5167/uzh-100400>.

Troppi contenuti Dannosi, Entra in Vigore IL Digital Services Act. euronews. (n.d).
<https://it.euronews.com/my-europe/2023/08/25/entra-in-vigore-il-digital-services-act-la-stretta-online-sui-contenuti-dannosi-in-europa#:~:text=Entra%20in%20vigore%20questo%20venerd%C3%AC,dei%20contenuti%20nel%20mondo%20digitale>.

Ulnicane, Inga. “Artificial Intelligence in the European Union.” In Routledge EBooks, 254–69, 2022. <https://doi.org/10.4324/9780429262081-19>.

Vantin, Serena. *Il diritto antidiscriminatorio nell’era digitale: Potenzialità e Rischi per le persone, La Pubblica Amministrazione, le imprese.* Milano: Wolters Kluwer, 2021.

Yeung, Karen, and Martin Lodge. *Algorithmic regulation.* Oxford University Press, 2019.

Zorloni, L. (2023, August 24). *La Prova del Nove del DSA, il piano dell’europa per dominare sulle big tech.* Wired Italia. <https://www.wired.it/article/dsa-digital-services-act-piattaforme-regole-scadenza-controlli/>