

DIGITAL SPAIN 2025

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0. INTRODUCCIÓN AND EXECUTIVE SUMMARY

Over the last two decades, successive Spanish governments have introduced programmes for digital development, in line with European digital agendas, which have provided a framework for driving forwards a process of infrastructure deployment and development of a business and technology ecosystem in a key area for economic productivity, territorial cohesion and social progress. Thus, Plan Info XXI, Programa España.es, Plan Avanza and, lastly, the Digital Agenda for Spain of February 2013 have allowed a strategic approach, which has guided a major public and private investment effort in this field.

The majority of these digital strategies and agendas have been drawn up around four areas of action: (1) the deployment of networks and services for digital connectivity; (2) the digitalisation of the economy; (3) improving electronic government; and (4) training in digital skills. Although significant progress has been made in every area, public and private investment has clearly focused on extending physical telecommunications networks.

As a result of these programmes, Spain is in a very good position to tackle the next phase of the country's digital transformation process, with a digital infrastructure network which is among the best in the world, leading companies in key sectors (health, food and agriculture, mobility, tourism, finance), modern cities and a diverse and dynamic society which is agile in adapting to change. Our country is also relatively well placed with regard to the digitalisation of government and has tremendous potential in the application of the new technologies to information management and the implementation of public policy.

However, progress has been more limited in the area of digitalisation of industry and business - especially SMEs - and also in relation to R&D+i and improving the population's digital skills. Looking to the future, these are three key levers for the digital transformation to result in increased productivity, better working conditions, better connectivity and better opportunities for development and for inclusion of the whole of society throughout the country. Furthermore, there are areas which still do not have reliable, high-quality, digital connectivity, both in rural areas and in certain industries, which creates social and regional divides, holds back the digitalisation of industry and limits the quality of the experience at tourist destinations.

The exceptional situation resulting from the COVID-19 pandemic has accelerated the process of digitalisation, highlighting its strengths but also its deficiencies, both from an economic and from a social and territorial point of view. Indeed, during the months of restricted mobility, the capacity and resilience of the telecommunications networks to handle an extreme situation of super-connectivity has been made clear, with increases compared to 2019 of up to 50% in fixed-line voice traffic, 30% in mobile voice traffic, 20% in fixed-line data traffic and 50% in mobile data traffic. Furthermore, the role of digital audiovisual services as a widespread consumer good in leisure and entertainment has been consolidated, being an accessible alternative for continuing with those activities affected by the restrictions on physical mobility. Teleworking has also increased significantly and impetus has been given to the digitalisation of education, with radical changes in methods and content.

These processes have brought to the fore the need to tackle the outstanding challenges, urgently, in order to strengthen the social, territorial and ecological cohesion of our country, ensuring that the whole of society has access to the opportunities provided by the new digital economy. That requires a particularly significant investment effort in the coming years, to strengthen digital connectivity throughout the country, helping to reduce the divide between urban and rural areas. But also to ensure the availability of adequate tools and equipment for the whole population, to give impetus to digital training, looking to the future, for workers, business owners, students, teachers and the whole education community, and to support the digitalisation of companies, reorientating the production model towards a more resilient and sustainable economy, increasing productivity, but also improving well-being and inclusion.

The above represents a huge challenge in a business fabric dominated by small and medium-sized companies, whose capacities for modernisation and production linkage are still limited, and which, on the whole, do not have the necessary resources and competences to invest in digital technologies and in the organisational changes which make it possible to incorporate their use into production, distribution and management processes¹. Hence the relevance of the public policies defined by Digital Spain 2025 to promote growth through productivity based on digital technologies, such as: (1) incentives to modernise; (2) incentives for cooperation between companies; and (3) the promotion of entrepreneurship to release latent potential for technological and organisational innovation.

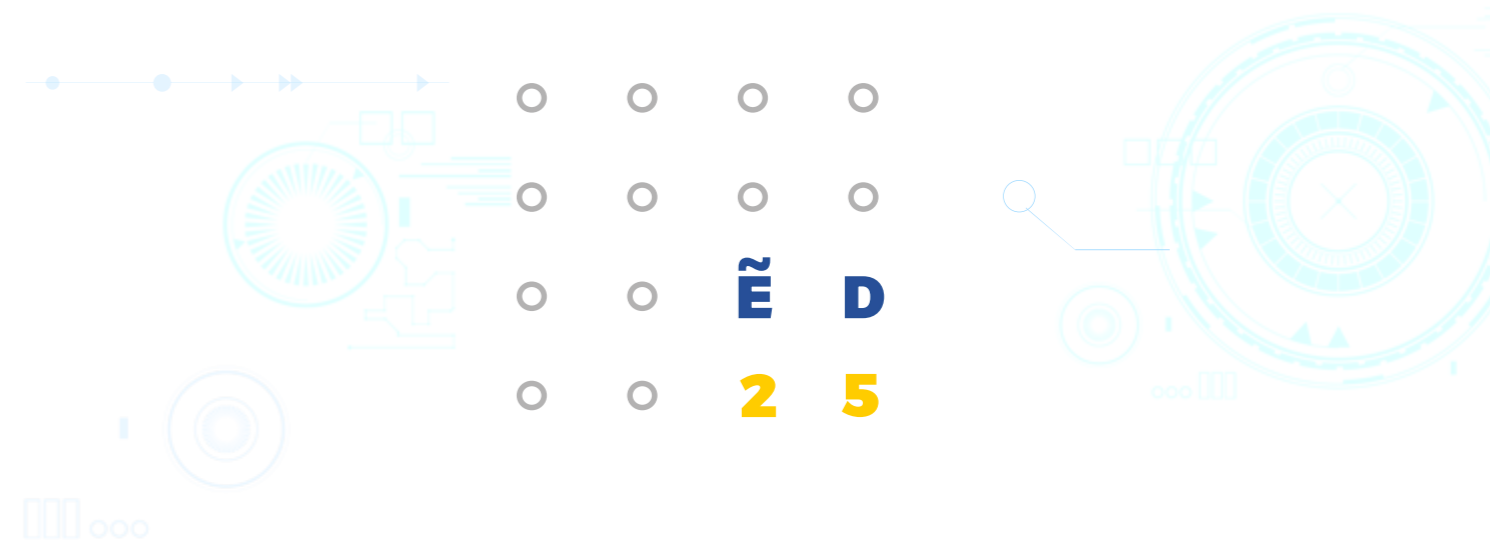
In addition to these challenges, Europe finds itself on the front line of the current, formidable, economic and geopolitical challenges, in which the multinational technology majors play a very important role. It is, therefore, essential for it to develop its own digital capacities, in order to maintain strategic independence and contribute positively to the development of suitable, responsible, just and sustainable solutions at the global level.

In this context, the European Commission has published the communication “Shaping Europe’s digital future”². The European strategy contains a set of measures for a digital transformation which benefits everyone and reflects the best of Europe: open, just, diverse, democratic and self-confident. The strategy presents a European society propelled by digital solutions which put people first, open up new opportunities for companies and give impetus to the development of reliable technology that fosters an open society and a dynamic and sustainable economy.

From the financial point of view, promoting the digital transformation is included in the European budget proposals currently under negotiation for the period 2021-2027, coordinated through the investments³ of (1) the structural funds in the different regions supported by the cohesion policy; (2) the Connecting Europe Facility; (3) the Horizon Europe R&D+i programme; and (4) a specific new Digital Europe programme.

The recent proposal of the European Commission, Next Generation EU, includes a new Reconstruction and Resilience Fund, which also has as one of its priorities the financing of investments related to the digital transformation, with a view to driving a strong economic recovery from the second half of 2020. The aim of these EU programmes is to contribute to reducing Europe’s investment deficit when compared to China and the United States, which the European Commission estimates at 125 billion euros.

This all explains the urgency of drawing up Digital Spain 2025: an up-to-date agenda which promotes the digital transformation of Spain as one of the fundamental levers for relaunching economic growth, reducing inequality, increasing productivity and making the most of all of the opportunities offered by these new technologies. And that must be achieved while respecting constitutional and European values and protecting individual and collective and rights.



¹ From aggregate production to the production-possibility frontier: productivity, technology and economic growth in the information age. Castells.

² https://ec.europa.eu/info/files/communication-shaping-europes-digital-future_en

³ https://eur-lex.europa.eu/resource.html?uri=cellar:4524c01c-a0e6-11ea-9d2d-01aa75ed71a1.0003.02/DOC_1&format=PDF

Digital Spain 2025 contains a collection of measures, reforms and investments, organised around ten strategic axes, aligned with the digital policies defined by the European Commission for the new period. The actions contained in the agenda are aimed at promoting a more sustainable and inclusive form of growth, propelled by synergies between digital transitions and ecology, which reaches the whole of society and reconciles the new opportunities offered by the digital world with respect for constitutional values and the protection of individual and collective rights:

1. Ensuring adequate digital connectivity for 100% of the population, helping to eliminate the digital divide between rural and urban areas *(2025 goal: 100% of the population with coverage of 100 Mbps).*
2. Continuing to lead Europe in the deployment of **of technology**, i, incentivising its contribution to increasing economic productivity, social progress and territorial cohesion *(2025 goal: 100% of the radio spectrum ready for 5G).*
3. Strengthening the **digital skills** of workers and of the public as a whole *(2025 goal: 80% of people with basic digital skills, of which 50% will be women).*
4. Strengthening Spain's **cybersecurity** capacity, consolidating its position as one of Europe's centres of business capacity *(2025 goal: 20,000 new specialists in cybersecurity, AI and data).*
5. Promoting the digitalisation of **public administrations** *(2025 goal: 50% of public services available on mobile apps).*
6. Accelerating the digitalisation of **companies**, with a special focus on SMEs and start-ups *(2025 goal: 25% of SME business volume provided by e-commerce).*
7. Accelerating the digitalisation of the **production model** by means of **projects which drive sectoral transformation** and produce structural effects *(2025 goal: 10% reduction in CO₂ missions as a consequence of digitalisation).*
8. Making Spain more attractive as a European business, work and investment platform in the **audiovisual** field *(2025 goal: 30% increase in audiovisual production in Spain).*
9. Supporting the transition to a **data economy**, safeguarding security and privacy and making the most of the opportunities offered by **artificial intelligence** *(2025 goal: 25% of companies using AI and big data).*
10. Guaranteeing citizens' **rights** in the new digital environment *(2025 goal: a national charter of digital rights).*

Furthermore, Digital Spain 2025 proposes a cross-cutting objective closely aligned with the Sustainable Development Goals (SDGs) and the 2030 Agenda: **making a significant contribution to closing the various digital divides**, which have become wider in recent years for socio-economic, gender-related, generational, geographic and environmental reasons. Divides relating to access to and the use of digital technologies, which have become particularly visible during the first few months of the Covid-19 pandemic and which have brought about urgent action by the Spanish government, for example, making half a million connected digital devices available to students affected by the digital divide, through the digital learning programme Educa en Digital.⁴

Digital Spain 2025, as a tool for the technological and digital transformation of Spain, **will also give impetus to the other great transition which our society must tackle: the ecological transition to a new economic and social model based on sustainability.** In that regard, digitalisation is an essential element that will help us to build a more resilient and cleaner economy, based, inter alia, on energy efficiency, sustainable mobility and the circular economy. It is a key process for achieving the ambitious goals for decarbonisation, reducing greenhouse gas emissions, uptake of renewable energy and energy efficiency set out in the Integrated National Energy and Climate Plan (Plan Nacional Integrado de Energía y Clima: PNIEC) 2021-2030.

Digital Spain 2025 is also aligned with the **Spanish Science, Technology and Innovation Strategy**, given its objective of responding to the challenges faced by strategic national sectors through R&D+i.

For all of these reasons, Digital Spain 2025 is a national policy with characteristics of structural reform with a view to the future. In order to drive it forwards, it is necessary to mobilise a large amount of public and private investment in the country, estimated to be a total of 140 billion⁵ euros in the next five years. Given the average maturity of investments and the time required to achieve results, it is necessary to concentrate investment into the first two years, in order to stimulate the reactivation of the European economy, following the fall in production resulting from the pandemic, and give decisive impetus to this strategy, which must be based on effective coordination of the initiatives at the different levels of government (European, national, regional and local) and public-private collaboration.

In order to achieve its goals, Digital Spain 2025 envisages introducing a series of structural reforms in the period 2020-2022, in the form of approximately 50 specific measures, which would mobilise a significant amount of public and private investment, amounting to around 70 billion euros in that period. The scope of the actions financed from public budgets would be around 20 billion euros, of which approximately 15 billion euros would relate to the different programmes and new financing instruments of the European Union. In addition to that would be the expected private sector investment of around 50 billion⁶ euros, in a reasonable deployment scenario.

⁴ <https://www.educacionyfp.gob.es/prensa/actualidad/2020/06/20200616-educaendigital.html>

⁵ Own estimates for the period 2020-2025 based on digital industry forecasts (Adigital, AMETIC, Digitales).

⁶ Estimates for the period 2020-2022 based on digital industry forecasts (Adigital, AMETIC, Digitales).

Public-private collaboration and the coordination of the plan with the digital policies of the EU will make it possible to multiply the impact in terms of growth, strengthening of the productivity and sustainability of the Spanish and European economies and giving impetus to EU digitalisation and European digital sovereignty, in line with the future National Technology and Global Order Strategy.

