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# Regulating to innovate - how AgID is shaping Italy's digital future in the context of the EU's Digital Decade

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# INTRODUCTION

It is a fact of today's world that we live in a digital era, one that has profoundly changed the way humans live, in a manner not dissimilar that the invention of the steam engine had on the societies of the 19th century.

Indeed, the creation of the World Wide Web in the early 90s, bundled together with the spread of personal computers then, and smartphones now, has ensured the start of an all-encompassing revolution, which range from finance, with the rise of the so-called fintech, to entertainment, where streaming has usurped cable as the primary mean to consume movies and television series since 2022 (Nielsen, 2022).

But it isn't just the private sphere that is interested in the possibilities of digital technologies and, in fact, it wasn't the private that was the first to actively utilize said technologies, but rather public administrations, with ARPA's (now DARPA, Defence Advanced Project Agency) ARPANET and the National Physics Laboratory NPL network being the precursors to today's WWW. And yet, despite their role as pioneers of the technologies of the future, nowadays most governments, especially in Europe, struggle to interface effectively with them, primarily due to years of privatizations and of austerity that significantly stifled their capabilities.

To further complicate things, the lack of faith that the general public has had toward governmental institutions has led to a distrust in their ability to be "innovative" and "groundbreaking" like the private sector has been purported to be by mainstream neoliberal thinking. Among public organizations, this distrust couldn't be more felt among regulatory agencies and, more generally, toward attempts to regulate digital technologies, which is often seen as an unjust stifling

of innovation from bureaucrats who are ignorant of the technologies they are regulating.

In the last few years, however, the wind have been changing; now, with a renewed call for governments to invest into digital technologies, spurred in large part from the Covid-19 pandemic and the funds from the NextGen EU plan, European governments have been called upon to rebuild these long-lost capabilities, not only informatically, but also on a regulatory level. The incapability to effectively manage the implementation of digital technologies through the fabric of society has significant consequences on the wellbeing of its citizens.

Consider, for example, the rise of the gig economy, which originated from the lack of clarity regarding the role that workers employed by apps such as Uber or Deliveroo have within said organizations; or, better yet, consider how social medias went from a place of connection and enabler of great changes, like the 2010s Arab Springs, to one where misinformation and disinformation runs rampant, and which has consistently trampled over the privacy of it's own users, sometimes for sinister purposes, with the most infamous case being the Cambridge Analytica scandal, where 87 million people where profiled without their consent, their data then being used to subtly manipulate public perception on topics such as the 2016 US elections, or Brexit in the UK. In other words, a regulatory agency which isn't able to sufficiently keep pace with the technological innovations of our time may find itself swept up by them, and thus unable to effectively protect either individuals or organizations alike from the risks caused by the unregulated use of these technologies.

This may well be the case with the latest "fad" within digital spaces, that being the latest round of Artificial Intelligence products and services. Their staggering

development since their introduction in 2022 (2 years ago, as of the time of this writing) have been a cause for both hope and concern, as they promise to upheaval many of the foundations our society is built on, from the way we interact with it to even the way we work.

Through this paper, I intend to scrutinize the notion that a regulatory organization is merely a hinderer to innovation, but rather, through focused policymaking, it can in fact become an enabler for groundbreaking revolutions, while at the same time preserving fundamental rights such as privacy, freedom of expression and other, equally important, aspects of human dignity.

In particular, I will explore the relationship between international and national regulators, so as to understand how large-scale initiatives end up being interpreted by individual members of such organizations. The case study I have chosen to better investigate this relationship is the recent introduction by the European Union of Regulation 2024/1689, better known as the "AI Act", which entered in force recently, and whose purpose (as the name would imply) is the regulation of Artificial Intelligence application and services within the union; as for the nation regulatory agency which will be examined, I have decided upon AgID, which has already released guidelines based on the AI Act and, as such, I believe it will provide a good approach to analyze how a soft and hard laws created by an international institution end up being interpreted and (more importantly) implemented by a nation such as Italy.

The thesis would thus be structured in the following manner; Chapter 1 will cover digitalization within the context of public organizations and the European Union, then moving on to explaining the growth of the AI sector within the last years and how the EU intends to regulate it through the AI Act. Chapter 2 will then discuss the "state of the art" surrounding Italy, focusing in particular on his issues

in interfacing with digitalization, and explaining in which manner AgID is attempting to course correct, particularly within the public context. Moving on, Chapter 3 will begin examining AgID strategic plan surrounding AI, starting from the objectives it aims to accomplish and the principles that guide it, to then move on and examine the way it is structured. Chapter 4 will then look deeper into the strategy, by examining the macro areas that where identified as crucial for the success of the plan, focusing in particular on each strategic enabling action to assess whether they are fit for purpose. Finally, Chapter 5 will be used to compare AgID' strategic plan to two other plans surrounding AI from Germany and France, before giving out the conclusions on the thesis itself.

# CHAPTER 1

## 1.1 The importance of digitalization for public administration

Digitalization can be understood as a transformative process brought by (as the name would imply) digital technologies. In particular, three "vectors of change" are usually highlighted by researchers of the field (Eurofound), those being automation, the replacement of labor input by machine input; digitization, defined as the translation of physical media into digital one (or the reverse), usually done through the use of sensing devices or similar instruments; and, finally, coordination through platforms, which is the use of digital platforms to provide services and allow for faster transactions, and is usually done through the use of algorithms.

In a world that has become increasingly digital for the last 30 years, the successful implementation of such technologies has been proven to provide a variety of benefits to its users; For example, a recent joint research by the IMF and the OECD showed a stark difference in productivity loss between highly-digitalized sectors and lesser digitalized ones in a pandemic scenario (such as the Covid-19 pandemic), with the former being far less impacted than the latter. (Jaumotte, et al., 2023)

Nowhere is this process more important than in the public administration sector, where public agencies of all shapes and forms operate within a complex network of stakeholders to provide services necessary for the smooth function of modern society; as such, digitalization initiatives (such as the creation of a national health directory) become a key driver to simplify and improve on these services, which in turn generate a positive downstream effect on the various stakeholders that make use of them.

However, managing digitalization initiatives is not an easy task, not only for the complexity of the technology itself, but also for the need to coordinate multiple potential actors, who may be indifferent or outright hostile to projects which could disrupt their established operations.
In particular, Di Giulio and Vecchi highlighted how the degree of interaction between such actors wasn't just an inter-organizational affair, but also an intra-organizational one, with the degree of interactions significantly affecting the type of governance required to effectively implement a digitalization initiative (Di Giulio & Vecchi, 2023).

Their research also highlights an issue of governance within the public sector. For the last thirty years, the name of the game has been New Public Management (NPM), and in particular a development of it created by David Osborne and Ted Gaebler and unveiled in their 1992 book *"Reinventing Government: how the entrepreneurial spirit is transforming the public sector"*, which shaped considerably the efforts made by the Clinton administration to simplify and remove red tape from the American Public Sector through the National Performance Review (NPR).

NPM and NPR have come under intense scrutiny in recent years, with *"The Big Con"* by Mazzuccato and Collington in particular criticizing them for having hollowed out the public sector and removed much of the knowledge it internalized over the years, both key issues for digitalization, due to the requirement for specialized knowledge in managing Information and Communication Technologies (ICT) (Mazzuccato & Collington, 2023).

Since the old managing paradigms have proven insufficient to address the challenges of implementing digitalization, it follows that new paradigms have to emerge to better manage the digital transition. This matter of finding new

governance methods only becomes more urgent once you go beyond coordinating stakeholders on the national level, and begin coordinating a digital revolution on an international scale.

### 1.2 Digitalization within the EU

In the European Union, digitalization has been seen for a long time as an important objective to achieve in order to fulfill its landmark "Single Market" initiative even within the digital landscape (aptly dubbed by the EU commission as the "Digital Single Market").

While digitalization initiatives have been undertaken in the EU for the majority of the last two decades, they gained an increased significance when Ursula von der Leyen became president of the European Commission, and especially in the post-pandemic environment, with a one of its main policy priorities being "A Europe fit for the digital age".

In its introductory statement on said policy plan, von der Leyen illustrated how the digital Europe *"should represent the best of Europe – open, fair, diverse, democratic and confident"* (European Commission, 2020)

This statement in best represented in the "streams of actions" that where chosen by the Commission as the key drivers to shape Europe's digital future (European Commission, Directorate-General for Research and Innovation, 2020):

- **Technology that works for the people:** The main objective of this stream is making sure that European citizens gain benefits from the technologies rolled out on the Eu' soil, such as improved digital competences and an improved super-computing capacity to help with research in high-value sectors (particularly medicine), while also enhancing the safeguards for the more dangerous side-effects, like cyber attacks (an objective that is

only becoming more important, as hostile state actors threaten Europe and its allies' digital infrastructure[1].

- **A fair and competitive economy:** One of the main hopes of the policy program is that the European ICT sector, which has been in a rout since the 2008 global financial crisis, could receive a substantial influx of personnel and funding, both public and private alike.
- **An open, democratic and sustainable society:** Finally, the last stream of action covers the non-strictly economic facets of the EU's digitalization policy, with a focus on the environment (another topic very dear to the Von der Leyen commission, which also enacted the "Green Deal" policy strategy") and democracy, particularly in the fight against disinformation and it's citizens privacy.

In the implementation of this policy plan, the role of the public sector cannot be overstated, and it's indeed seen by both Commission and Parliament alike as an important enabler but also beneficiary of the above-mentioned streams of actions through the Eurozone. Take, for example, the Interoperable Europe Act, which entered into force this April; it sets out objectives to increase coordination between its member states' public bodies, by setting up an overarching agency and a portal tasked with organizing and monitor the cross-interoperability of the various agencies (Regulation 2024/903, 2024).

Another example would be Regulation (EU) 2021/694, which established the objectives of the Digital Europe Programme, and that specifically identified public administrations as one of the beneficiaries for the European Digital Innovation Hubs, the main vehicles for managing innovation according to the regulation itself (Regulation (EU) 2021/694, 2021).

[1] See: https://euobserver.com/eu-and-the-world/arf29e45b5

Regulation 2021/694 is also significant due to the introduction, at the EU level, of a discussion on Artificial Intelligence (AI). Back then, although there where some impressive developments, AI was still seen in the realm of the theoretical, and not yet fully practical. Now, four years after the von der Leyen commission unveiled "A Europe fit for the digital age", a new generation of AI has taken the world by storm, and governments through the world have to contend with this new development.

### 1.3 AI: the new digitalization frontier?

Let us begin by first defining what is exactly an Artificial Intelligence. IBM defines it as "a technology that enables machines to simulate human intelligence and problem-solving capabilities" (IBM); Furthermore, a distinction is made between "narrow" AI (AI that was built to solve a specific purpose) and "general" AI (which, as the name implies, is a type of AI that is capable of resolving any type of problem it is tasked with). For the purpose of this paper, the use of the term "AI" will refer only to the former case, due to the fact that there hasn't still been a confirmed case of the latter.

While nowadays the spotlight has been taken by Large Languages Models, like OpenAI's ChatGPT, there are many other types of models currently being worked on, such as Convolutional Neural Networks (which are used for image recognition), or Generative Adversarial Networks which, as the name implies, is used for the generation of a variety of contents (an example being Midjourney's image generation, or OpenAI's' Sora, which instead generates videos).

It hasn't been just the private sectors that has been dazzled by the impressive leap in technology, though; public bodies have also taken a keen interest, due to the promised improvements that the introduction of AI solutions could bring to their bureaucracy.

However, AI presents regulatory challenges that policymakers must confront. One such challenge is the "black box" effect, where the algorithms used in AI systems are so opaque that it's impossible to understand the reasoning behind specific decisions. This presents significant concerns for transparency, which is a critical tool of accountability for public bodies. As a result, public agencies may hesitate to use these technologies for significant decisions, such as determining eligibility for social housing.

Another challenge involves intellectual property infringement. Generative AIs, such as ChatGPT or Midjourney, were trained using vast amounts of data, including written and visual content. This has sparked controversy, particularly within the art community, with Midjourney currently facing legal battles over alleged use of copyrighted imagery in its training dataset. (Richardson, 2024) Regulators must thus strike a balance between fostering the AI industry and protecting the rights of content creators, which have often been trampled by the more "corporate" side of the industry.

The most significant challenge posed by this new wave of AI development, however, is without a doubt the damages that could be given to democracy and human dignity overall. We're already seeing the newest LLMs being used to actively spread disinformation through internet channels, with non-profit Freedom House reporting that they detected 16 instances of countries making use of AI technologies to "sow doubt, smear opponents, or influence public debate" (Funk, Shabaz, & Vesteinsson, 2023), or facial recognition technology being used for mass surveillance from autocratic countries. Public actors must thus thread carefully if they wish to counteract the misuse of AI from malicious actors.

These various challenges point toward an issue that is often present in tech matter: the issue of multidisciplinarity. Indeed, the fact that disparate topics such

as ethics, computer science and law interact with one another bring a layer of complexity that further exacerbates policymaker problems such as the Collingridge dilemma, wherein regulators have issues pacing themselves compared to the speed at which the AI revolution is going.

To understand how these issues are tackled by decision makers, let us now take a look at the reasonings and decisions that the EU commission and parliament took in signing the AI Act into law.

### 1.4 The European Union Artificial Intelligence Act

On the 13th of March 2024, the European Union made history by being the first sovereign body to develop and approve a law regulating the use of AI through its territory (European Parliament, 2024). While the topic covered by the regulation is a novel and constantly growing subject, the underlying ideas behind it will be very familiar to those who had previous knowledge on the EU tech initiatives.

In particular, many of the safeguards proposed by the regulation (such as, for example, the ban on prediction policing and social scores, or the higher limits imposed on "riskier" AIs) closely align with many of the final proposals that came out from the 2022 Conference on the Future of Europe (CoFE), with proposals 12 (Enhancing EU's competitiveness and further deepening the Single Market), 35 (Digital Innovation to strengthen social and sustainable economy) and 37 (Citizens information, participation and youth) being cited as impetus for the regulation.

Furthermore, as explained by Dragoș Tudorache, one of the chief negotiators of the act, the purpose of the act is to create a system of boundaries, which protect the EU's innovation drive while still safeguarding the wellbeing of its citizens (Heikkilä, 2024); the commissioner for the internal market Thierry Breton also highlighted the importance of the Act as "more than a rulebook" (Volpicelli,

2023), implying that the boundaries set out by the act could give start ups and established tech companies alike a clear outline of the projects they could work on and those they could not and, in doing so, creating a safe environment where both the former and the latter could experiment on the new advances of the AI field.

Tudorache and Breton's comments both (indirectly) show the philosophy that the EU takes when regulating innovation; the idea being that, by preemptively setting up a list of do's and don'ts, regulators can instill some clarity within market stakeholders and, in doing so, stimulate them toward the most beneficial form of innovation for the EU and its internal market. This proactive approach to regulation can also be seen in concepts like the precautionary principle, and serves as a countermeasure to the previously described Collingridge dilemma.

# CHAPTER 2

## 2.1 Digitalization in Italy

One of the funding member states of the European Union, Italy is an important linchpin of the eurozone; despite this role, however, the country has often been called a “sleeping beauty”, due to its lower productivity compared to its peers.

Among the various reasons for this lack of productivity which where proposed through the years is the fact that Italy is a laggard in the introduction of digital technologies through the various facets of society (Ottaviano & Hassan, 2013). The most recent European DESI data highlight the contradictions of the country; while it has made significant progress since the data has started being collected (ergo, from 2014 onward), it still lags behind many of its peers.

Some highlights include the fact that, despite the virtual majority of Italy’s citizens having access to (and actively using) the internet, only 45% of them have reached a basic level of digital skills, lower than the 55% average for the Eurozone. As a consequence, this will limit the potential spread of ICT solutions and products through the country.

Even when we consider the practices of training and reskilling, both seen as extremely important by the commission due to their ability of providing, on one hand, new working opportunities to workers and, on the other, allows companies to become more productive, less than 20% of Italian companies provide ICT training to their employees, compared to the European Union average of 22%; This lack of training compounds with another issue, that being the lack of specialized ICT workers. Indeed, according to the data collected by DESI, only 1.50% of all graduates have obtained a degree in ICT-adjacent sciences, which translates into only 4.20% of all employees in the country being ICT specialist (European Union).