In order to strengthen the existing governance architecture, to incorporate all public and private actors, the former Telecommunications and Information Society Advisory Board (Consejo Asesor de Telecomunicaciones y para la Sociedad de la Información: CATSI) will be reactivated as the Advisory Board for the Digital Transformation of Spain. Furthermore, there will be the potential of the recently established Artificial Intelligence Advisory Board, which brings together experts from different fields relating to artificial intelligence.

These mechanisms for dialogue and participation between the different public administrations, the private sector, the academic and research world and civil society will allow greater coordination of public-private collaboration. This is something that will be channelled through a number of instruments, including, inter alia, funds, pilot schemes, key projects and innovative purchasing.

Together, we will work to make this agenda an effective instrument for the country and to provide it with adequate funding to guarantee success in tackling the digital transformation of Spain.





1. DIGITAL CONNECTIVITY

Connectivity, by means of infrastructure networks allowing adequate data transmission between citizens, companies and government, is a fundamental component of the country's digitalisation and of its territorial, social and environmental cohesion, being the key to providing the whole population with access to the services and opportunities derived from it. Just as road networks were in the industrial society, the first and essential step for the development of the digital society is the availability of infrastructure and capable, secure and capillary networks, which guarantee a high-quality connection. The COVID-19 pandemic has made plain the need for digital connectivity in every aspect of our lives and economic activity: teleworking, digital entertainment, e-commerce, distance learning, digital financial services and e-government services have alleviated the effects of lockdown on citizens and companies.

Despite Spain having highly developed connectivity infrastructure, the health crisis has also highlighted certain aspects which still need to be improved in order to achieve equality of opportunity and equal access to the networks for all regions, social groups and companies.

The networks already achieve 94% coverage for an access speed of 30 Mbps and 85% for an access speed of 100 Mbps, but they still do not reach remote areas of the country and small towns and villages with the necessary quality. This fact represents a fundamental limitation for preventing population movements, for business projects and for access to basic public and private services. Moreover, it is necessary to strengthen capacity in key areas, such as industrial zones, on account of their ability to drive economic activity.

The acceleration of the digital transformation in every sector of the economy, worldwide, is accentuating the need for global interconnection and for cross-border digital infrastructure, by means of which enormous volumes of data can be transmitted, stored and processed, respectively. This increase in the demand for cross-border digital infrastructure, combined with the widespread deployment of 5G networks and edge computing (or computing at the edge of the network), will lead to the production, flow and mass storage of data, as the number of connected objects requiring better response times and higher and more numerous transfer rates increases.

Spain is well placed to consolidate its role as an international connectivity hub, with international telecommunications networks connecting our country, directly, with four continents, an electricity network of the highest quality and a privileged geographical location for being the digital gateway to Europe.

It is, therefore, necessary to strengthen and reorientate the instruments available, in order to extend domestic connectivity and the active integration of Spain into the cross-border infrastructure which provides high-quality global connectivity, while strictly observing the principles of technological neutrality, allocation of resources based on competence, free competition and non-discrimination, and also transparency, by defining the following specific objectives:

○ Driving the economic, social and territorial cohesion of the country

Progress in infrastructure deployment is far from being uniform in every region, type of company and socio-economic group. If the Sustainable Development Goals (SDGs) and the 2030 Agenda were already leading us to commit to achieving more inclusive, safer, more resilient and more sustainable urban spaces, the pandemic has added the need to encourage sustainability from a health perspective as well. The provision of connectivity infrastructure outside urban concentrations supports the dispersal of populations and activities and promotes equality of rights and opportunities throughout the country, which, in turn, contributes to solving the problems posed by the demographic and ecological challenge.

Although great progress has been made, there is still a significant difference in coverage between rural and urban areas, between small and large companies and between different social groups. Superfast communications provide potential access to economic, social and personal opportunities, but only the use of such infrastructure encourages the emergence of new business models, as well as prosperity and well-being, as it is one of the factors which help to prevent population movements, contributing to territorial cohesion by overcoming distance. They are also an engine of progress. According to the EU, investment in ICTs has, in recent years, brought about a 50% increase in productivity in Europe⁷. The pandemic has highlighted the importance and necessity of bringing those opportunities to everyone. In order to ensure such provision of services - economic, social, administrative, medical - sufficient connectivity must be provided, at least at the key centres (educational, healthcare, etc.) in each area or region, so that particularly vulnerable groups can access basic services and not get left behind.

○ Promoting the development of digital infrastructure as a lever for economic growth

The telecommunications sector has a corporate structure characterised by a small group of operators with high turnover figures and which account for a significant proportion of employment in the sector⁸, along with numerous small and medium-sized companies acting as suppliers to the operators in different service areas (installation, call centres, commercial distribution, etc.). The sector employs 95,000 people, with a further 150,000 people employed indirectly.

The major companies in the digital sector have kept going during the crisis. Consequently, the work of those other small and medium-sized companies has also been fundamental, since they have had to deal with the unexpected growth in voice and data traffic, to hitherto unheard of levels, in a context in which their financial capacity is in no way comparable to that of the major operators. And all of this has come when a new technological era is about to begin, which will require enormous sums to be invested in order to strengthen networks, both fibre and 5G.

Support measures are required so that investments in next generation networks keep Spain in the leading group worldwide. Those measures must: (1) act as a lever to improve other key sectors of the economy; (2) allow the telecommunications sector to sustain its carry-over effect on the large body of SME installation companies; and (3) contribute to generating employment throughout the country.

○ Closing the new social divides where inequality stems from a lack of access to or use of the Internet

The digital divide with regard to access to and the ability to use networks acts, to an ever greater extent, as a vector for a new cause of social exclusion, particularly affecting the most vulnerable groups. During the COVID-19 crisis, the need to maintain, inter alia, economic activity, education and access to medical and social services by remote means has provided evidence of this new aspect of inequality. Teleworking has proved to be a great opportunity for encouraging a lower population concentration, provided that it is accompanied by access to a number of social and economic services which are available in the major urban concentrations. Preventing population movements from less populated areas or those in demographic decline, whether the individuals involved are young or old, requires the availability of digital access to essential services.

Consequently, it will be necessary to consider connectivity in a broad sense, as something which allows access, from every region and by every social group, to educational, cultural, health and social services and services relating to trade in goods and services. The extent and accessibility of telecommunications networks thus form part of a responsible and inclusive government action, intent on reducing inequality and helping to increase the potential growth of citizens and companies in every possible respect.

⁷ "How ICT Can Restore Lagging European Productivity Growth" <https://espas.secure.europarl.europa.eu/orbis/sites/default/files/generated/document/en/2018-ict-eu-productivity-growth.pdf>

⁸ <https://www.digitales.es/wp-content/uploads/2019/08/Digitales-Contribucio%CC%81n-a-la-economi%CC%81a-espan%CC%83ola.pdf>, according to DIGITALES

○ Positioning Spain as the standout centre for cross-border interconnection digital infrastructure in Southern Europe

Among its strengths as a country, Spain has a very high connectivity capacity and a great deal of growth potential. It is important to underline the resilience and security of networks and connectivity in Spain, their capillarity and their agility with regard to expansion and growth. Moreover, Spain has international telecommunications networks directly connecting our country to four continents, and it has positioned itself as an alternative landing point for undersea cables to the traditional North Atlantic routes and the Mediterranean interconnection routes, complemented by a growing data storage and processing digital infrastructure industry.

Another asset worth highlighting **Spain's status as an active part and pillar of the European supercomputing network.** In June 2019⁹, the European High-Performance Computing Joint Undertaking (EuroHPC JU) signed a hosting agreement with eight IT companies and laboratories to acquire and house a series of supercomputers, so that European researchers could access the systems to develop new uses for artificial intelligence, medications and models relating to climate change. EuroHPC chose **"Barcelona Supercomputing Center" (BSC)** as one of the entities that would host a pre-exascale supercomputer of the high-capacity supercomputer network promoted by the EU (the future computer of the BSC, MareNostrum).

Furthermore, **Spain is one of the leading countries in Europe with regard to emission-free electricity generation.** The progressive increase in generation from renewable sources of energy in the coming years will bring down the costs of electricity production.

MEASURES

1. DIGITAL CONNECTIVITY PLAN

Broadband communications infrastructure is a cornerstone of the digitalisation strategy. As well as having been an ally in fighting the pandemic, better digital infrastructure is a key engine for driving economic recovery and social inclusion.

This plan sets out a number of measures which will help, from an inclusion perspective, to alleviate the effects of the pandemic: (1) guaranteeing connectivity in order to maintain social and economic activity by remote means; and (2) revitalising the economy through the development of digital infrastructure.

The Connectivity Plan to be adopted by the government is **aligned with the European strategy of promoting and developing high-connectivity networks as the basis of digitalisation.** In particular, its aim will be to achieve the objectives stated for the year 2025 in the communication "Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society"¹⁰, published in September 2016 by the European Commission, and the policy lines with regard to extending connectivity agreed in the "Council conclusions on shaping Europe's digital future", adopted in June 2020¹¹. Alignment with the connectivity priorities of the European Union will also allow for synergies between the measures of the Connectivity Plan and relevant EU programmes, such as the Connecting Europe Facility.

The action lines of the Connectivity Plan will be, inter alia:

Connectivity for economic, social and territorial cohesion



Further progress will be made regarding adequate coverage by broadband access networks at every level: (1) rural areas, boosting, in particular, those connected with health and social care and the connectivity of the infrastructure of public and social centres; (2) urban centres and historic city centres; and (3) industrial settings, logistics centres, areas of high capacity demand (technology islands) or tourist destinations receiving large numbers of visitors and requiring adequate digital infrastructure. To that end, all available infrastructure and technology will be used, including satellite systems.

Promoting the use of digital networks and services: Connectivity vouchers



Connectivity for the Gigabit Society requires going beyond the availability of broadband infrastructure for the whole population. Connectivity between individuals, things and companies only exists if the infrastructure is used. It is necessary to promote the use of digital services, starting with productive uses, seeking support in the strengths of the Spanish electronic communications sector, in particular with regard to secure digital identity, so that any individual in any region has access to those services, even - or especially - in exceptional circumstances such as those caused by the **COVID-19**.

In that regard: (1) a line of action will be started to support the connectivity of sectoral digitalisation initiatives, which **will promote, in particular, the digitalisation of SMEs and the self-employed**, in both urban and rural areas, paying particular attention to those **sectors** worst affected by the COVID-19 crisis; (2) to enable distance learning, digital vouchers will be introduced to facilitate connectivity among schoolchildren, **in line with the programme Educa en Digital**; (3) **the possibility of rolling out social connectivity vouchers for the most vulnerable groups, linked to other programmes aimed at closing social divides and promoting integration, will be explored.**

⁹ <https://www.bsc.es/es/noticias/noticias-del-bsc/eurohpc-apuesta-por-el-barcelona-supercomputing-center-como-sede-de-uno-de-los-grandes>

¹⁰ COM/2016/0587, see <https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=CELEX%3A52016DC0587>

¹¹ <https://www.boe.es/buscar/doc.php?id=DOUE-Y-2020-70055>



Boosting the quality of telecommunications services and networks

In the middle of a digital transformation, users have very high expectations in terms of connectivity and companies face major investments in technology, which leave no room for network access failures. Consequently, quality is one of the axes of the Connectivity Plan, both as regards the quality of the services and with regard to the infrastructure which allows those services to reach the end users.

In that area, various measures will be introduced: (1) progress in protecting the rights of digital users, strengthening quality control for the services offered by digital service providers; (2) improving connectivity for communications in emergency situations, incorporating systems for the mass handling of public notices, which differentiate on the basis of geographical area; (3) promoting the renewal and maintenance of shared telecommunications infrastructure, supporting the renewal of the installations and their subsequent maintenance; (4) strengthening the inspection of digital infrastructure, based on the intelligent processing of data generated by the Telecommunications and Services User Support Office (Oficina de Atención al Usuario de Telecomunicaciones y Servicios); and (5) improving user information, by means of a digital platform which centralises the information, and supporting actions relating to connectivity.

2. GENERAL TELECOMMUNICATIONS BILL

One of the main pieces of work to be done during the course of 2020 is the transposition of Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code. The transposition of the Code requires the passage of a new General Telecommunications Act, which is better adapted to the digital reality and which replaces the current Law 9/2014.

The new law will strengthen facilities for the deployment of superfast networks, boost the deployment of 5G, revise the legal framework for emergency services and go further in strengthening the protection of digital users' rights. In particular, with regard to the roll-out of infrastructure, the Directive introduces new mechanisms which encourage infrastructure sharing, which will be carried over to the new legislation. In addition, in keeping with the provisions of the Directive, the new law will level up the obligations of traditional telecommunications operators and those of the new, digital, personal communications services, which are perceived by users to be equivalent and for which it is necessary to secure a similar level of protection of their rights. Finally, the new law will consider other relevant matters, such as the scope of the universal telecommunications service.

3. PLAN TO ATTRACT CROSS-BORDER DIGITAL INFRASTRUCTURE

With a view to making Spain a magnet for cross-border digital infrastructure, including both undersea cable landing points and data storage and processing infrastructure, the government will introduce a plan containing, inter alia, the following measures:



Categorisation of cross-border digital infrastructure as strategic infrastructure of particular economic interest

Cross-border digital infrastructure, both for communications and for data storage, can have a salutary effect, in economic, social and employment terms, which transforms the regions where it is installed. It is necessary to start considering it as strategic infrastructure of particular economic interest, facilitating its inclusion in municipal urban planning as something which requires a great deal of electrical energy, in order to plan correctly for urban access and electricity requirements.