ISTAT data on the online interactions between citizens and the public administration (PA) also shows a bureaucracy that is behind the times. As shown by *Figure 1* and *Figure 2*, at the national level, it was only in 2022 that the percentage of people over 14 who used the internet to download official modules from the PA reached over 50% (58%, to be precise), with only 35% looking up information from a PA website.

Unfortunately, there are also stark differences between the country's territories, with the Northern regions achieving higher levels of "online interactions" compared to the South, where the downloads of modules sit at 52%, and information gathering rests at a meager 25%, far below the national average. This is yet another sign of the North-South divide that has plagued Italy since it's unification, and that will further stunt the South's already limited development if not properly addressed.

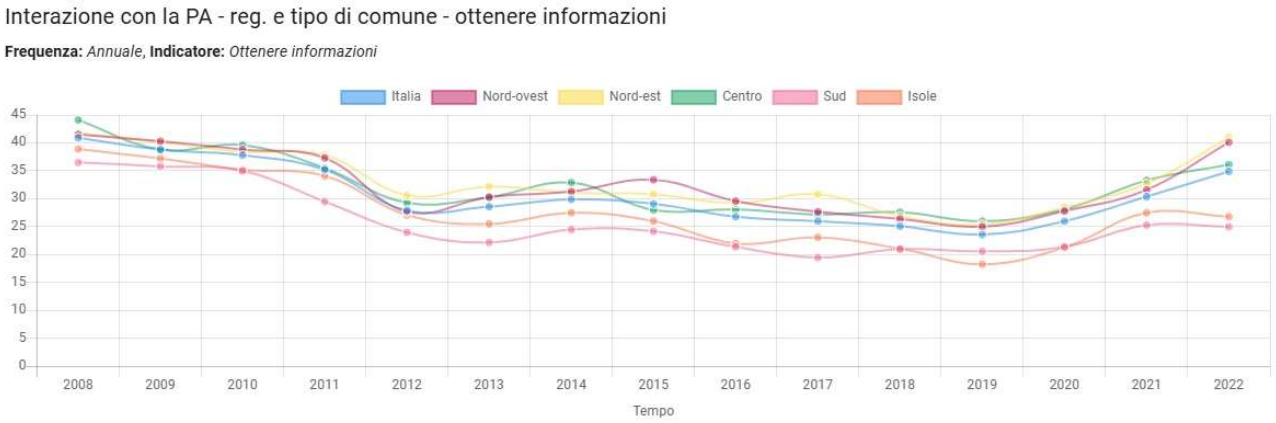


*Figure 1: Graph showing the online interactions between individuals older than 14 and the Public administration for the purpose of obtaining information. Source: IstatData*

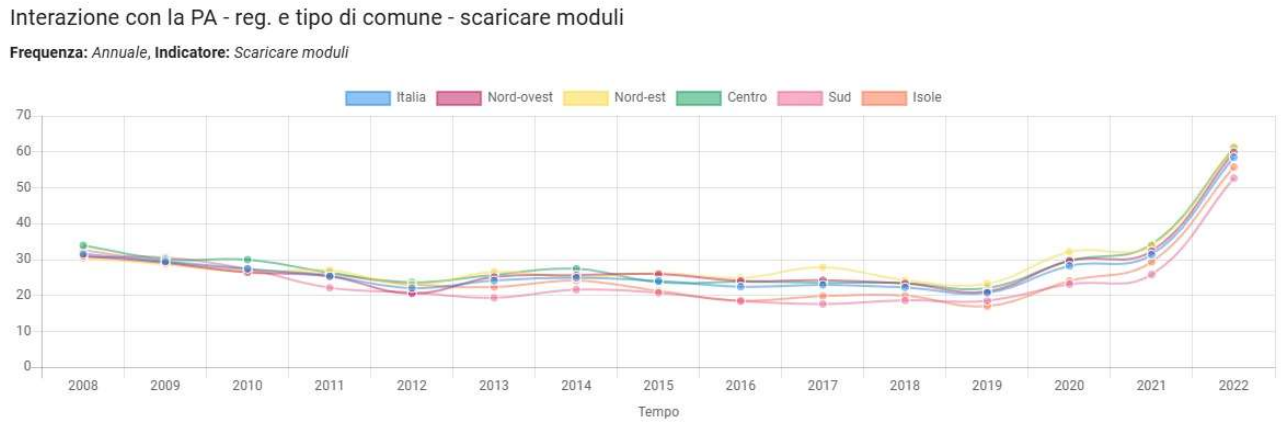


*Figure 2: Graph showing the online interactions between individuals older than 14 and the Public administration for the purpose of downloading official modules. Source: IstatData*

A cause for the slow uptake of more advanced digital solutions can also be found in the way the ICT infrastructure developed in the country. According to an occasional paper of the Bank of Italy by Emanuela Ciapanna and Giacomo Roma, the advanced state of development of the copper cable network, which uses the VDSL2 protocol to maximize the network' speed and bandwidth, has had the unintended side-effect that telecommunication companies are now unwilling to change to the optic fiber network, which provides fasters speed and an higher bandwidth at far longer distances than copper (Ciapanna & Roma, 2020).

Another major reason for the slower deployment of the optic fiber network is the topography of the country; Italy's terrain, in fact, is covered in large part by mountains and hills, which together occupy more than 76% of the country's territory. While the majority of Italy's populations lives in the plains, the population living in hilly and mountainous terrain combined still reaches over 50% of the total Italian population (European Commission, 2023). The consequence of this demographic diffusion is that there are areas where it is unprofitable for private providers to operate in, due to the high deployment costs and overall low returns. Those areas have been defined by Roma and Ciapanna as "market failure areas", with the end-result being that they lack the far more

powerful broadband access found in cities and settlements built on plains (Ciapanna & Roma, 2020, p. 13)

The consequences of the existence of these areas is that a good majority of the population is thus unable to access more advanced technologies, and this limitation mean that both private companies and public administrations alike can't reach as many citizens to offer their services too. While various governments through the years have tried to remove these market failure areas through direct economic aid, the most successful venture being the public-owned wholesale supplier Open Fiber, there is still much to do in order to eradicate the problem entirely.

All these statistics point toward a slower uptake of digitalization initiatives compared to other eurozone members, a sentiment that is also echoed in the second annual report on the state of the Digital Decade, redacted by the European Commission to take note of the progress that the Eurozone itself and its member states have reached in order to reach the objective of the Digital Decade policy plan (see section 1.2 for more information).

In the DESI annex regarding Italy, while the Commission praised the country for it's ambitious roadmap, whose objectives where in line with those set by the EU, they also indicated that, due to the fact that the roadmap itself still wasn't formally adopted on the national level, those ambitious objectives couldn't be fully fulfilled or even committed to; furthermore, a lack of clarity on three topics deemed crucial by the commission was found, those being ICT upskilling, support toward unicorns (ergo, startups that have achieved an evaluation of more than 1 billion market cap) and, more importantly for the context of this paper, AI introduction within Italian society (European Commission, 2024).

## 2.2 AI developments in Italy (temp title)

Despite the current shortcomings the country is facing with respect to the ICT environment, Italy has a robust academical and applied legacy that surrounds Artificial Intelligence. Its greatest representatives in the latter half of the 900s worked within the *Gruppo di Lavoro di Intelligenza Artificiale* (Working Group for Artificial Intelligence), which was established by the Italian Association for Automatic Computing (AINC) in the late 1970s as a way to pool talent and support in the creation of AI solutions (Incerti, 2021).

The need for the working group came to be due to the experiences the AINC had in developing an information system for the Italian State General Accounting Department, whose purpose was to predict the future income and expenses of the state. Specifically, there was a need to create an interface between the complex calculations made by the algorithms created to make these predictions and its users. The resulting work, a conflation of the expertise from mathematicians and computer scientists, was called IDIOM, an acronym for Interactive DIalogue Oriented Machine, and was successful enough that it was introduced inside NASA's NAAG library, a collection of algorithms used for the Apollo missions (Incerti, 2021).