Strengthening national interconnection with cross-border digital infrastructure



To consolidate and develop our country as a magnet for cross-border digital infrastructure, it is necessary to strengthen the terrestrial infrastructure connecting the Spanish coast and the island territories with the country's major communications nodes. Furthermore, it is necessary to promote the inclusion of Spain in global interconnection routes, promoting Spanish participation in consortia resulting from new undersea cables being landed in Spain. Synergies will be developed with the EU's Connecting Europe Facility, which envisages carrying out similar actions.

Inter-administrative cooperation to attract cross-border digital infrastructure



Due to the decentralisation of powers in urban planning, environmental and energy matters, it is necessary to enable spaces for dialogue and cooperation between the different public administrations and private actors involved. To that end, a Cooperation Forum will be set up to coordinate efforts and simplify regulations and also to conduct campaigns promoting Spain as a centre for cross-border infrastructure. The forum will be complemented by the establishment of a single point of contact for future investor entities, a single contact point at the national level to coordinate all of the administrative procedures required by the different local, regional and national regulations.

Participation in European initiatives to promote cross-border digital infrastructure



We will act within the initiatives under way within the Union to promote the existence on European soil of cross-border digital infrastructure which strengthens the digital sovereignty of the old continent. In addition to our participation in the **European High-Performance Computing Joint Undertaking** (EuroHPC JU), we will participate in others currently being developed, such as the **European Cloud Federation**¹². Inclusion in and integration with such European Union initiatives will be a strategic lever for this policy to attract investment and cross-border digital infrastructure to our country.



2. PROMOTING 5G TECHNOLOGY

Making 5G services and infrastructure available goes beyond developing a new generation of mobile telephony, opening up as yet unknown possibilities for industrial and social transformation, due to its characteristics in terms of capacity, low latency and density of connections between objects. These technical characteristics will support new uses and production models, changing relationships in global value chains and supporting the development of applications which are richer in terms of content and interactivity between people and things, which are currently being explored worldwide.

According to a study by IHS Markit¹³, 5G will allow for an Internet speed and intelligent connectivity which, in 2035, will generate approximately 3.6 trillion dollars in output and create more than 22 million jobs worldwide, just in the value chain for that technology. That, transferred to every sector of the economy, yields an astronomical figure of more than 13 trillion dollars. And, moreover, in manner which is sustained over time. The 5G value chain will invest an average of 235 billion dollars a year to continue expanding and strengthening the network infrastructure and 5G applications. For the 2020-2035 study period, the estimated annual contribution of 5G to global GDP exceeds 2 trillion dollars. In the case of Spain, according to 2016 data from the European Commission¹⁴, the economic impact of 5G will mean investments worth more than 5 billion euros and the creation of more than 300,000 jobs in our country.

It should be noted that 5G, unlike previous generations of mobile communications, is possibly going to make a bigger difference to communication between objects (the “Internet of things” or IoT) than to interpersonal communication. That means that industrial ecosystems will play a key role in the development of this new technology.

Consequently, facilitating the deployment of 5G, without setbacks, is a fundamental task for the economic development and digital transformation of the country and much more so at this time. What became known as the “Spanish fibre miracle” must be replicated in rolling out 5G networks and services. After the COVID-19 crisis, Spain’s commitment to 5G must be even more decisive, given its triple potential as a lever for reconstruction, driving counter-cyclical investment, disrupting business models with its capacity for low-latency ultra-connectivity and being an axis for territorial cohesion, acting as a new vector for extending the coverage of high-speed networks.

¹³ “How 5G will contribute to the global economy”, <https://www.qualcomm.com/media/documents/files/ihs-5g-economic-impact-study-2019.pdf>

¹⁴ “Identification and quantification of key socio-economic data to support strategic planning for the introduction of 5G in Europe”, https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=17802

The national strategy for promoting the deployment of 5G will renew the 5G National Plan (2018-2020), aligned with the European Commission communication “5G for Europe: An Action Plan”¹⁵. At the national level, the policy for promoting 5G will be aligned, at an early stage, with the revised Union action plan envisaged in the communication “Shaping Europe’s digital future”¹⁶.

In the new scenario of national economic reconstruction, the roll-out of high capacity networks and superfast connectivity infrastructure are identified as one of the levers for reactivation, having a capacity to drive job creation and consumption. Digital Spain 2025 therefore sets itself the goal of making Spain the highest-quality testing and 5G development platform in Europe, while also collaborating actively with the plans of the European Commission with regard to encouraging participation by Member States in the development of 6G, with three specific objectives:

○ **Strengthening Spain’s leading position in the development and deployment of 5G networks**

The assessment carried out in May 2020 by the European Observatory confirms Spain’s leadership in the development of 5G networks and services in Europe (30 cities and 31 pilot experiences), something which must not be slowed down by the impact of the pandemic¹⁷. The Government of Spain is, therefore, committed to maintaining that position, by quickly making available to operators the resources they require in terms of spectrum and by giving impetus to the early roll-out of commercial services

○ **Developing a reliable environment for the roll-out of 5G services**

Making the most of the opportunities offered by 5G depends on the reliability of its infrastructure, requiring that, in its deployment, adequate safety measures are taken to counteract the risks identified both nationally and globally. That effort will be given concrete form through a favourable regulatory framework which provides operators in the sector with the necessary legal certainty and brings about the right investment climate in our country.

○ **Supporting the early roll-out of 5G by economic operators**

Digital Spain 2025 will give impetus to the early roll-out of 5G networks and services, so as to strengthen and accelerate private sector actions and investment. Equally, that impetus is intended to serve as a pull factor for new investments in infrastructure. Furthermore, the ecosystems for developing 5G services for companies and government will be strengthened. The measures to support early roll-out will act around for key axes in the deployment of 5G: (1) transport corridors; (2) business solutions and social services; (3) population centres; and (4) innovative ecosystems by mean of a programme of support for R&D+i. The measures to

support the deployment of 5G will be complementary to and synergistic with those envisaged in the EU programmes, the Connecting Europe Facility and Digital Europe.

MEASURES

4. RELEASING THE SECOND DIGITAL DIVIDEND IN 2020

Releasing the second digital dividend in the 700 MHz band, currently used for terrestrial digital television and which will be used for 5G mobile communications, is a process being carried out in the context of the European Union, in conformity with the provisions of Decision (EU) 2017/899 of the European Parliament and of the Council of 17 May 2017 on the use of the 470-790 MHz frequency band in the Union. Due to the impact of the COVID-19 health crisis, the process of releasing the second digital dividend has been slowed down, making it impossible to complete it by the planned date of 30 June 2020. The European Commission has been informed of a new timetable for the process, which will conclude on 30 October 2020.

5. ALLOCATION OF THE PRIORITY FREQUENCY BANDS REQUIRED FOR 5G IN 2021

Within the European Union, the Radio Spectrum Policy Group (RSPG), in November 2016, approved the Opinion¹⁸ in which it identifies the frequency bands to be used initially for the launch of 5G in the European Union. In particular, it identified 700 MHz, 3.6 GHz and 26 GHz as bands for priority use. Spain completed the allocation of the 3.6 GHz band to electronic communications operators ahead of time. The auction for the 700 MHz band will take place after the process of releasing the second dividend, in the first quarter of 2021. The 26 GHz frequency band may have a very important role to play in applications relating to industry, logistics and utility supply services. Although contributions regarding the usefulness and management of the band were gathered from the sector beforehand, in order to have an up-to-date view of the applications requiring it, business models, availability of equipment and the associated value chain, a new public consultation will be carried out prior to auctioning the band. The process of allocating the band will take place in the second half of 2021.

¹⁵ See <https://eur-lex.europa.eu/legal-content/ES/ALL/?uri=CELEX%3A52016DC0588>

¹⁶ See <https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=CELEX:52020DC0067>

¹⁷ <https://on5g.es/espana-lidera-pruebas-piloto-5g-europa-despegue-eficaz-ecosistema/>

¹⁸ http://rspg-spectrum.eu/wp-content/uploads/2013/05/RPSG16-032-Opinion_5G.pdf



6.6. 5G PILOTS AND NEW MEASURES TO PROMOTE THE DEPLOYMENT AND ADOPTION OF 5G

In the second half of 2020, the winners will be announced in the second call for proposals for pilot projects, which has also been delayed as a consequence of the health crisis. Eight proposals have been submitted, which will be in addition to the two major projects from the first call for proposals, which are already under way. Evaluation of the pilot trials carried out will make it possible to draw conclusions regarding the most successful cases of use, the most profitable business models in the short and medium term for companies, the new possibilities that 5G may offer public services, etc. With that, it will be possible to identify actions to promote its adoption and sectoral programmes adapted for that purpose in areas such as health, agriculture, the automotive industry, tourism and manufacturing, where 5G is expected to have a major impact.

To support the expansion of the technologies in such a way that private investment is incentivised and the territorial expansion of the 5G network is stimulated, a support plan will be established, with payments associated with the installation of networks and 5G base stations in population centres, with a framework inversely related to the number of inhabitants, in order to incentivise deployment outside the major towns and cities.

7. REGULATORY PROPOSAL FOR 5G CYBERSECURITY

The European Union has committed itself to developing reliable 5G technology. With that aim, the European Commission adopted a Recommendation¹⁹ which sets out the road map which has made it possible to identify, for the Member States as a whole, a toolbox and joint measures to mitigate the security risks in 5G networks, attempting to achieve a balance between cybersecurity measures and maintaining effective competition. Spain played an active role in promoting that road map and its development, just as it will continue to contribute to Union actions to implement it, as set out in the Communication “Secure 5G deployment in the EU - Implementing the EU toolbox”²⁰, adopted on 29 January 2020. For the effective implementation of the risk mitigation measures in the national market, the Ministry of Economic Affairs and Digital Transformation has already carried a prior public consultation, in December 2019. The contributions from the public consultation, along with the European Union instruments, will be the basis for the new national legislation.

8. DEVELOPMENT OF 5G TRANSPORT CORRIDORS

Within the European Commission communication “Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society”²¹, one of the main goals to be achieved by 2025 is uninterrupted 5G cover in major urban areas and the main transport routes: motorways, national roads and railways. On the one hand, financing actions are envisaged in order to give impetus to the development of cross-border transport corridors, in the Connecting Europe Facility of the next Multiannual Financial Framework. On the other, agreements are being reached with the Member States neighbouring our country in order

to give impetus to development in common cross-border areas. Coverage of those main transport routes by the operators, as well as the range of value-added applications for them, will therefore be promoted.

The deployment of 5G must not be limited to major infrastructure and the major urban centres. The roll-out of 5G infrastructure must accompany and be part of a policy of territorial coordination and economic, social and environmental cohesion. Consequently, to complement the roll-out in primary corridors, a support instrument will be established to incentivise the deployment of 5G infrastructure in secondary corridors, such as roads in rural areas.

9. LEADERSHIP IN EUROPEAN PROJECTS FOR INNOVATION IN NEW GENERATIONS OF MOBILE TECHNOLOGY

Furthermore, as part of the path to European technological sovereignty, the European Commission has, in its communication “Shaping Europe’s digital future”, stated the need to make progress with developing 6G in the European Union in 2021²². Without waiting for the launch of 5G to be completed, the goal and the desire have been established to begin work on researching and developing 6G technology and the 6G standard in Europe.

Spain, in turn, must consolidate its position as a leading country in terms of connectivity and its position at the forefront of the development of new digital infrastructure, that is, 6G technology. To that end: (1) we will support the implementation of the updated 5G and 6G action plan announced by the European Commission for 2021 and we will give impetus to the actions it sets out; (2) we will support investment in R&D and the testing of 5G equipment and services, to encourage innovation, entrepreneurship and the establishment of an industrial base linked to the development, implementation and commercialisation of products and services related to 5G; (3) we will identify thematic focal points of interest for the development of 5G infrastructure and services, such as cybersecurity, OpenRAN, 6G, etc.; and, equally, (4) we will promote the participation of Spain’s digital ecosystem in Union funding opportunities for the development of 6G and we will look at synergistic actions in our national programmes.

²² See <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1582227177287&uri=CELEX:52020DC0067>

¹⁹ Commission Recommendation (UE) 2019/534 of 26 March 2019, “Cybersecurity of 5G networks” See <https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=CELEX:32019H0534>

²⁰ See <https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=COM%3A2020%3A50%3AFIN>

²¹ See <https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=CELEX%3A52016DC0587>

3. DIGITAL SKILLS

The digital transformation of the economy and society offers enormous possibilities for improving people's lives and increasing the productivity, competitiveness and sustainability of our economy

But, in addition to rolling out infrastructure, that requires people and organisations to have the capacity to use them confidently and securely. In that regard, it is fundamental to have the digital skills necessary to ensure an efficient and responsible use of the digital tools available. The measures developed in this area aim to equip three major target groups with digital skills, and those are the groups identified by the "Digital Skills and Jobs Coalition"²³: (1) the public, in general; (2) the active population, which includes those in work and the unemployed; and (3) technology professionals in every sector of the economy.

First, the public needs basic digital skills in order to act with confidence when communicating, obtaining information or carrying out transactions, such as making purchases, interacting with public administrations or making a medical appointment. However, current statistics show that the percentage of people without basic digital skills is 42% in the European Union and 43% in Spain²⁴. Despite this percentage decreasing year on year, there are still groups which are hit particularly hard by the lack of skills, producing new phenomena of digital exclusion.