Nowadays, most of that legacy is represented by an increasing number of curriculums that are centered around AIs (as of the time of this writing, 160 of them, divided between 53 universities), which have culminated into the creation of a "National PHD for Artificial Intelligence", started in 2021 by a partnership between the Italian National Research Center and five universities (Università di Pisa, Politecnico di Torino, Università Campus Bio-Medico di Roma, Università degli studi di Napoli Federico II, Sapienza Università di Roma)[2] to create a

[2] From the official website of the National PhD: - Dottorato Nazionale in Intelligenza Artificiale (phd-ai.it)

pipeline of researchers which will hopefully spearhead this new wave of developments.

The variety of topics covered by the various universities, formalized in the areas that each of them cover in the PhD (those being Health, Agri-food, Industry, Society and Public Administration), not only further underline the multidisciplinarity of the AI field, but also the topics that are of most interest for Italy to apply the AI innovations.

Still, a robust theoretical base can only go so far in channeling both researching, social and entrepreneurial energies needed to introduce the disruptive innovations that AI will inevitably bring through the fabric of society; There needs to be a catalyst (so to speak), in the form of a policy program whose purpose is directing these forces and allow them to synergize to reap the benefits and minimize the risks. Thankfully, we have the opportunity to examine one such policy plan, thanks to the recently released *"Strategia Italiana Per l'Intelligenza Artificiale"*, a biennial strategic plan developed by the Agency for a Digital Italy (Agenzia Italia Digitale, henceforth simply AgID) to address the structural issues that surround the Italian ICT sector, and pave the way for the country to become "a major contributor in the International Artificial Intelligence ecosystem" (AgID, 2024, p. 8).

### 2.3 Enter AgID

Before we analyze the strategic plan, however, let us take a step back and look into the agency responsible for its creation, AgID.

Established in 2012, AgID is the successor of two former governmental agencies, those being *DigitPA* and the *Agency for the diffusion of technology and Innovation*, both of which where tasked with fostering technological development in Italy, in order to ensure that the country could keep up with the

digitalization wave that was spreading through Europe at the time. After the 2008 financial crisis, and Mario Monti having to step up to become prime minister of a technical government due to the country's financial difficulties, the two precursor agencies where consolidated into AgID (Italy, 2012), both to save on costs and to have a single institutional framework which could more easily manage the country's digital agenda.

The agency seeks to accomplish this objective by primarily tackling the public sector, which was considered far behind its European peers during the period of the agencies formation; no easy feat, as it involves the modernization of government IT infrastructure, the promotion of the adoption of digital services both within the public and private sphere and, perhaps most importantly, enhancing the overall digital literacy of the population which, as previously seen, is sorely lacking compared to other European countries.

AgID's work has been foundational in projects such as the development of the initial National Digital Strategy (*Strategia Nazionale per la Crescita Digitale*), which ran from 2015 to 2020, and the Three-Year Plan for ICT in Public Administration (*Piano Triennale per l'Informatica nella Pubblica Amministrazione*), both of which have sought to lay out clear frameworks and objectives for Italy's digital transformation.

Beyond the creation of digitalization strategies, however, AgID is also behind many of the most successful projects that aimed to simplify the interactions between citizens and the public administration, chief among them being SPID (Sistema Pubblico di Identità Digitale), a system which aims to provide citizens with a secure and convenient way to access a wide range of online services provided by the government and private entities, and which has proven successful enough that over 50% of Italy's citizens uses it (AgID, 2022).

The role that AgID has played in the last 12 years meant that it is well positioned to interface with the subject of AI, both in the public and private sphere. Indeed, they've already begun discussion on the topic back in 2017, when it created a Task force for the purpose of examining the potential impacts AI could have on society (AgID, 2017). Said task force, which still exists today, redacted the first comprehensive record of the implementation of AI within the Italian PA, focusing in particular with the challenges, ranging from the ethical aspects, to questions of how to effectively study it's impacts and, finally, how to minimize damages from harmful interactions between citizens and AI (AgID, 2018).

As we shall see in the next chapter, these first few forays by AgID in interfacing with AI tech where precious in laying the groundwork for the current strategic plan on the subject.

# CHAPTER 3

## 3.1 The Italian strategy for Artificial Intelligence

Published relatively recently as of the time of this writing (on the 22nd of July 2024, to be precise), the *"Italian strategy for Artificial Intelligence"* is an important look into how AgID interpreted and is working to establish the objectives set about within the European AI Act.

The report, as explained in the preface, is the culmination of three previous plans; An "analysis on the impact of AI technologies on society and public administration" (the previously mentioned white paper) , written in 2018, "Proposals for an Italian strategy on Artificial Intelligence" developed by the ministry of Economical Development in 2020 and, last but not least, a "Strategic Program for Artificial Intelligence 2022-2024", which was a combined effort by three ministries. Those being the aforementioned ministry of Economic Development the ministry of University and Research and the ministry of Technological Innovation and Digital Transition.

In light of the fact that the strategic plan is standing on the shoulders of the previous works done by AgID and the interested Italian ministries, it incorporates (and expands) many of the concepts that where first introduced in those papers. For starters, the ethics questions that where first brought up in the initial 2018 AgID whitepaper are further developed to encompass topics such as climate change, health and diversity, and have been integrated into the (mostly economic-focused) 2022-2024 Strategic Programme.

Another "innovation" compared to the previous Italian papers and strategies on AI is the desire to tackle the education of the country's citizens on the topic on a lower level than academia, which underscores the fact that, in order for the coming AI revolution to succeed, the knowledge on how to operate AI solutions,

along with the risk attached to them, can't be just be relegated to University programs and/or the most specialized personnel, but it should also be common knowledge among the general population, thus becoming another crucial component of a citizen's digital literacy skill.

We have seen the differences of the 2024-2026 strategic plan compared to the previous works on the subject, but we have not yet seen the strategy itself; so, without further ado, let us take start analyzing the strategic plan itself, starting from its objectives.

### 3.2 Objectives of the strategy

The strategic plan is built around three main objectives, those being:

1. Helping in the creation and the development of models that support productivity, management and innovation, with an eye in maintaining a "country-specific" policy perspective in their implementation;
2. Promoting all types of research, both theoretical and applied, on a national but also international scale, particularly by continuing to work within the context of Horizon Europe;
3. Fostering an environment that is "fertile" and receptive to the introduction of AI within their contexts, for example by introducing (or training) more skilled personnel inside public and private institutions alike.

AgID emphasizes that two sentiments contrast each other in the implementation of the plan, those being the importance of AI on the geopolitical scale, but also the effect that it's implementation within society have on its stakeholders. In other words, a balance must be struck between the need of implementing cutting-edge technologies to avoid "staying behind" its peers (a fact that is already a reality, as shown by the DESI data, and that thus would only worsen if the AI revolution isn't managed successfully), and the complexity that would arise from

an improper implementation of them, which, in the Italian context, could further exacerbate issues like the infamous North-South divide.

### 3.3 Principles of the strategy

Understanding the principles that guide the Italian strategy give the best insights in the reasonings behind the long-term results that AgID and, more generally, the Italian state wish to accomplish with regards to the roll-out of AI tech through the state. Thankfully, the objectives of the strategic plan are spelled out clearly within the document, those being:

- Continue to foster the Italian academic AI community, in order to keep pace with the wider trends we're seeing worldwide;
- Harness the technology to give value to the industrial tradition of the country;
- Extend the benefits of AI toward initiatives aimed at improving the wellbeing of the citizens, for example in education and health.

Perhaps the most interesting insight we can garner from AgID's outline on the plan's general vision is the hope that, by transforming Italy into a major player of the AI ecosystem, the solutions created "internalize Italian culture and the sentiment within our community" (AgID, 2024, p. 8). While many other EU nations' plans for AI do include the necessity for it to align with European values, Italy seems to be unique in that they explicitly identify the country's own values as the preferable ones. The reasons for this need are twofold; first, an "Italian way of doing AI" would reduce the country's dependency on importing technological solutions from its peers, which would risk anthropizing the in-house capabilities, both theoretical and practical.

Secondly, and perhaps more interestingly, this strategy would "avoid the risk of homologizing and stereotyping of our culture" (AgID, 2024, p. 8). The

phenomenon that is being described could be seen as a form of digital colonialism. This may seem a somewhat controversial statement, considering current literature seems to point toward the Global South as the most affected by the phenomenon; however, intuitively, one can see that this phenomenon can also affect western country (such as Italy) as well.