Second, advanced digital skills are required in order to be able to carry out more complex activities, such as publishing content, doing sophisticated searches or programming and configuring simple digital systems. In the case of the active population, specific digital skills are required which are linked to the work done by an individual, such as handling complex digital tools. In this area, according to European Commission estimates, basic digital skills are required for at least 90% jobs²⁵. However, in Spain, in 2019, 36% of the workforce lacked those skills, with the situation being worse among the unemployed population (55%) than among the employed (32%)²⁶. Furthermore, employees with limited or no digital skills are more likely to lose their job, accentuating the divide even further.

²³ The Digital Skills and Jobs Coalition: <https://ec.europa.eu/digital-single-market/en/digital-skills-jobs-coalition>

²⁴ Source: Eurostat

²⁵ Communication "Shaping Europe's digital future. 19 February 2020. European Commission

²⁶ Source Eurostat

Third, there are specialists who work directly on maintaining and operating digital systems or on the design and implementation of the digital tools themselves. This group also includes individuals who work in cutting-edge areas of technology such as data analytics, artificial intelligence, cybersecurity, supercomputing, quantum computing and blockchain. In that regard, the demand for specialists in digital technologies, whether they be generalists or advanced specialists, increases continuously, year after year, without it being possible to meet that demand, either in Spain or in the European Union. While it is difficult to make homogeneous comparisons between all countries of the Union, the Commission estimates that digital specialists make up 3.9% of all employment in the EU and 3.2% in Spain.

In view of the above analysis, **, the current divide in terms of digital skills for the public, for the active population and for specialists is significant and requires joint action by the public and private sectors to close it.**

To achieve that, the education system, along with lifelong learning, play a key role, as set out in the European Commission's Digital Education Action Plan²⁷: (1) those currently in primary or secondary education or in vocational training must be assured that the education system will provide them with the digital skills required by society in order to live a full life, on both a personal and a professional level; (2) vocational training providers and universities, along with companies, must make the necessary adaptations to ensure that current and future workers have the required skills; and (3) social actors and organisations and public administrations must act to include digital skills in lifelong learning.

Furthermore, the situation created by the COVID-19 pandemic has provided even more evidence of the digital divide in the area of education, a matter which deserves extraordinary action, focused on ensuring the accessibility of technology resources and the development of the relevant digital skills. It is difficult to carry out actions aimed at improving digital skills, if the relevant individuals do not have access to the necessary technology resources beforehand. Thus, the recovery plan²⁸ presented by the European Commission on 27 May recognises initiatives aimed at the acquisition of digital skills, such as the Skills Agenda for Europe and the already mentioned Digital Education Action Plan, as key elements for promoting a fair and inclusive recovery.

For all of these reasons, the third axis of Digital Spain 2025 is to strengthen the digital skills, both of the general public and of the workforce, with the specific objectives which are detailed below.

○ Improving the public's basic digital skills and closing divides between groups

Digital Spain 2025 will promote the universalisation of basic digital skills, so that citizens can live a full life in the digital age (communicating, obtaining information, making purchases, carrying out transactions, interacting with administrations, etc.).

To that end, special emphasis must be placed on training those groups who encounter the most difficulties in acquiring those skills (inter alia, the elderly, the retired, people on low incomes and people living in non-urban areas). The goal is to train 15 million people in basic skills.

○ Equipping students with advanced digital skills and promoting digital careers

One of the education system's missions is to equip students with the skills required to live in society. These days, digital skills are at the core of those skills and demand for them is increasing year after year.

In the case of the universities, they must be attractive spaces for students to train in cutting-edge fields, as well as places of innovation and technology transfer. To achieve that, it is fundamental to create open ecosystems, by means of university innovation projects, where those professional profiles can be formed. That will require the universities to develop new, more participatory and collaborative, educational spaces, designing inter-university training, innovation, research and programming programmes and promoting contexts which facilitate new, collective, ways of thinking, learning and collaborating, based on goal-orientated experimentation, using more open and creative processes.

Consequently, Digital Spain 2025, along with the education system, will aim to set itself the goal of all students acquiring digital skills and the ability to keep them up-to-date. Moreover, the education system must encourage science and technology careers, without abandoning the arts, which will mean a sufficient number of individuals studying science, technology, engineering, arts and mathematics (STEAM), in the most equal manner possible. The goal is to train 7 million people in advanced skills.

○ Equipping workers with the digital skills required in the workplace

To enable the digital transformation of companies to contribute to increasing productivity and competitiveness, work must be done to provide workers with sufficient digital skills to have greater and better employment opportunities.

To that end, Digital Spain 2025 will prioritise closing the digital skills divide between those in work and the unemployed, in order to prevent unemployment from becoming entrenched and to enable continuous requalification throughout an individual's working life, paying particular attention to the digital divide existing in areas with a low population density and the rural world. The goal is to train 8 million people in digital skills for the workplace.

²⁷ Communication regarding the Digital Education Action Plan. 17 January 2018. European Commission: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2018%3A22%3AFIN>

²⁸ Communication regarding the Digital Education Action Plan. 17 January 2018. European Commission: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2018%3A22%3AFIN>

○ Meeting the demand for specialists in digital technologies

Digital Spain 2025 will promote meeting the demand for specialists in digital technologies, which will include experts in cutting-edge technologies, such as data analytics, artificial intelligence and cybersecurity. Particular attention will be paid to the gender balance of those specialists. The goal is to train 250,000 people in digital skills for designing, developing and using digital systems.

○ Reducing the gender divide in relation to digital skills

The gender divide with regard to Internet access, which, fortunately, was successfully reduced in previous years, has, in recent years, translated into a gender divide in digital skills. Given that situation, Digital Spain 2025 will aim to reduce that divide, both in the population as a whole and in the workforce and among digital specialists.

MEASURES

10. EDUCA EN DIGITAL

The COVID-19 pandemic has caused severe disruption to education. Face-to-face learning at educational establishments has been suspended and teaching has moved to the virtual plane, thus accelerating the process of digital transformation of education, by increasing the use of online resources, electronic communication tools and collaboration, as well as devices and Internet connections, by both teachers and students.

However, as a result of teaching being moved from educational establishments to the home, the COVID-19 pandemic has created a new digital divide, which has had a greater impact on students with difficulties in accessing devices and connectivity in their homes, who have been deprived and face greater obstacles to continuing with the school year alongside their teachers and classmates.

The programme Educa en Digital consists of a number of actions to support the digital transformation of the education system, by providing devices and digital educational resources and adapting the digital skills of the teachers, and actions involving the application of artificial intelligence to personalised education. In short, it is a programme that makes it possible to continue making progress, following the steps already taken in this area, such as the Connected Schools programme, which helps to provide educational establishments with reliable and high-quality connectivity.

11. NATIONAL DIGITAL SKILLS PLAN

This is a comprehensive plan which aims to: (1) substantially increase the level of basic digital skills in those groups which are currently worst positioned (the elderly, individuals with low incomes and few qualifications, non-urban areas, women); (2) ensure that students have advanced digital skills on completing secondary education; (3) provide workers with the digital knowledge necessary for their jobs and for future employability, increasing their productivity and also encouraging remote

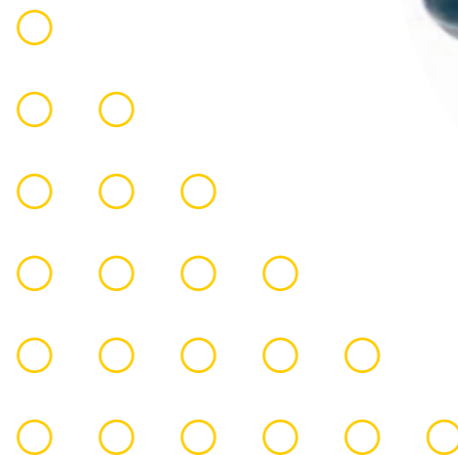
working; and (4) meeting the demand for generalist and advanced digital specialists in the Spanish economy, paying particular attention to reducing gender divides across the board.

The plan includes the relevant actions of all ministerial departments, encouraging the development of synergies with other public administrations, universities and the private sector. The strategy will include, at a minimum, the following programmes: (1) Digital training programme for the general public; (2) Digitalisation and digital skills development programme in education (primary, secondary and university) and vocational training; (3) Digital skills programme for those in work and the unemployed; and (4) Programme for specialists in basic and advanced digital technologies, such as data analytics, artificial intelligence, cybersecurity and others.

12. UNI-DIGITAL PLAN

The aim of this plan is to give impetus, within the Spanish university system, to the process of digitalisation in higher education. To that end, a series of actions are envisaged to strengthen and improve the digital infrastructure of the universities, foster the digital skills of the teaching staff and stimulate the creation of centres of inter-university innovation in training given digitally.

Furthermore, actions will be carried out to give impetus to the dynamics of innovation and inter-university cooperation in relation to collaborative working and collective intelligence in the digital context, as well as promoting and supporting the development of open access tools.



4. CYBERSECURITY

The process of digital transformation opens up huge opportunities for socio-economic development, but, at the same time, brings with it threats and risks relating to digital security from two perspectives: the damage caused by the cybernetic incidents themselves and also the undermining of confidence in the use of digital technologies, which may affect their uptake by economic operators and the general public. These two factors, protection from threats and building confidence, have a direct impact on the country's economic development and confirm the notion that cybersecurity must be tackled from a multidimensional perspective, as a key aspect of national security.

To mitigate this risk, it is essential to develop the cybersecurity capacities of the public, of companies and of public administrations, as well as building confidence through a culture of cybersecurity which permeates every layer of society. It is to this mission that Digital Spain 2025 dedicates its fourth objective.

For that purpose, the National Cybersecurity Strategy has two main organisations in this area: (1) the National Cryptology Centre, which leads the action from the point of view of national security and protecting public administrations; and (2) the National Cybersecurity Institute (Instituto Nacional de Ciberseguridad: INCIBE), which focuses on the implementation of these lines of action in relation to the public and companies.

For its part, Royal Decree-Law 12/2018, of 7 September, on the security of networks and information systems, transposing the NIS (Network and Information Security) Directive on cybersecurity, recognises INCIBE-CERT, operated by INCIBE, as a key security incident response centre for members of the public and private law entities in Spain.

In this new phase, Digital Spain 2025 will strengthen its action, through INCIBE, with three specific objectives:

○ Increasing the cybersecurity capacities of the public and of companies

Digital security, like almost any aspect connected with technological development, is an evolutionary factor and, to a certain extent, a disruptive one. Consequently, the best way to measure it is to consider that it occurs in an environment which is in constant movement.

Spain aspires to be one of the most "cybersecure" countries in the world, which pushes us to increase our levels of resilience and to have an attitude of constant improvement with regard to our cybersecurity capacities: identifying, producing and developing talent in cybersecurity and creating a cybersecurity culture which builds confidence and increases the capacity for resilience in the face of cybernetic incidents. That increase in our cybersecurity capacities must occur in different areas, such as 5G, as set out in axis 2 of Digital Spain.

○ Promoting the development of the business ecosystem in the cybersecurity sector

We will aim to increase demand for cybersecurity products, professionals and services, as well as the amount of each of those which Spain is able to produce or provide. We will also aim to increase R&D+i and the internationalisation of the cybersecurity sector: increasing the weight of our cybersecurity industry at the European level through, inter alia, talent, incentivising the formulation of public policies which favour investment and research, and promoting public-private cooperation.

○ Raising Spain's international visibility in cybersecurity

In the public sphere, Spain's participation in European projects connected with cybersecurity will be increased, and appropriate mechanisms will be established to help the private sector to increase its international visibility, encouraging the development of public-private projects on the international stage.

MEASURES

13. CYBERSECURITY HELPLINE

Through the 017 helpline, INCIBE will offer a comprehensive, high-quality and easy-to-access, public cybersecurity service, which will be free of charge for members of the public and the private sector. It will have a dual focus: on the one hand, to prevent, identify and respond to the cybersecurity incidents of any person or business in the country; and, on the other, to act as a stimulus to demand for services in the private sector.

14. STRENGTHENING THE CYBERSECURITY OF CITIZENS, SMEs AND PROFESSIONALS

Instruments to promote cybersecurity among the public, SMEs, micro-enterprises and the self-employed, to raise awareness and promote the adoption of protection measures in cyberspace. They will be focused, primarily, on small companies and self-employed individuals, who, traditionally, have not developed the culture and measures necessary for their protection, but who can increasingly be the victims of incidents.

The measure will be structured around 3 axes: (1) awareness-raising campaigns and training in digital security, both for members of the public and for companies (with particular emphasis on SMEs, micro-enterprises and professionals); (2) producing, identifying and developing talent in cybersecurity, to increase capacities and respond to the growth of the sector and of the Spanish cybersecurity industry; and (3) helplines for companies and professionals, to identify risks and adopt mitigation tools.

This measure is one of the critical factors for fostering the confidence necessary in adopting digital technologies. In this area, the government will pay particular attention to strengthening Spanish e-commerce companies, in the context of adapting to the implementation of the digital payments Directive (PSD2), to encourage the balance of Spanish commercial payments being made digitally.

15. PROMOTING THE BUSINESS ECOSYSTEM OF THE CYBERSECURITY SECTOR

Extension of the support programmes to companies, SMEs and start-ups, to help them get established, grow and expand their portfolios and to help them with internationalisation. Permanent support will be provided to the entrepreneurial ecosystem, to help cybersecurity initiatives come about, to help them grow and to contribute to their rapid internationalisation in a sector which, because of its characteristics, is favourable to that.