Indeed, today's digital environment is dominated by ICT products that are primarily American in origin, such as Microsoft's Windows and OpenAI's ChatGPT as just a few of the many examples. This dependence on foreign-made products, as AgID also points out, can result into a process of "cultural homogenization", of the same type (if not of a greater magnitude) than what we've already witnessed during the apex of globalization. In this context, an argument for digital colonialism could be made, in that countries are increasingly reliant on US products, and thus both severely limiting the growth of their own digital sector and in the fact that a country's culture may be severely affected by the use of "foreign centered" technology. Of course, it goes without saying that these effects, as potentially negative as they are, pale in comparison to the damages that countries of the global south affected by digital colonialism are subjected to.

In any case, under this light, we can see that AgID' (and, conversely, Italy') strategy is to avoid this issue of cultural homogenization and of over reliance over foreign technology by pushing for the growth of the country's own ICT sector, which (on the other hand) has to be tempered by the need for international cooperation, especially with other fellow European countries. Indeed, the complexity of the subject translates into the fact that individual investments by a single country which isn't a superpower, like the United States or China, would be insufficient in financing all the steps needed to maintain an healthy ecosystem,

without significant sacrifices to other, equally important sectors, like health, or defense.

Moving beyond the general vision for the strategy, AgID also underlines the fields which it recognizes as being of particular interests for the country, ranging from the so-called “made in Italy” industry (which contains an assortment of industries Italy is famous for, including the automobile and food industry), to the digital and financial sectors, and the protection of data and of the territory (that is, the preservation of both the nation’s natural, as well as cultural, heritage).

Unsurprisingly, AgID sees the public administration as a “privileged domain” on which to act on, due to the trickle-down effect that it has on all other sector. In fact, it is one of the four “macro areas” that where created as a way to conceptualize the “sections” to which every strategic enabling actions, defined as the steps needed in order to improve Italy’s position as a main player in the AI ecosystem, belong to, the others being research, industry and training (AgID, 2024).

Before moving on to see the way the strategy is structured, it is important to address some of the key risks that this national plan seeks to mitigate. Beyond the already mentioned risk of homogenization (on which I will not dwell on further), there is of course the risk of over-regulation. As part of the European Union's broader initiative, "A Europe Fit for the Digital Age" (See chapter 1.2), AI development is already under a growing regulatory framework, including measures like the GDPR, the Data Governance Act, and the Digital Services Act; the AI act shall also join this framework in the near future, thus creating the risk of over-regulation of the sector if we add any potential national regulations on top of the list. AgID thus calls instead for a more “soft law” focused approach, where guidelines should be preferred in place of laws. This also has the positive

side-effect of significantly improving the “reaction time” the country has toward developments in the fields, thus allowing it to quickly respond to any potentially harmful situation by modifying, or adding, new guidelines to address it. The result is thus that the risk of “not doing” is also effectively countered.

But beyond the two extremes (that is, between doing “too much” and “too little”), there are also the obvious risks surrounding the impact this technology will have on the workforce, as well as the risks it poses on the digital divide already present within the country, which AgID hopes to tackle through the strategy itself. So, without further ado, let us begin analyzing the report itself, starting from it’s architecture.

### 3.4 Architecture of the strategy

In order to achieve the objectives set out by the strategy, AgID envisioned a “double-pronged” strategy, focused on one hand on the infrastructural deficiency that plague Italy and, on the other, implementing and monitoring the sets of strategies that where developed for four “macro-areas” that were considered critical by the agency.

The need for this type of strategic architecture is apparent: without a state-of-the-art infrastructure, the possibilities that the strategy is able to meet its objectives in all their focus areas are extremely unlikely; on the other hand, the creation of said state-of-the-art infrastructure must be justified by the existence of long-term plans that would make use of it. In other words, the “infrastructural” and “implementational” sides of the strategy are deeply interlinked, and one couldn’t work without the other.

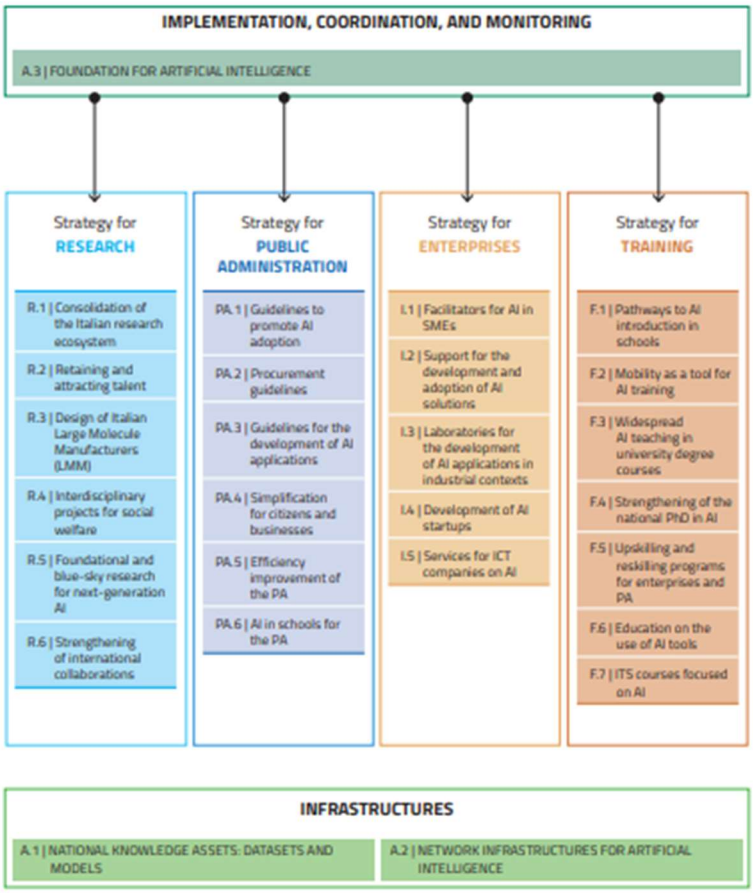


*Figure 3: Map of strategic actions. From: AgID Strategic Plan*

But what, exactly, do each of these sides entail? Let us start from the infrastructural side, to which AgID allocated two "Strategic Enabling Actions". The first action, entitled *"A.1: Patrimonio di conoscenza nazionale: dataset e modelli"* (National Knowledge Assets: datasets and models) has the creation of a national registry for databases and other types of ICT models as it's key objective. The idea behind such registry is that the data collected within, which would be "trustworthy-by-design" and "by default" (that is, the repository is built in such a way as to maximize the privacy and the integrity of the data contained within), can be collected from projects financed by the national strategy and reused for other initiatives developed either by the state itself or private stakeholders.

In tandem with the creation of this registry, a set of guidelines is expected to be developed in the near future, which will cover the aspects of access, sharing and reuse of both models and datasets contained within the registry. The end result that the agency hopes to achieve is the creation of a safe environment, where both private and public administrations alike can benefit and contribute to the registry and, in doing so, support the country's ICT sector and reduce redundancies, as well as allowing all stakeholders to build upon already established project (standing on the shoulders of giants, so to speak), thus allowing a bottom-top approach (AgID, 2024, p. 15).

Curiously, although it wasn't directly mentioned in the paper, such registry would come as a natural development for one of AgID's already established projects, the web platform Dati.gov[3], which has served as Italy's National Data Repository since 2011. If the implication is that the two repositories would be separated from one another, it would ultimately result into a duplication of effort that would stretch the already thin budget that Italy spends on digitalization initiatives.

Moving on to the second strategic enabling action, which is entitled *"A.2: Infrastrutture di rete per l'intelligenza artificiale"* (Network Infrastructures for Artificial Intelligence) which, as the name already implies, seeks to provide guidance on the upgrades needed for the aging Italian ICT physical infrastructure.

On this front, AgID more or less suggest continuing (strengthening it where necessary) the current strategy adopted by Italy to improve its broadband network, by indicating that public-private partnerships (which, in this case, would be the relationship between network operators and tech companies) are the optimal solution to contrast the problems of networks congestions (AgID, 2024,

[3] See https://www.dati.gov.it/

p. 15) (which already significantly affect the country, as evidenced in chapter 2.1).