Moreover, impetus will be given to the CiberEmprende initiative, aimed at individuals with entrepreneurial aspirations and intended to attract and promote innovative talent in cybersecurity; it will include competitions for seed-stage projects and the consolidation of start-ups as cybersecurity ventures through public-private venture capital funds.

16. PROMOTING SPAIN AS AN INTERNATIONAL HUB IN THE FIELD OF CYBERSECURITY

On the basis of the business ecosystem created around INCIBE, impetus will be given to Spain's participation in the different international initiatives, starting with its candidacy to host the future European Cybersecurity Centre, envisaged in a regulation currently under negotiation in the European Union.

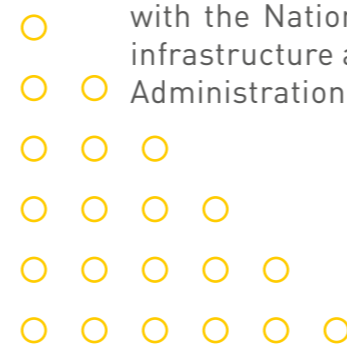
Another example is the United Nations Information and Communication Technology Facility, located in Quart de Poblet, the objective of which is to promote the digital transformation and become a world-renowned centre in strategic fields such as cybersecurity.

17. DEPLOYMENT AND OPERATION OF THE CYBERSECURITY OPERATIONS CENTRE

Impetus will be given to establishing the Cybersecurity Operations Centre, the objectives of which are: (1) improving capacities for the prevention, surveillance and detection of cyber incidents in the systems of the Central State Administration and its public bodies; and (2) optimising the capacity to react and respond to any cyberattack, all within the comprehensive framework set out in the National Security Plan.

The Cybersecurity Operations Centre will (a) provide detection of and a coordinated response to cyber incidents on a permanent basis (24 hours a day, every day of the year); (b) provide access to a catalogue of cybersecurity services, as well as advanced cybersecurity intelligence; and (c) have a centralised security information and event management (SIEM) platform, deploy endpoints at affiliated entities, carry out proactive threat hunting and provide ticketing and engineering services for the process of onboarding entities to the service. The services will be based on technologies which make use of artificial intelligence and machine learning to facilitate reaction based on the analysis of bulk data flows, reducing vulnerabilities and carrying out continuous surveillance.

By helping to improve the security situation of each entity and its level of awareness of that situation, the Cybersecurity Operations Centre will act as a facilitator for compliance with the National Security Plan (NSP); in particular, it will help in the context of protecting infrastructure and common and shared services provided by the General Secretariat for Digital Administration.



5. DIGITAL TRANSFORMATION OF THE PUBLIC SECTOR

Technologies such as artificial intelligence, blockchain and the exploitation of information by means of big data are leading us towards data-driven public administration, in which the personalisation of services and new ways of relating to the public, such as 360° Citizen are key.

Spain is among the most advanced countries in Europe in terms of e-government development, moving up in the European Commission's Digital Economy and Society Index (DESI) 2020 to second place among the 28 Member States of the European Union in the ranking for digital public services²⁹.

All of the indicators remain significantly above the European average and the score increased from 80.9 points in 2019 to 87.3 points in 2020. Moreover, the indicators show a high level of online interaction between public authorities, citizens and businesses. Spain performs very well on the open data indicator, occupying second position with 90% of the maximum score. And it is notable that 82% of Spanish Internet users actively engage with e-government services, well above the European Union average of 67%.

This position has been achieved thanks to the continued effort of the public administrations in adapting their electronic services in order to offer an ever greater number of services, which are both more efficient and better adapted to the demands of the public and of companies. In that effort, Spain's strategy has been based on strengthening the foundations which make complete electronic processing possible and on developing platforms which can be used freely by all of Spain's administrations and which are in line with European interoperability plans. Some notable initiatives in that regard are, inter alia, those relating to identity, signature, records, data interconnection, notifications, contracts and electronic invoicing.

But the mere existence of electronic services does not produce efficiency, nor does it reduce administrative burdens; **in order to achieve effective and secure mass use by the public and by companies, processes also need to be modernised and channels adapted. Consequently, there is room to improve, to meet their demands and to fulfil the commitment to excellence on the part of the public administrations.**

²⁹ <https://ec.europa.eu/digital-single-market/en/scoreboard/spain>

Among the great challenges facing government are the technological changes occurring as disruptive technologies mature, the new paradigms for interacting with administrations and the efficient reutilisation of information.

It is fundamental to get to grips with measures which ensure the democratisation of access to these emerging technologies, guaranteeing a framework for the speedy deployment of efficient digital public services, which are secure and easy to use, all based on a dynamic and flexible IT infrastructure model.

In all of these processes of innovation, the use of open-source software must be considered, as well as the release, in the same way, of the products created.

Furthermore, the universalisation of the use of mobile phones as the preferred device for accessing digital services is also changing the way in which information is obtained and administrations are interacted with, and that requires continuous adaptation to the demands of the public and of companies, so that government services and their users can remain in step.

In general, there is a demand for services which are more personalised, easier to use and better adapted to our particular needs, and there is also growing demand for higher levels of security and respect for the environment. All of that makes it necessary to make significant changes to the way in which public services are provided and to the infrastructure which supports them. The public administrations must innovate on a permanent basis. They must lead by example and be one of the engines of the country's digital transformation. They must maintain their permanent commitment to the public and to businesses to offer the best public services possible and promote collaboration with the private sector and social organisations, in order to find solutions to the new demands on public services.

This conception also includes a commitment to transforming the digital relationship with the public and with companies by modernising the digital services provided by the public administrations.

This process of transformation will be directed towards the following specific objectives:

○ Simplifying the relationship between citizens and public administrations

It is fundamental to develop a citizen-focused model of administration. To that end, all interactions with the public and with companies must be progressively consolidated in a single point: the Citizen's Folder - increasing the proactivity of the public administrations by means of notification systems which are better adapted to the demands of citizens and of companies.

As part of this strategy, the Central State Administration has made agreements with various bodies representing business and society (the Spanish Chamber of Commerce, CEOE-CEPYME, ATA and CERMI), so that those organisations can contribute their experiences to the simplification process. The objectives of those agreements include analysing the administrative burden associated with electronic administration and the development of the digital society and its impact on relations with public administrations. These measures will be incorporated annually into the Central State Administration's plan for administrative simplification and burden reduction.

With a view to optimising those processes having the greatest impact and which are capable of being optimised, for the public, for large companies and for SMEs, solutions will be addressed which include automation as a structural factor, in order to simplify those processes and consequently reduce administrative burdens, and progress with implementing and simplifying new identification mechanisms will be encouraged.

Lastly, it is fundamental to strengthen digital administration with updated portals and a click-less strategy, which makes the digital services of the administrations easier to use for the public and for companies, ensuring accessibility for everyone and allowing the services for which there is most demand to have an "omnichannel" orientation.

○ Personalising digital public services. Towards a 360° Citizen model

These days it is not sufficient for public services to be accessible online. They must also be easy to use and, as far as possible, adapted to the needs of each person. To ensure respect for the protection of personal data, requests for data which are already held by administrations must be kept to a minimum, encouraging hyperconnectivity between services, and it must be possible to personalise the notification mechanisms for which citizens opt. This is the objective which guides the design of the new digital public services of the public administrations, incorporating, to that end, artificial intelligence and natural language processing.

In short, placing the focus on a model for dealing with the public which is personalised, proactive and omnichannel, open to the incorporation of new channels and value-added services, and fully adaptable, based on user experience.

○ Incorporation of all administrations in the digital transformation of the public sector

The implementation of Digital Spain 2025 must allow all citizens and territories of the state to benefit from the improvement in the provision of public services resulting from the processes and initiatives set in motion.

In that way, it will be possible to facilitate territorial coordination and cohesion, reducing the digital divide in the services offered by the Central State Administration, the autonomous regions and local authorities, improving the interoperability of public services and, in short, facilitating access to the services by citizens, including those residing in less populated areas.

Moreover, impetus will be given to the participation of the different administrations in the process of digital transformation of the public sector, especially through collaboration by means of sectoral conferences, as organs of multilateral cooperation.



○ Digitalisation of the services provided by the Central State Administration in Spain

As well as ensuring that the state has a presence throughout the country, the regional offices of the government constitute an element of cohesion and integration, guaranteeing the necessary unity of action on the part of the government throughout the country and the right of citizens to receive services on equal terms.

Furthermore, the digital transformation of the public sector provides opportunities to improve public services and adapt them to the specific needs of citizens and the regions in which they reside, **and also to decentralise the provision of the services, thereby helping to tackle the challenge of depopulation.**

With this approach, it is fundamental to give impetus to an ongoing plan for the digitalisation of the Central State Administration, in which the government’s regional offices, as a single point of contact for an essential part of the Central State Administration in the region, are a point of reference.

○ Updating the technological infrastructure of the public administrations, moving towards consolidation, security and respect for the environment

The public administrations have a great deal of computer equipment and calculation centres distributed across numerous installations. These days, it is necessary to move towards a liquid infrastructure model which allows those centres to be consolidated into just a few, improving the performance of the equipment, making them easier to manage and increasing their availability and security. At the same time, that will make it possible to reduce the overall energy consumption and pollutant emissions of the calculation centres (according to the World Energy Forum, the ICT sector consumes between 5 and 9% of all electricity worldwide and is responsible for more than 2% of all emissions)³⁰. An ambitious process of consolidation will be pursued and a Cybersecurity Operations Centre will be established for the Central State Administration and its public bodies.

All of this will be done with a focus on developing an information architecture which supports the cross-cutting vision of data as a service and ensures the hyperconnectivity of services and data.

○ Promoting the digitalisation of public services and the introduction of artificial intelligence in the coordination and implementation of public policy

The design of a framework to promote the intelligent digitalisation of government is fundamental to maintaining the pace of development presented by the digital society.

Promoting the application of automation services, reusable artificial intelligence capacities and intelligent management services will facilitate an effective transformation of the processes for coordinating and implementing public policy, simplifying and automating those processes which result in greater public well-being and business efficiency.

To that end, impetus will be given to the development of “as-a-service” cognitive automation services for the Central State Administration, which allow the implementation of models applying artificial intelligence to improve the efficiency of processes and areas such as cybersecurity and which can be reused at every level of the public administrations.

MEASURES

18. APP FACTORY FOR THE DEVELOPMENT OF PERSONALISED SERVICES FOR THE PUBLIC

Updating of the Citizen’s Folder, using simple, accessible, language, with digital identification systems which are secure and easy to use. It will include: (1) the organisation of personal content by subject, simplifying access to personal data and information regarding the progress of ongoing procedures, giving citizens a 360° view of their position with the government and democratising access to data (one-click data); (2) a calendar for planning common procedures (identity document, driving licence, MOT, etc.) and making appointments with different bodies (identity document, passport, immigration, etc.); (3) a virtual assistant to deal with queries regarding the services offered, providing omnichannel assistance; and (4) the development of mobile applications.

Thus, among others, a mobile application will be developed to allow citizens to request and manage prior appointments for access to services provided in person, which will avoid crowding at service centres.

In addition, for Central State Administration staff, a mobile application will be developed to speed up access to its general services and personnel procedures. Use of the Funciona portal and website will also be boosted for use by other public administrations, such as autonomous regions and local authorities.

19. MULTI-PLATFORM ACCESSIBILITY OF PUBLIC SERVICES

Promoting hyperconnectivity and emerging technologies such as artificial intelligence also requires the evolution of existing identification and signature systems towards simpler models that are easier for citizens and public employees to use, including in the mobile environment. That must be done ensuring the existence of single system of secure identification throughout the country, based on the national identity document and aligned with the European system of recognition of electronic identities (eIDAS).

³⁰ Communication “Shaping Europe’s digital future”. 19 February 2020. European Commission



Specific applications will be developed for the public services for which there is most demand (in collaboration with all ministerial departments) and institutional portals will be adapted to be displayed and used on mobile devices. The systems for managing procedures will also be developed, using adaptable management solutions, in order to systematise and facilitate organisational processes.

Además, se creará una plataforma reutilizable de servicios de lenguaje natural, fomentando intelligence capacities, to facilitate data management. It includes: (1) homogenisation in the provision of services; (2) improving the accessibility of the websites and applications of the public administrations, to support inclusion, in compliance with Directive (EU) 2016/2102 of the European Parliament and of the Council of 26 October 2016 on the accessibility of the websites and mobile applications of public sector bodies and Royal Decree 1112/2018, of 7 September, on the accessibility of public sector websites and mobile applications; and (3) the development of mechanisms for connection with the EU's single digital gateway, as provided for in Regulation (EU) 2018/1724³¹, for the provision of cross-border services.

20. CENTRALISED ELECTRONIC NOTIFICATION SYSTEM (SCNE) AND REGISTER INTERCONNECTION SYSTEM (SIR)

Bringing into service the Centralised Electronic Notification System for citizens and companies, with the possibility of automated access to electronic notifications for large companies, enabling automated processing solutions (intelligent automation as a service). Moreover, this system will be interconnected with the Electronic Register of Powers of Attorney, supporting integration across services.

Furthermore, the connection of the all of the public administrations to the Register Interconnection System (Sistema de Interconexión de Registros: SIR) will be completed, supporting digital hyperconnectivity between administrations and the interoperability of registers, taking into account, in designing it, the various uses of the information and, in particular, statistical uses. The data intermediation platform will also be the means of enabling automated processing, supporting the construction of unattended decision-making systems, avoiding asking citizens and companies for information already held by other administrations.