Examples of public-private partnerships for the purpose of improving the broadband network already exist within the Italian context, one of the most important examples being Open Fiber which, as already established in the previous chapter, is a major enabler in building up a state-of-the-art fiber network even in those areas that would normally be "unappetizing" for private operators. It can thus be concluded that AgID doesn't feel the need to significantly modify the strategy currently in act, beyond some pointers on the technological solutions that need to be developed in order to alleviate the congestion that will surely arise as the data-hungry AI solutions are rolled out into the general public.

The final strategic enabling action, "*A.3: Fondazione per l'Intelligenza Artificiale"* (Foundation for Artificial Intelligence), differentiates itself from the first two due to two crucial factors, those being its purpose and the way it is organized. Whereas A.1 and A.2 are meant to address the lingering issues that affect the infrastructural side of the strategic plan, A.3 instead covers the steps needed to implement, coordinate and manage the strategic actions necessary for four macro areas that where identified as crucial for the success of the whole plan in itself. As such, they require more attention than the first two strategic enabling action, and we shall analyze them in more details in the following chapter.

# CHAPTER 4

## 4.1 The Foundation for Artificial Intelligence

As previously mentioned, a good portion of AgID's strategic plan is centered around the sub-objectives necessary for each relevant macro-area, all of them envisioned by AgID as being coordinated and monitored by a foundation, created specifically for this purpose and beholden to the Prime Minister's office (AgID, 2024, p. 16) .

In this chapter, we're going to examine each of them in more detail, along with the chapters regarding the monitoring of the strategy and the regulatory agency in charge of supervising the implementation of the European AI Act, and assess whenever they're fit to accomplish the targets they've been set out in the strategic plan.

## 4.2 Research

The first macro-area, research, is perhaps the most important of them all, due to the trickle-down effect that it has on all the other macro-areas that where indicated in the project. The aim is thus to strengthen Italy's position in the fledgling AI ecosystem, favoring a two-pronged approach that, on one hand, favors the fundamentals of AI development (that is, the development of specialized personnel and basic research on which AI solutions may be built on in the future) and, on the other, looks to stimulate the applied research that comes from the fundamental one, through multi-stakeholders public-private partnerships in sectors of important economical and social value within the Italian ecosystem. (AgID, 2024, p. 17)

The above mentioned "prongs" that make up the research strategy are further divided into six sub-actions. These range from the consolidation of the Italian research ecosystem (which, while excellent, is too diffused and lacks the talent

to allow researchers to synergize effectively), to funding for multidisciplinary and “blue sky” projects and, finally, the need for increased cooperation on the international level, presumably through continuing to cooperate on the Horizon Europe project.

As for assessing the effectiveness of these measures; while the end-objectives of the various actions are clearly explained, I believe that the split focus between theoretical and applied research could cause issues in the effectiveness of the strategy.

To make my case, I will highlight the most recent rounds of consultations surrounding Horizon Europe, which showed a deep dissatisfaction in the way founding was split between theoretical and practical research. Indeed, it was estimated that only 14% of Horizon’s budget is going to projects which lay between 1 and 4 on the Technological Readiness Level (TRL) scale (Naujokaitytė, 2023), projects that are often those most in need of government support, due to the majority of financing institutions being unwilling to give their support due to the technology being unproven.

Considering that the budget Italy can muster for such initiative will be considerably smaller than the Horizon one, combined with the already limited share of GDP spent on R&D compared to the rest of the Eurozone (1.33% in Italy, compared to the 2.27% of the EU27) (Eurostat, 2024), we can conclude that a split in focuses could have the adverse effect of hindering both theoretical and practical research; As such, the strategy should aim to effectively balance the needs of the basic and of the applied research or, even more boldly, preferring the former over the latter, in order to build a solid technical pool from which the private and public sector can draw from to build their projects, rather than simply

chasing a trend (as the strategic action R.3 , which calls for the creation of an Italian LLM, seemingly aims to do).

### 4.3 Public Administration

Among all the macro-areas that are targeted for the strategic plan, public administration is the one where AgID has the most experience in, due to its role in spearheading many of the apps that have made an impact in the digitalization of Italy's PA (See chapter 2.3 for more info).

The strategies developed for the public administration will be recognizable to those familiar with AgID's previous works, as they're in line with the overall digitalization strategy that they've been enacting since their funding. In particular, we can see the prevalent use of guidelines over more "hard" laws, so that public institutions of all shapes and sizes can fit their AI strategies within their effective capability to support them, rather than being forced into one particular path or the other (AgID, 2024, pp. 22-23). These guidelines will build upon the already present ICT guidelines developed by AgID, rather than being separate from them.

In particular, the guidelines seek to provide clarity to public administrations on procuring AI solutions, or develop their own in-house capability. These solutions, as envisioned by the strategic plan, are primarily meant as a support for decision-making, and to reduce the workload for labor-intensive (but easily automatable) activities; fortunately, we already have a ready-example that other public administrations could imitate when they introduce their own AI solution: INPS' system to automatically sort certified emails, which was recognized in 2021 by UNESCO's International Research Centre on Artificial Intelligence (IRCAI) as an "outstanding" project (IRCAI, 2021) .

Finally, to ensure that the public administration is able to make full use of the technological innovations that it will create or procure from third parties, the formation of its employees shall also be strengthened (AgID, 2024, p. 24). The reasons for doing so are obvious if we consider that, according to a research done by the Bank of Italy on the state of digitalization within the PA, 45% of all local public administrations in the country do not evaluate whether it's employees require additional digitalization training, and of the 55% of organizations that do, only 20% do so periodically, rather than on limited and infrequent occasions (Abate, et al., 2022, p. 79). Furthermore, something that isn't strictly mentioned in the report, but which would surely help with the implementation of the strategic enabling actions for the PA, is hiring more personnel, as Italy lags well behind other members in number of employees working for the local and national government which, for reference, averages around 16% in Germany, compared to the pitiful 5% in Italy).

### 4.4 Industry

The development of the "industry" macro area is centered around the reality of the Small, Medium Enterprises (SMEs) that characterizes the Italian industrial landscape. In a census by ISTAT, which examined 1 million enterprises established on Italian soil (equivalent to a third of all Italian enterprises), more than 80% of them where "micro" (between 3 and 9 workers) or "small" (from 10 to 49 workers) in size (ISTAT, 2023).

More concernedly, only 26 thousand of the sampled companies provide ICT services, a statistical insignificance in the grand scheme of things (0.02% of observed companies, for the record); furthermore, it was observed that, in the period between 2018 and 2022, there was a significant investment scale back in activities that ISTAT considers "innovative", ranging from training it's

employees in using new technologies, to buying state of the art hardware and software, to buying licenses or developing their own digital products (ISTAT, 2023, p. 16).

In light of these concerning developments, which will undoubtedly have a major effect on the spread of AI through Italy's industrial base, AgID strategy is focused on reversing this hemorrhaging of innovative investments, and push companies toward either procuring, or developing, state of the art technologies.

Of the various strategic actions outlined, which range from supporting the startup environment and formation within companies, perhaps the most interesting is I.1, "AI facilitators for SMEs"; as the name might suggest, it calls for the creations "facilitators", a type of incubator under the control of the Foundation for Artificial Intelligence, with the hope that other stakeholder foundations will also join to support this endeavor, with AgID singling out, in particular, FAIR (Future AI Research, a research hub centered on the city of Pisa), CHIPS.IT (a foundation created for the purpose of stimulating the research, and production, of microchips in the country) and AI4industry (a foundation recently unveiled by the Ministry for Industry to finance applied research of AI for industrial use).

The purposes of these facilitators would be many, but the main one center around the technological transfer needed for SMEs to properly implement AI technologies in their production processes. Besides the technological transfer aspect, however, there is also the hope that such facilitators can be of stimuli to local and national ICT companies, by employing them to create industry-tailored solutions, and supporting startups by more easily introducing them to an "industrial network" (AgID, 2024, p. 26).

While the idea of the facilitator is solid, there is the significant issue that, of the foundations cited as important stakeholders to support this endeavor, only one of

them (FAIR) is currently staffed and actively working on projects, while CHIPS.IT and AI4Industry are still seeking personnel as of the time of this writing. Thus, with two thirds of the "facilitators" major stakeholders only existing on paper for the time being, it brings into question the feasibility of implementing such institutions on a national scale, thus undermining the strategy for the industry as a whole.

### 4.5 Training

The final macro-area tackled by the strategic plan, and one that is often alluded to in the other ones, is training, or more generally education on the new AI frontier. As already mentioned, in the designs of AgID this education shouldn't be gatekept to the highest levels of education, but should also be present as a pathway at the earliest moment possible, so as to ensure that every citizen has at least a basic knowledge of the subject.

As one could easily guess, educating the population on the subject of AI is yet another facet of digital literacy, a topic of major importance considering that, as mentioned in previous chapters, the rate of Italians who achieve at least a basic knowledge of digital skills is less than 50%, and that being a laggard in this context would mean not only a slower uptake in cutting-edge informatic solutions, but also risk festering cultural and ethical issues, which in the Italian case would be the North-South divide, which has plagued the country since its inception.

Finally, while much of the strategy on education is centered primarily on the basic digital skills of the population and the reskilling (and upskilling) of the workforce to prepare for the upcoming mass introduction of AI into many workplace environments, three of the strategic actions are dedicated to cover the weak spots that the Italian academic world has with respect to AI research and, more generally, the ICT sector as a whole.

In particular, AgID calls for the strengthening of the National PHD for Artificial Intelligence (see chapter 2) by offering more scholarships and expanding the partnership to more universities, with the hopes of attracting talents not just within the country, but also internationally (AgID, 2024, p. 32).

However, education on AI of the highest level shouldn't just be limited to PHDs and STEM faculties, but should permeate through the academic world; this has the double benefit of extending the pool of individuals who are knowledgeable on the subject, and thus will be able to better adapt to the introduction of "true" AI within society (AgID, 2024, p. 31), but another potential benefit (which is not explicitly spelled out in the strategy) is the "proliferation" of ideas on the subject. Indeed, due to the multidisciplinary nature of Artificial Intelligence development, having more individuals from all paths of life and different expertise enter in contact with the topic can only be beneficial for its future evolution.

### 4.6 Monitoring the strategy

Having indicated the strategic enabling activities for each macro-area, AgID then moves on to explaining the steps needed to monitor them. Such monitoring follows the tried and tested strategies that many regulators through the last fifty years have made use of, chief among them Key Performance Indicators (KPIs), to give a quantitative assessment for the status of each macro-area project through the years. Where KPIs are not viable, perhaps due to limitation of the amount of data, more qualitative methods could be used; in either case, a panel of experts would be integrated into the foundation, and redacts a report which analyzes the progress of each project tied to a macro-area, so as to eventually correct course in case there are cost or time overruns. (AgID, 2024, p. 36)

Based on AgID guidelines, we can infer that the role that the foundation will play is one that we've already seen through other similar regulative agency, that being of a monitoring body that steers and apply corrective measures to the sector,

rather than one which is more actively involved in the implementation of the projects themselves, with few exceptions (see chapter 4.4 earlier for one such example, the AI facilitators). In other words, the foundation is being envisioned similarly to the type of agencies that where often brought up during the heights of NPM (see chapter 1.1), as a more passive participant of the ecosystem, whose only role should be to fight "market failures" and allow the private sector to "sort itself out", rather than be a more active participant, such as the American DARPA (Defense Advanced Research Project Agency).

### 4.7 Regulatory Body

The final section of the strategy diverges from talking of the strategic plan itself, and is instead dedicated to the steps needed to create a national regulatory body for AI. The existence of such regulatory body will become necessary under the new regime brought forward by the European AI Act which, according to article 70, calls for either the establishment, or the designation, of such an authority to oversee the implementation of the regulation in the member state (Regulation (EU) 2024/1689, 2024, pp. 99-100).

In implementing article 70, AgID calls for the creation of an independent agency, rather than designating an already existing one. Said agency will have to work closely with the foundation for AI which was described through this chapter, but has to be wholly independent to adhere to the regulation's requirement; Furthermore, in order to best address the multi-disciplinary nature of the regulation, the agency will have to employ specialized personnel from a variety of subject, primarily law and engineering.

An issue that is also raised in the paper is the fact that many of the aspects that will need to be regulated and monitored by this new agency are already being controlled by other national organizations, such as data protection (which is under the jurisdiction of the nation's privacy guarantor) or consumer protection

(which is currently regulated by AGCM, the agency for competition and free market protection in Italy), thus raising the risk of "over-regulation" of the subject (AgID, 2024, p. 37).

There is also the complication that such an AI-regulating agency will also have to collaborate strongly with the Italian agency for cybersecurity, due to the impact AI will have on the sector as a whole, but will still have to maintain independence for both entities, something which is explicitly indicated within the AI Act's article 70.

Unfortunately, while the strategy raises many good points on the challenges that such an agency would face, very little of this section (if none) is spent on providing solid answers to these problematics; this is an issue if we consider that, in accordance with the AI Act, such an agency must be formed, or otherwise indicated, within the 2nd of August 2025, which means only a year after the Act entered into force. Considering the need for trained, specialized workforce this (as of now) nebulous agency would have, together with the time needed to set up such an organization, perhaps it would have been better if more concrete objectives, scopes and limitations where already being defined within the confines of this strategic plan, so that it's foundation can be fast tracked.

# CHAPTER 5

## 5.1 Looking over the garden's wall: The AI Act as implemented in other EU States

To properly conclude our analysis on Italy's strategic plan for Artificial Intelligence, it feels appropriate to also look outward, toward how other member states of the European Union are tackling with the challenge of implementing the AI Act within their own country. This shall be done by examining the plans set forward by Germany and France which, together with Italy, have often been considered to be influential players in the European chessboard and, as such, their strategy for implementing the act is sure to influence the methods other member states use to accomplish the objectives of the regulation.

## 5.2 Germany

Germany's approach to artificial intelligence (AI) has been shaped by its commitment to scientific excellence, industrial innovation, and societal well-being. Since the adoption of its AI strategy in 2018, Germany has positioned itself as a key player in Europe's AI ecosystem. The country's AI strategy, updated in 2020, has set ambitious goals: boosting Germany's AI capabilities, ensuring ethical AI development, and establishing AI as a transformative tool for both economic growth and societal improvement. By 2022, the country had allocated over 5 billion euros to AI research and development, with a strong emphasis on industrial applications and the ethical challenges posed by AI technologies (Perset, Russo, & Oder, 2024)

Germany's *Künstliche Intelligenz Strategie* was designed with a long-term vision, much like France's, and focused on three strategic pillars: strengthening AI research, fostering the responsible development and application of AI, and promoting international cooperation in the field of AI. These pillars have been instrumental in guiding Germany's AI initiatives, which are firmly aligned with

European standards like the AI Act, positioning the country to lead in the responsible use of AI technologies.

One of the key strengths of Germany's AI strategy lies in its phased, multi-layered approach, which focuses first on research and development (R&D) before expanding to applied AI in industry. Between 2018 and 2020, the initial phase of the strategy concentrated on creating a solid foundation for AI research through the establishment of six AI competence centers across Germany, including locations in Berlin, Munich, and Dresden. These centers serve as hubs for interdisciplinary research, promoting collaboration between universities, startups, and industry leaders. This collaborative model has enabled Germany to rapidly expand its research capabilities, creating a fertile environment for AI innovations (European Commission, 2024).