Finally, impetus will be given to electronic invoicing in relation to public sector contracts, enabling the notification of assignments of receivables.

³¹ Regulation (EU) 2018/1724 of the European Parliament and of the Council of 2 October 2018 establishing a single digital gateway to provide access to information, to procedures and to assistance and problem-solving services and amending Regulation (EU) No 1024/2012 .

21. UPDATING THE TECHNOLOGY INFRASTRUCTURE OF THE PUBLIC SECTOR

The infrastructure of the Central State Administration through which services are provided to the government itself by means of a private cloud will be strengthened, allowing the infrastructure and equipment of various other executive bodies to be accommodated. In that way, obsolete data processing centres will be eliminated, reducing energy consumption and the carbon footprint. That infrastructure will, in turn, be complemented by other services provided by public cloud providers, which will be used for particular needs.

Another of the major objectives is to promote the study and application of the latest emerging technologies in the area of communications, such as quantum communications, in order to offer better performance, including in terms of security.

The specific lines of action for updating the technology infrastructure of the public sector are set out below:



Cloud strategy for the Central State Administration

Initiation of a strategy which prioritises the provision of services based on cloud technologies by the different departments of the Central State Administration, using, in the first instance, their own resources and complementing them with private-sector solutions, achieving synergies which result in better provision of the services. At all times, the security and privacy of the public's personal data will be a priority and will be guaranteed.

This strategy will make it possible to consolidate the data processing centres of the Central State Administration in a smaller number of centres with better performance, reducing operating costs (financial and environmental) and maximising the agility of ICT operations; they will also adapt quickly to the demands of society, without their infrastructure being a burden or obstacle.

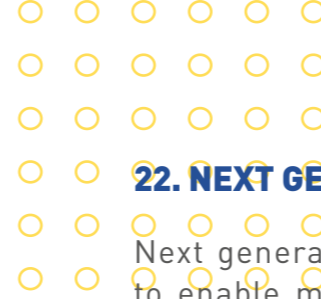
The participation of the Central State Administration's cloud infrastructure in European Union initiatives, such as the European Cloud Federation and GAIA-X, will also be strengthened.

Likewise, secure interconnection with private-sector providers of cloud services will be strengthened, ensuring European security and privacy requirements are met.



Lastly, impetus will be given to the deployment of data processing centres at the EU level.

The measures will be coordinated to ensure the participation of the different administrations in initiatives relating to the use and implementation of cloud projects, in particular in the context of the European Cloud Federation, so that the resulting benefits reach the whole country, achieving greater integration in the provision of services and ensuring adequate cybersecurity for all public networks, in line with the provisions of the NIS Directive.



22. NEXT GENERATION WORKSTATION

Next generation workstation, connectivity and collaboration solutions will be fostered, to enable mobility and remote working for public employees. Those solutions will be designed in accordance with whatever new regulations are made on remote working for public employees.

The possibility of providing services from various locations, not limited exclusively to workplaces, will require particular attention to be paid to the cybersecurity conditions of workstations, for which advanced detection and protection capacities will be required, enabling them to be used for remote working with all the necessary security guarantees.

It will also be fundamental to pay particular attention to reskilling public employees, to enable them to adapt to this new way of working. In that regard, the National Public Administration Institute (Instituto Nacional de Administración Pública: INAP) will implement a training plan for public employees in the digital skills necessary for that adaptation.

23. IMPROVING THE REGULATORY FRAMEWORK FOR DIGITAL ADMINISTRATION

The draft Royal Decree implementing Law 39/2015, of 1 October, on the common administrative procedure applicable to public administrations, and Law 40/2015, of 1 October, on the legal regime applicable to the public sector, relating to the operation and functioning of the public sector by electronic means, will strengthen the regulatory framework defined by those laws. That will improve efficiency, in order to give effect to a totally electronic and interconnected administration, as well as increasing the transparency of administrative actions and public participation in e-government.

This effort to improve the regulatory framework will also take into account the new constitutional case law, which establishes that the state has competence in matters of cybersecurity, not only under article 149.1.18 of the Spanish Constitution, but also in accordance with the provisions of article 149 of the Constitution, sections 21 and 29, which confer exclusive competence on the state in relation to telecommunications and public security, respectively.

24. KEY PROJECTS FOR THE DIGITALISATION OF PUBLIC SERVICES

Urgent initiation of digitalisation processes in strategic areas, in order to strengthen the efficacy and efficiency of the public sector in the provision of those public services which are fundamental to public well-being and economic productivity, giving impetus, in turn, to a culture of promoting innovative public procurement.

Projects will also be adopted to begin the process of developing the infrastructure to serve as the data aggregation framework for the analysis and exploitation of data using technologies based on big data and artificial intelligence.

Among the areas with greatest potential for digital transformation within the Central State Administration, there are various opportunities, including:



Public administration based on secure data: impetus will be given to the development and improvement of the digital public services to be provided by public administrations, such as the provision of information, an open data approach, the analysis of consolidated data and the automation of processes, always with a particular focus on data protection. In particular, a secure framework will be developed for the interconnection of databases and the management of data in the area of public health.



Digital justice for the public: common services will be incorporated which facilitate and improve the relationship with the public and their interaction with public services. The legal aid management application will also be developed and improved, aimed at safeguarding citizens' rights, and impetus will continue to be given to digitalisation processes by including procedures in the electronic sphere.



Digitalisation of the state employment service (SEPE): by applying systems based on big data and knowledge management technologies, solutions will be pursued to improve employment advice services, benefits monitoring and even the modernisation of the applications which make it possible to make use of data and which contribute value in decision-making.



Digitalisation of inclusion policies. Social security and migration: impetus will be given to the analysis and evaluation of benefits, policies and programmes having an impact on inclusion goals, by means of the digitalisation of procedures, innovation and optimisation of processes, and the incorporation and advanced exploitation of large-scale information from external sources and bodies. Those results will be the starting point for reviewing indicators, defining objectives and designing strategies, policies and programmes, using data-based decision-making, with the aim of reducing poverty and inequality, supporting legal migration and promoting inclusive growth.



Digitalisation of the services provided by the government's regional offices: among other measures, impetus will be given to expanding the electronic processing of the services provided to the public in relation to the most important procedures, particularly those relating to immigration, and also to the digital modernisation of the citizens' advice and information offices, among others, as well as the internal procedures of the regional offices.



Improving the digital infrastructure for connecting with local and regional authorities and giving impetus to the smart regions programme: the digital applications for connecting with the autonomous regions and local authorities will be improved, in collaboration with single-province autonomous regions, provincial councils, town councils and island councils (e.g. speedy processing of subsidies to alleviate damage caused to infrastructure by natural disasters). Furthermore, assistance will be given to those local authorities which, on account of their small populations, have limited material and personal resources. Impetus will also be given to Smart Regions/Smart Cities initiatives, in order to facilitate the intelligent provision of public services throughout the country, resulting in higher-quality services, provided more efficiently, with a particular emphasis on the local and rural level.



Trusted smart statistics: the use of big data will be encouraged and promoted for preparing and improving statistics for use by the state, seeking to create synergies with the private sector, following the recommendations of the expert group established by the European Commission.



Consular digitalisation plan: measures will be put in place to facilitate and improve access to the digital services of the Spanish public administration, both by Spaniards living abroad and by citizens of other countries.

In addition, work will be done with all ministerial departments and with the different levels of the public administrations on gradually exploring, launching and giving impetus to other strategic opportunities for the digitalisation of public services. One example is promoting the digital transformation of the health sector through innovation, research and strengthening the National Health System (Sistema Nacional de Salud: SNS) and empowering individuals.

25. GOBTECHLAB INNOVATION LABORATORY

Developing innovative pilot schemes for the application of advanced technologies to the transformation of public services, with the aim of making them more inclusive, efficient, usable, accessible and transparent. In particular, it will involve developing systems and protocols which make it possible to ensure that individual and collective rights are protected in any new application or technological development by the public sector, throughout the country.

The laboratory will also seek to create personalised and innovative public services which are in line with European actions, participating with the Member States of the European Union in projects such as the European Blockchain Services Infrastructure (EBSI: a blockchain network that will make it possible to provide public services securely throughout the European Union) or proposals related to data and artificial intelligence.



6. DIGITAL TRANSFORMATION OF BUSINESS AND DIGITAL ENTREPRENEURSHIP

The digitalisation of the economy requires the transformation of companies to adopt the new processes, invest in new technologies and staff training, apply digital technologies to the transformation of their business and thereby increase productivity, competitiveness and future profitability.

Spain, in comparison with the EU average, performs well with regard to companies' digital equipment (above the average); but it performs less well in relation to e-commerce (below the average), above all in the case of micro-enterprises with less than 10 employees, which make up most of our country's business fabric³². Among the reasons which explain this low level of digital development are the unequal performance across sectors, where the most technological sectors have digital skills 3 or 4 times greater than other sectors, and the poor performance of small companies compared to large ones, with worse digitalisation rates and bigger differences between the most and least digitalised sectors.

In Spain, the two effects combine: it is a country of small businesses (less than 50 workers), micro-enterprises and self-employed individuals, which make up of 99% of all companies and 50.5% of employment, and it is a country with low participation by technology companies in the economy as a whole.

Furthermore, wealth creation, the distribution of opportunities and the development of innovation are intimately related to entrepreneurial capacity. And, according to the latest edition of the Global Entrepreneurship Monitor, the potential entrepreneurship rate in Spain was 6.8% in 2018, well below the average of the EU 28 (14.1%), as was the case with entrepreneurial activity (6.4% compared to 7.7%). Moreover, Spanish entrepreneurship is characterised by the small size of small and medium-sized companies. In that same regard, deficiencies and inadequacies with regard to qualifications do not only reduce Spain's economic performance, they also make it difficult to disseminate technology and develop innovation skills in our country.

The creation of new companies is one of the best indicators of a country's entrepreneurial spirit, thanks to their capacity to generate employment and capital. In 2017, in the case of the ICT sector, the rate of creation of companies in Spain was 11.76%, slightly behind the United Kingdom (12.4%) and France (13%) and minimally below the EU average in 2016 (12%).

³² <http://www.ipyme.org/es-ES/ApWeb/EstadisticasPYME/Documents/CifrasPYME-enero2019.pdf>

However, there are certain factors which indicate the need to act in order to improve the environment in which companies of this kind develop. First, their slowness to reach maturity: 56.3% of start-ups are at the “early” stage and only 24% are at the “scale-up” stage. Second, the unequal distribution of venture capital among companies in the different phases: in Spain, most venture capital (60%) goes to support companies at the “seed” stage. Next in importance are companies at the “intermediate” stage (32%) and, lastly, those at the “scale-up” stage (8%). Third, the difficulty in achieving revenue outside Spain. Despite most start-ups having an international presence (80%), only 37% have revenue outside Spain.

Furthermore, it is necessary to tackle the issue of gender equality in relation to the creation of start-ups, as only 15.6% of Spanish start-ups were founded by women.

In this axis, Digital Spain 2025 will address a number of measures with the following specific objectives:

○ Accelerating the digital transformation of SMEs

It is urgent to increase, substantially, the support offered to SMEs in their process of digital transformation, strengthening skills networks to support innovation for digitalisation, identifying and reducing barriers, revitalising and sensitising the productive fabric, assisting SMEs in processes of organisational change and in the development of new production and business models, among other instruments, and ensuring, at all times, the efficacy, efficiency and rationalisation of the public technical and financial resources placed at the disposal of SMEs, in order to maximise the impact on the competitiveness of the economy and on job creation.

Achieving that will require the participation and commitment of all the actors involved, both public and private, who have spent years working hard to support companies and developing programmes aimed at their digital transformation. They include, among others, Red.es, ICO, CDTI, EOI, the Chambers of Commerce, business associations, professional associations, etc.

○ Promoting national digital entrepreneurship and international digital entrepreneurship located in Spain

Digital entrepreneurship in Spain is slightly below the average for the EU and behind countries such as France and the United Kingdom. Nevertheless, Spain has conditions for digital development which place it above the European Union average, including excellent digital infrastructure, dynamic companies, good training and research centres and a public sector which leads in terms of its use of electronic administration, all of which are favourable conditions for digital entrepreneurship.

Moreover, in this new phase, the government has increased the political importance of the digital transformation and will align efforts to make Spain a point of reference in the digital field. For all of those reasons, the objective has been set of increasing digital entrepreneurship in Spain, both on the part of national companies and by attracting entrepreneurs from other parts of the world.

○ Promoting the international presence of national digital entrepreneurship

Although the percentage of Spanish start-ups with an international presence (80%) is reasonable, the goal is to increase that figure and increase the revenue achieved by those companies internationally (currently only 37% of them report overseas revenue).

○ Strengthening the private capital sector in Spain for start-ups

Over recent years, the Ministry of Economic Affairs and Digital Transformation, through the Instituto de Crédito Oficial (a state-owned lending institution), has made a significant effort to strengthen the private capital sector in Spain. Nevertheless, it is necessary to continue making progress in this area, increasing the number funds and private investors investing in start-ups, both at the early stages and at the growth and expansion stages, as well as increasing the number and size (in amount) of investments in both start-ups and scale-ups.

○ Attracting teleworkers from the rest of the world

The creation of a favourable environment for companies and start-ups in Spain must serve to attract an ever greater number foreign workers and entrepreneurs from all over the world to our country, to get established and work remotely, regardless of where their companies are located; and, likewise, it must allow employees from different parts of the world to work for Spanish companies.