Moreover, Germany's AI strategy explicitly addresses the ethical challenges posed by AI. The German government has been a strong supporter of the EU's AI Act, which seeks to regulate AI based on a risk-based framework, where high-risk applications (such as AI in healthcare or law enforcement) are subject to strict oversight. This commitment to "trustworthy AI" is a central feature of Germany's AI initiatives. The German Data Ethics Commission, established in 2018, has been particularly influential in shaping the country's approach to AI governance. This body works closely with the European Commission, helping to define ethical guidelines that ensure AI systems respect privacy, transparency, and human rights (Perset, Russo, & Oder, 2024)

Germany's long-term AI strategy also includes a second phase, which began in 2021, and aims to scale AI applications across the economy, especially in sectors where Germany holds a competitive advantage, such as automotive, manufacturing, and healthcare. Industrial AI, often referred to as "AI for Industry

4.0," is a cornerstone of Germany's strategy. In the automotive sector, for example, AI is being integrated into autonomous driving technologies and smart manufacturing processes. The government has actively supported the deployment of AI in industrial settings, seeing it as a way to improve productivity, reduce energy consumption, and maintain Germany's global leadership in manufacturing (European Commission, 2024)

In parallel, Germany has focused on building a talent pipeline to support the long-term growth of its AI ecosystem. The country has invested in AI education and training programs at all levels, from secondary education to postgraduate studies. The Federal Ministry of Education and Research (BMBF) launched initiatives to support AI education, including AI-specific degree programs, reskilling initiatives for workers in transitioning industries, and AI research scholarships. The *KI-Campus*, a digital AI learning platform, serves as a key initiative to make AI education accessible to a wide audience, from students to professionals (Perset, Russo, & Oder, 2024). These efforts have ensured that Germany not only retains its AI talent but also remains a destination for AI researchers and entrepreneurs from across Europe and beyond.

Germany's AI strategy also emphasizes the need for international cooperation. Recognizing that AI's challenges and opportunities extend beyond national borders, Germany has played an active role in European AI initiatives, working closely with other EU member states to foster collaboration on AI research and development. The country has also engaged in numerous bilateral AI partnerships, notably with France, where both nations collaborate on joint AI projects and seek to influence the direction of European AI regulations. This international outlook helps to ensure that Germany remains competitive in the global AI race while also contributing to the development of a unified European AI framework (European Commission, 2024).

Italy, with its AI strategy still in its developmental phase, can draw valuable lessons from Germany's experience. First, Germany's phased approach—starting with strengthening research capacities before moving to industrial applications—could serve as a model for Italy. While Italy has also made significant investments in research, the scale and coordination of Germany's competence centers provide a roadmap for creating a sustainable AI research infrastructure. Italy could benefit from establishing similar research hubs that foster collaboration between academia, startups, and industries, particularly in sectors where Italy holds comparative advantages, such as fashion, design, and manufacturing.

Another lesson for Italy is Germany's proactive approach to ethics and AI governance. While Italy has been involved in discussions surrounding the EU's AI Act, Germany has already established a robust framework for AI oversight through its Data Ethics Commission. Italy could emulate this by creating its own ethics body dedicated to AI, which could ensure that AI development aligns with European values of privacy, transparency, and fairness. This would not only bolster Italy's AI strategy but also build public trust in AI technologies.

### 5.3 France

Of the three states examined within this paper, France is perhaps the most successful among them, with its AI ecosystem composed of over 590 new startups which, altogether, raised more than 3 billion euros in 2022 (Efretier, 2024). These are unequivocally signs of a very health sector, which I believe was allowed to flourish through France' strategy on Artificial Intelligence.

Entitled *"stratégie nationale en IA"* (SNIA), French's strategy was (and is) incredibly forward looking, developed on a far longer timeframe than AgID's

own strategy, despite both more or less starting in 2018. Indeed, France' strategy was conceived with a 2018-2025 timeframe in mind, divided in two distinct phases, the first one ranging from 2018 to 2022, whereas the second started in 2021 and is expected to run until 2025.

The 2018-2022 phase could be seen as a "preparatory" phase, where the vast majority of the project's funds where invested in the creation of four interdisciplinary institutes (one each in Grenoble, Niece, Paris and Toulouse), the deployment of France's own supercomputer (the Jean Zay supercomputer, which was activated in 2019) and the creation of PHD programs with AIs as their primary subject (a project very similar to Italy's own National AI PHD programs) (General Directorate of Enterprises, 2023). The purpose of these first investments should be clearly understood as France paving the ground for its AI developments, through the creation (and retention) of a pool of talent, as well as the development of an infrastructure capable of supporting both theoretical and practical endeavors surrounding AI through the supercomputer.

On the other hand, the purpose of the second phase of SNIA is, in the words of the General Secretariat for Investment, "to disseminate AI in the economy", and make sure that AI programs and services "contribute to improving our industrial competitiveness and more generally individual and collective well-being" (General Secretariat for Investment, 2024). To accomplish these objectives, three layers where targeted by the strategy, those being a continued training and retention of talent (continuing from the first phase), the investment into "deep tech" offers, particularly embedded and frugal AI systems (those being programs which minimize the amount of resources they use, be they physical or digital) and, finally, reduce the barriers between the supply and the demand side within the country.

Beyond the work done by the General Secretariat of Investment and of Enterprise, however, other organizations within the French government have been actively working for the success of the SNIA and, more generally, for the success of France 2030 (the "grand-strategy" in which the SNIA is also included), those being the *Commission Nationale de l'Informatique et des Libertés* (CLIN), a public agency focused on data protection, and the *Conseil national du numérique* (CNNum), which is a council created to advice the French presidency on the matter of digital technologies. Both organizations are currently carrying out projects that are centered around AI, with the CNNum that started an outreach program entitled "AI Cafes" to sensitize the French public on the subject (admittedly, a weak point of the Italian strategy); meanwhile, the CLIN has taken an active role in implementing the AI Act within France, by establishing an Artificial Intelligence Department in 2023. Said department's purpose has been to prepare the other departments within the CLIN for the mass introduction of AI systems, with the main interest obviously being the protection of sensible data used within said systems. Furthermore, the department is intended to take the role of controlling authority which is asked for by the AI Act in 2025, thus France is well ahead of the timetable compared to Italy under this aspect (CNIL, 2023).

Overall, there is a lot that AgID (and Italy) can learn by examining the French strategy. For starters, the "two-phases" based strategy (very similar in nature to Germany's own strategy) has allowed France to build its capabilities in the AI sector "step by step", rather than wholesale, like AgID strategy is currently doing. Indeed, by first concentrating on the theoretical aspects of AI development, those being research and talent creation, France was not only capable of building up more funds for both basic and applied research, but these capabilities have been efficiently used in helping the second phase succeed.

Furthermore, initiatives like AI Cafes, which are intended as a bottom-up approach to sentiment collection, are an excellent method to not only present the strategy in an open environment, but also receive feedback from said environment. While AgID has also made use of the community to garner sentiment and feedback on its initiatives, the physical and informal environment in which the AI initiatives take place are bound to create a more interested and engaged crowd, though perhaps not necessarily as wide as one found through online outreach programs.

Of course, there are major caveats that make France' strategy possible: there is the matter of funding, with our cisalpine brethren spending more than 3 Billion euros to see the project through. There is also the matter of political stability, something well beyond the control of AgID: where five governments have succeeded one another between the 2018 to 2024 timeframe in Italy (four, if we consider the second Conte mandate as a continuation of the first), France has had Emmanuel Macron as president since 2017; this long-term continuity has also benefited the strategy, allowing it to pursue its objectives without significant political turmoil.

# CONCLUSIONS

As the advancements of Artificial Intelligence move us ever further into uncharted territories, it falls on regulatory agencies such as AgID to steer us clear from its dangers. But their role shouldn't be just that of a passive steerer, but rather, as Mazzucato and Collington so succinctly put it, they should "row so that they can steer" (Conclusion: A government that rows so it can steer, 2023) ; in other words, their role within the ecosystem they regulate shouldn't be limited to that of a passive observer, but they should instead strive toward becoming active engagers of it, to ensure that it can reach it's full potential while avoiding it's pitfall.

More practically, we've seen through this thesis how, through a mixed use of soft and hard laws, regulatory agencies themselves can become a font of innovation for the public and private sector alike, by setting up clear guidelines for both local and national organizations to follow and implement within their institutions. Furthermore, we've also explored the relationship between international and national regulators, and we've seen how the objectives of the former can be translated into domestic regulations for the latter.

As the European Union AI Act's provisions progressively enter into force, there will be the need for continuous coordination between the national regulatory agencies and the regulatory bodies within the European Union, something which hasn't been explored within the scope of this thesis, and which could become a subject of further studies. Furthermore, the somewhat unusual digital position in which Italy find itself may cause the insight found within the research to not be applicable to every other member within the EU.

Nevertheless, this thesis has provided a preliminary examination into how regulatory agencies can positively shape the environment they operate in, either

through the creation of their own in-house applications or the use of hard and soft laws, and how their role (be they national or international in nature) in managing the upcoming AI revolution is shaping up to be in the European context.

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