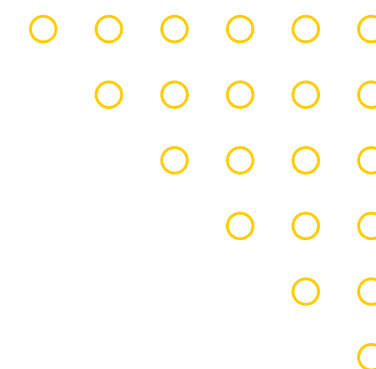
In that regard, Spain is uniquely positioned to become a global teleworking hub; an international centre attracting highly-qualified professionals who do their work remotely, using teleworking processes and tools, in reliable and secure environments, with a high quality of life, as is the case in Spain.

MEASURES

26. PLAN TO PROMOTE THE DIGITALISATION OF SMEs

The aim of the Plan to Promote the Digitalisation of SMEs is to accelerate the processes of digitalising SMEs, promoting the adoption of new technologies in their production processes and the intensive use of data, contributing to and reinforcing the different actions initiated³³ by the different competent actors involved, in order to increase the efficiency and impact of the actions as a whole.

³³ www.plataformapyme.es



The plan will contribute to the implementation of the digitalisation axis of the government's 2030 Strategic Framework for SME Policy and will take advantage of the governance structures of that framework (National Board for SMEs). Moreover, the plan will be aligned with the European strategy for SMEs in pursuit of a sustainable and digital Europe³⁴. The design and implementation of the plan will be done in close cooperation and collaboration with the competent bodies for digitalisation and SMEs.

The plan proposes to focus the actions on both (1) high added-value cross-cutting measures offering economies of scale and efficiencies in the use of public funds, in order to tackle structural situations which hold up the digitalisation of the country, and (2) the development of capacities and instruments with which to contribute to, complement and accelerate the different sectoral initiatives in relation to digital transformation.

To that end, among other actions, it will be fundamental to rationalise and promote an efficient network of capacities and infrastructures for digital innovation, examples of which include the Agrupaciones Empresariales Innovadoras (Innovative Business Clusters), the Digital Innovation Hubs and the Digital Transformation Offices of the Acelera PYME programme, among others, coordinating this measure, at all times, with the National Office for Entrepreneurship (Oficina Nacional de Emprendimiento: ONE), to ensure that there are synergies between digitalisation and digital entrepreneurship programmes.

It will also be necessary to rely on programmes and initiatives such as Acelera PYME, Activa Industria 4.0 and the Plataforma Comercio Conectado (Connected Commerce Platform), in order to ensure the overall efficiency of all of the actions and programmes placed at the disposal of SMEs, seeking synergies and economies of scale for better management of public funds and greater impact. To achieve that, it will also be fundamental to strengthen the existing instruments for financial support and support in relation to taxation, as well as to design and coordinate highly segmented awareness-raising and sensitisation actions.

27. Acelera PYME

The Acelera PYME programme includes a number of measures, done in public-private collaboration, to support the process of digitalising and modernising SMEs in every sector of the economy, with the aim of helping to maintain their economic activity in the short term and improving their productivity in the medium term.

The programme is made up of different initiatives with a triple objective: (1) accelerating the process of digitalising SMEs by means of advice and training; (2) establishing measures to support the creation of technological solutions for the digitalisation of SMEs; and (3) introducing financial support measures.

The principle lines of action are digital talent, digital transformation, artificial intelligence and enabling technologies, data economy and digital content, and entrepreneurship.

28. ONE (National Office for Entrepreneurship)

The National Office for Entrepreneurship (Oficina Nacional de Emprendimiento: ONE) takes the form of a virtual platform which acts as a meeting point, drawing together endeavours and serving as a reference point for newly created SMEs, companies and the self-employed, for everything relating to digital entrepreneurship. The ONE aims to become an umbrella for the existing entrepreneurship support networks in Spain, acting in a coordinated manner and in collaboration with the network of entrepreneurial assistance centres (Puntos de Atención al Emprendedor: PAE), currently managed by the Ministry of Industry, Tourism and Trade.

ONE will carry out actions to set up platforms, generate content, revitalise ecosystems, organise functions and events, and manage aid programmes, among others. In that way, it aims to provide a platform, in the area of services to companies and digital entrepreneurs, which can also be used by any PAEs which consider it necessary.

29.. START-UPS ACT

Culmination of the passage of the Start-ups Bill, with measures recognising the specific form of entrepreneurial initiatives and facilities of this kind, including tax and social incentives to attract investment and talent.

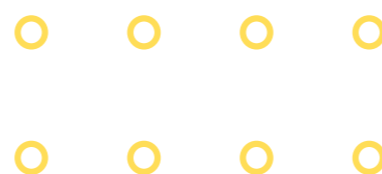
The purpose of the future Start-ups Act is to create a regulatory framework which not only facilitates the creation of new start-ups and boosts their growth, but also makes Spain a favourable place, so that investors and European start-ups choose our country as place to establish themselves. The aim, thereby, is to promote a strong digital entrepreneurship ecosystem, which is highly innovative and which generates stable, high-quality employment.

The Act will also promote entrepreneurship in the area of science, addressing its specific needs, such as those relating to the work of researchers in companies linked to the academic and research fields and the transfer of intellectual property rights arising in those companies

To that end, the Act must contain measures relating to tax (stock options) and social security, aimed both at the start-ups themselves and at investors, to make it easier to attract investment from outside Spain. Equally, it must contain measures to develop venture capital and private equity funds and business angels in Spain. Attracting foreign talent, from the creation of a start-ups visa to the digitalisation of certain procedures associated with the identification of foreign investment companies and the formalisation of investments, are other measures which the Act must provide for.

The Act will take into account the initiatives relating to emerging companies contained in the European strategy for SMEs of 10 March 2020. And it will also take into account the experience accumulated since the passage of Law 14/2013, on entrepreneurs and their internationalisation. Furthermore, the Act will be implemented in close coordination with the different ministerial departments and actors involved.

³⁴ <https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:52020DC0103&qid=1584954599136&from=ES>



30. NATIONAL ENTREPRENEURSHIP PROGRAMME TO SUPPORT DIGITAL ENTREPRENEURSHIP AND START-UPS

The programme includes various actions, aligned with the Estrategia España Nación Emprendedora (Spain Enterprising Nation Strategy), aimed at: (1) promoting digital entrepreneurship in Spain, in particular through the National Office for Entrepreneurship; (2) creating a digital entrepreneurship web portal to serve as a means of dissemination and a mechanism for collaboration between actors connected with digital entrepreneurship in Spain; (3) promoting areas connected with the SDGs and combating the gender divide and the problem of population loss in parts of Spain; (4) setting up a forum for discussion with start-ups and other actors from the digital entrepreneurship ecosystem; and (5) improving regulations and their application, as well as the existing programmes for the internationalisation of Spanish start-ups and for attracting foreign capital and talent, to turn Spain into a global hub where entrepreneurs and foreign workers carry out their professional and business activity.

31. MODERNISATION OF THE PUBLIC FINANCIAL ARCHITECTURE FOR SUPPORTING ENTREPRENEURSHIP

Strengthening the instruments for the public financing of digital entrepreneurship and SMEs, by creating a public-private fund which, along with private funds, invests in SMEs and technology start-ups with high potential for growth and job creation. That includes those developing solutions based on artificial intelligence and other enabling digital technologies (such as cloud computing, language and image technologies, the Internet of things, distributed ledger technologies, cybersecurity, and big data and analytics).

Cooperation with the European Investment Fund will be stepped up to strengthen the venture capital ecosystem in Spain and meet the financing needs of companies in the scale-up phase.

The process of modernising the instruments for supporting digital entrepreneurship will be happen in close coordination with the different ministerial departments and actors involved, and, in particular, with the Ministry of Industry, Tourism and Trade and the Ministry of Science and Innovation.

32. PROGRAMME FOR COLLABORATION BETWEEN THE DIFFERENT CENTRES LINKED TO ENTREPRENEURSHIP

This involves designing a strategy to connect the ONE with the centres promoting the digital transformation and entrepreneurship, so that SMEs can access a wide range of solutions for their digitalisation and financing.

The strategy includes mechanisms to create and exploit synergies resulting from collaboration between incubators and accelerators, technology and technological innovation support centres, Digital Innovation Hubs and other public and private centres of innovation and excellence, all in collaboration with the Ministry of Industry, Tourism and Trade and the Ministry of Science and Innovation, and in a manner aligned with the Spain Enterprising Nation Strategy.





7. PROJECTS TO DRIVE SECTORAL DIGITALISATION

The digital transformation can have a significant positive effect on the country's main productive sectors, which presents an opportunity, but also a challenge in terms of leadership and coordination on the part of the government, the autonomous regions, the business sector and social actors.

For that reason, the Government of Spain has made it the seventh objective of Digital Spain 2025 to accelerate the processes of digitalisation of the productive fabric, promoting the intensive adoption of digital technologies and services and the mass use of data, especially in SMEs, helping to improve their growth and internationalisation, and also boosting their capacities for innovation and data-based decision-making, one of the objectives of these projects being that national sectors should benefit as much as possible from the European "data lakes" that drive the European data strategy³⁵, as well as the sectoral initiatives of the Digital Europe programme.

These key projects will make it possible to develop axes of sectoral transformation that constitute a vertical and cohesive dimension compared to the more cross-cutting nature of the different measures of Digital Spain 2025. The projects converge with the measures relating to connectivity, digital skills, cybersecurity, digital transformation of the public sector and business, in particular SMEs, and data economy and artificial intelligence, for which coordination mechanisms will be established to ensure the necessary efficiencies and synergies.

Consequently, the implementation of projects that drive digitalisation in particular sectors is an instrument with a great deal of potential and impact, as the projects are aimed at accelerating a comprehensive transformation of the value chain of various strategic sectors, and they also drive employment, growth, productivity and innovation in the business fabric and in society as a whole, as well as facilitating close collaboration between institutions of different kinds and in different sectors.

Each project will be carried out using a specific plan, which the different ministerial departments and actors involved must participate in designing and implementing, developing governance models to ensure coordination and cooperation, as well as technical monitoring offices.

³⁵ https://ec.europa.eu/info/sites/info/files/communication-european-strategy-data-19-feb2020_en.pdf

These projects are aligned with and will contribute to and complement the strategies, plans, programmes and sectoral actions carried out by the different competent departments involved in the area of digitalisation for the project in question, examples being the Strategy for the Digitalisation of the Food, Agriculture and Forestry Sector and the Rural Environment, the Industria Conectada 4.0 connected industry strategy, the Spanish Science, Technology and Innovation Strategy, the Spanish Circular Economy Strategy, the strategy for sustainable, secure and connected mobility, the plan to promote the tourism sector, the new guidelines of the Spanish Industrial Policy 2030 and the Spanish Urban Agenda.

Notable among the areas with the greatest potential for transformation are:



A digital food and agriculture sector: impetus will be given to the digitalisation of the primary sector and the Spanish agri-food industry, committing to strengthening food safety and traceability, consumer information and the adoption of more productive and sustainable models.



Digital health: towards prediction, personalisation and efficiency: the efficiency, efficacy and quality of the healthcare system will be increased, speeding up information systems and promoting data sharing and interoperability in a secure manner, as well as contributing to the personalisation of the services provided.



Sustainable, innovative and efficient mobility: impetus will be given to transforming the mobility model, in order to make it sustainable, innovative and efficient, meeting the new mobility needs and promoting innovation and multisector collaboration.



Smart tourism: the digital transformation of the tourism sector will be accelerated in order to maintain Spain's competitive leadership in a global market, increasing tourism's contribution to the digital economy and increasing the resilience of the tourism industry, improving health security, sustainability, the quality of public tourism services and the digitalisation and productivity of the tourism business fabric.



Digitalisation as a lever for modernising trade: the competitiveness of the commercial sector, especially SMEs and micro-enterprises, will be boosted through digital transformation, with digital platforms and services for commerce, and the sector's capacity for innovation will also be boosted.



Furthermore, given that the aim is to generate structural impacts on the economy and society as a whole, impetus will be given to projects that drive digitalisation in all of those sectors of the economy where there is the potential for a transformative impact. Similarly, processes that drive digitalisation will be promoted in the different productive sectors, such as expanding electronic invoicing.

Giving impetus to projects that drive digitalisation in key areas of the economy responds to two specific objectives:

○ Leading disruptive change in an inclusive and sustainable manner

Spain must give impetus to major disruptive projects which bring about profound changes, encourage new business models and knowledge sharing and make it possible to transition to sustainable models which increase the country's economic and technological potential and its potential for job creation, especially in the principal sectors of its economy.

○ Focusing digitalisation efforts on key sectors of the economy

Defining and carrying out projects which drive digitalisation in key areas and sectors of the economy identified as having the most potential, in order to bring about structural, sustainable and progressive changes, and to achieve competitive advantages, making the most of the opportunities offered by the technological transformation. Each of the projects will be carried out according to a specific plan, which will complement the sectoral strategies, plans, programmes and actions of the competent departments and actors.

Furthermore, from the regulatory point of view, it will be important to give impetus to controlled testing spaces (sandboxes) which facilitate innovation and can give rise to a greater number of actors on the supply side, safeguarding the regulatory environment from market operators as a whole.

MEASURES

33. A DIGITAL FOOD AND AGRICULTURE SECTOR

The government will give impetus to a key project in the food and agriculture sector, in order to promote its comprehensive digitalisation, improving the link between the consumer and the producer through innovation and technology. It will take into account the diagnostics, strategic objectives, measures and actions of the Strategy for the Digitalisation of the Food, Agriculture and Forestry Sector and the Rural Environment.

The project will, among other actions, envisage production with a focus on productive and logistical efficiency, improving the relationship with the customer and promoting a transformative Industry 4.0. There will also be a commitment to improving traceability, food security and the quality of consumer information, along with measuring and controlling environmental impacts through the use of technology, data interoperability and encouraging entrepreneurship in the region. All of which will contribute to the international promotion of companies and solutions.



34. DIGITAL HEALTH: TOWARDS PREDICTION, PERSONALISATION AND EFFICIENCY

The government will give impetus to a key project for the digital transformation of the healthcare sector, through innovation, research, assistance and patient empowerment, in order to improve the population's quality of life. That project may include three major areas of action: (1) research, to measure and improve health outcomes and design preventative systems; (2) patient assistance, increasing automation and providing the public with tools, so that they are better informed when making decisions; and (3) empowering patients with telemedicine tools, self-diagnosis and greater accessibility.

The actions envisaged also include speeding up information systems, to allow greater data sharing and interoperability in the provision of services, designing health policy strategies and promoting care which is personalised to the needs of citizens.

All of these actions will contribute to the transformation of the National Health System towards a coordinated, interoperable, integrated and multidimensional form of development, developing applications for the whole healthcare ecosystem: public health and epidemiology, clinical practice, healthcare management, universities, research centres and a booming sector of emerging and innovative companies connected with health and lifestyle, with clear synergies between them all.

35. DIGITAL MOBILITY: SUSTAINABLE, INNOVATIVE AND EFFICIENT

The government will give impetus to a project to drive mobility, with the participation of the principal actors involved and having competence in that field in Spain. The project will include meeting needs for sustainable and connected mobility, and its actions may include developing technology coordination, through information management and the incorporation of new technologies, and multisector collaboration (ecosystem of the automotive industry, transport, energy, communications, tourism, logistics, etc.) to incorporate new scalable business models.

36. SMART TOURISM

The government will give impetus to a key project to accelerate the digitalisation of Spanish tourist destinations and their companies, principally SMEs. The objective is to maintain Spain's leading position in tourism, globally, by updating its capacity to compete in a digital market, reducing the digital divide at the base of the sector (destinations and SMEs) and providing the necessary technology tools to allow the tourism industry to develop towards sustainable models.

The project will include developing the technological support of digital platforms for the provision of information and common services based on interoperability, as well as equipping local authorities and SMEs with digital skills. Furthermore, impetus will be given to the development and adoption of tools based on artificial intelligence and the Internet of things (IoT), and also to the creation of a data ecosystem making it possible to adapt the industry's value proposition to market demands and increase the efficiency of local tourism management, adapting tourism-related public services to the number of tourists.

Along with regional and business actors, the project will be carried out in coordination with the Smart Tourist Destination programme and will be consistent with the future Spanish Sustainable Tourism Strategy 2030 and the Spanish Urban Agenda.

37. DIGITALISATION AS A LEVER FOR MODERNISING TRADE

In the context of the Plan for the Modernisation of Trade, the aim is to promote competitiveness in the retail trade sector, through actions based on digital transformation and the capacity for innovation, in particular among SMEs and micro-enterprises. The role of the Trade 4.0 Observatory will also be essential for analysing, coordinating and disseminating the main trends in relation to the Spanish trade sector, serving, in turn, as a forum for proposing and carrying out initiatives in the field of Trade 4.0.

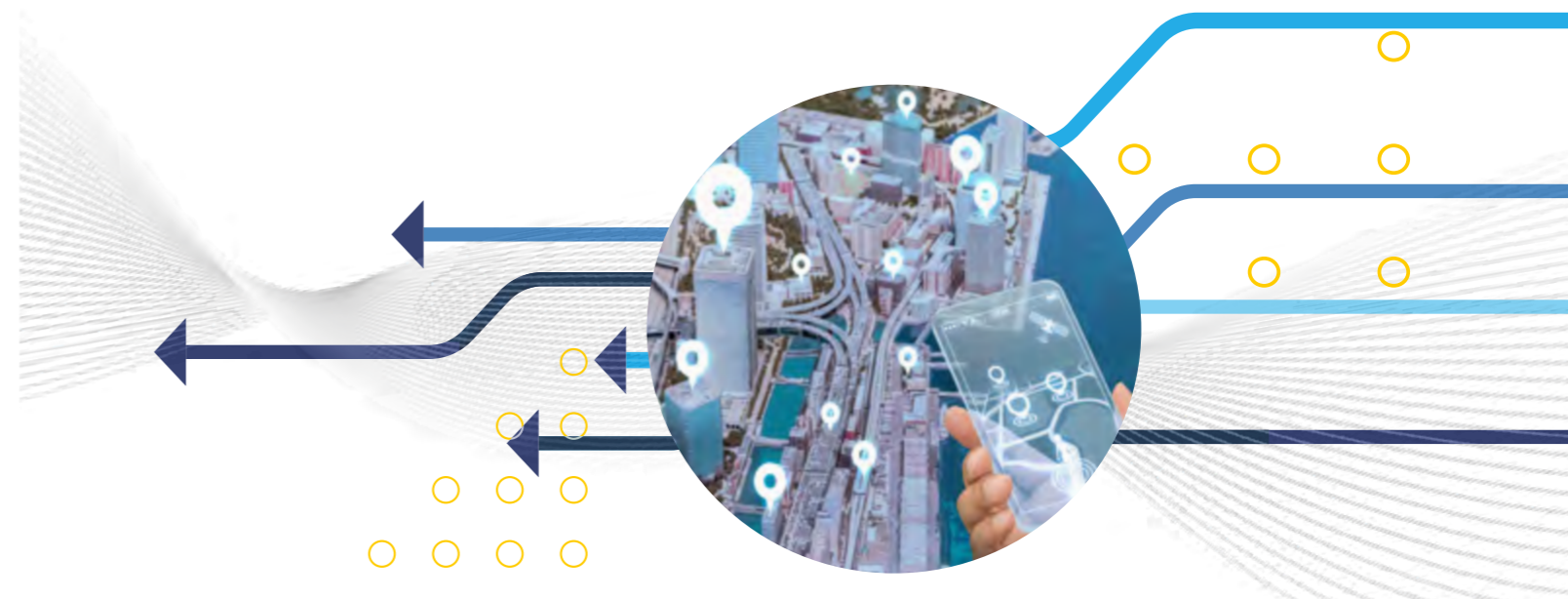
38. LAUNCHER FOR PROJECTS TO DRIVE DIGITALISATION

Impetus will be given to a launcher for key projects, to help to promote other sectoral digitalisation macro projects with significant potential.

Given that the digital transformation of industry is fundamental to competitiveness in Spain and that the use of digital technologies is the key to shoring up existing infrastructure and attracting investors, impetus will be given to projects to digitalise the industrial sector, in line with the Connected Industry 4.0 Strategy, with the aim of tackling industrial modernisation from a comprehensive perspective. Similarly, attention will be paid to areas with high growth potential, including at the European level, such as the semiconductor and microelectronics industry and the quantum communications sector.

Other examples of key macro projects are those connected with smart and sustainable cities and regions; the fashion design technology sector; and the construction industry, by incorporating technology and tools for the intelligent digital modelling of buildings (Building Information Modelling: BIM). Moreover, impetus will be given to sectoral technology platforms which can be established at the European level, for example, in the financial services sector.

Furthermore, given the synergies between the two major transitions currently under way - the digital transformation and the ecological transition - impetus will be given to digitalisation processes (e.g. smart grids) which contribute to energy efficiency, the decarbonisation of the economy, or the circular economy, in a manner aligned with the Integrated National Energy and Climate Plan 2021-2030 and the Spanish Circular Economy Strategy 2030.



8. SPAIN MAGNET FOR INVESTMENT AND TALENT IN THE AUDIOVISUAL SECTOR



The audiovisual sector has developed dramatically in recent years. It has been transformed into **strategic activity from the economic perspective and, at the same time, into a powerful vehicle for representing cultural diversity and transmitting values, as well as being widely consumed by all of us for leisure and entertainment.** The pandemic caused by COVID-19 has drawn attention to those last virtues of the audiovisual sector, whose different products and forms have played an important role by offering the public numerous and varied alternatives in terms of entertainment, providing relief during lockdown.

The state of the audiovisual sector prior to the pandemic was the result of years of work and effort. Promoting and motivating the sector's members by making audacious audiovisual proposals, the essential investment by other actors in those proposals, the valuable collaboration of new entrants to the sector and its orientation towards consumers of audiovisual content, and also, lastly, the support of public institutions at every level, have translated into the **prominent position enjoyed by the Spanish audiovisual sector internationally.**

The situation caused by COVID-19 and the need to implement public policies which make it possible to return to economic growth have opened a window of opportunity. It will be necessary to dedicate more effort to those aspects which public administrations can support, incentivise and promote, so that the overall result is that Spain **is established as a outstanding platform, internationally, for attracting production, business and investment in the audiovisual sector,** based on the good work of the sector's professionals in Spain.

The plan for Spain to be a magnet in the audiovisual sector will be flexible and dynamic, in order to be able to adapt the solutions and actions to the demands of national companies and of international companies and investors. The plan will have two specific objectives:

○ **Attracting foreign investment and turning Spain into a magnet for the audiovisual sector**

The government needs to convey to the sector that Spain is a country which is competitive in terms of talent, locations and auxiliary services for its activity, and actions need to be taken which publicise the comparative advantages of carrying out audiovisual production in Spain. The objective is the immediate reactivation of the industry and to attract foreign investment, allowing high-quality jobs to be created throughout the value chain of the audiovisual sector.

○ Reducing audiovisual production costs and improving competitiveness (financial, tax and legal costs)

The plan will introduce measures to tackle one of the traditional weaknesses of the sector: the difficulty of accessing credit, due in large part to the scarcity of assets which can be provided as security, and the lack of continuity in this activity. In the area of taxation, audiovisual production in Spain competes with the tax advantages offered by competitor countries. Similarly, regulatory burdens are analysed by investors as one of the elements to be assessed before choosing where to locate their investments. In order to overcome these particular obstacles for the sector, a number of actions, coordinated between different actors, is proposed.

MEASURES

39. GENERAL AUDIOVISUAL COMMUNICATION SERVICES BILL

Reform of Law 7/2010, the General Audiovisual Communication Act, as a result of the transposition of Directive (EU) 2018/1808, beginning its passage through the Spanish parliament in 2020. The aim of the reform is to create a flexible regulatory framework which makes it easier to attract investment in the Spanish audiovisual sector and reduces administrative burdens as far as possible. This point is particularly important in relation to the obligation to promote European audiovisual works, since, based on the objective of supporting the European audiovisual sector on equal terms (ensuring a level playing field), it is deemed that there should be flexibility and simplification according to the size of the company and its business model.

40. SPAIN AUDIOVISUAL HUB PLAN

With a view to strengthening the competitiveness of Spanish audiovisual production and its internationalisation, at the same time as increasing Spain's attractiveness as a destination for investment and economic activity linked to audiovisual production by foreign companies, the government will adopt a plan which, among others, will include the following measures:



International promotion instruments for the audiovisual sector

Strengthening the instruments for official support for internationalisation, promoting cover for the risks connected with international projects linked to the audiovisual sector. Particular emphasis will be placed on technology companies and innovative companies linked to the audiovisual sector



Digital service point for permits at consular offices

The location of production projects in Spain is often hindered by the difficulty which the professionals needed for the relevant production, from the project's country of origin, have in coming to Spain to work on it. A pilot project will be undertaken to digitalise 11 consular offices, with the aim of speeding up the administrative procedures necessary to grant the permits and authorisations necessary for those professionals to come to Spain with assurances.



Simplifying requirements and ensuring a level playing field

The transposition in Spain of the above-referenced directive will allow the requirements for operators of different platforms and channels to be aligned, as well as a major simplification of the different existing requirements, with the aim of encouraging national and foreign investment, to give impetus to a competitive and innovative audiovisual sector in our country.



Tax incentives

Tax-related support measures are also an important element in the comparative analysis carried out by audiovisual investment entities when deciding where to locate their projects. The Spanish fiscal framework relating to such activities has recently been improved, with the approval of the first final provision of Royal Decree-Law 17/2020. Now it is necessary to make potential investors aware of those advantages. To that end, the new system of tax incentives for the audiovisual sector will be publicised, in coordination with ICEX (the Spanish Institute for Foreign Trade), the State Secretariat for Global Spain and the ICAA (the Spanish Institute for Cinematography and the Audiovisual Arts).



Funding measures

One of the weaknesses of companies in the audiovisual sector is the difficulty they have in accessing sufficient funding. Royal Decree-Law 17/2020 approved the direct grant of two subsidies to the company Audiovisual Fianzas SGR, so that it can provide guarantees allowing companies in the audiovisual sector to access credit amounting to 780 million euros, as well as direct aid for cinemas. Consideration will be given to complementing these measures with other lines of support, in collaboration with the ICO, the General Secretariat for Industry and ENISA, Red.es or the ICAA.



9. ECONOMY AND ARTIFICIAL INTELLIGENCE

Data are central to the great transformations which digital technologies are bringing about in the world today. The amount of data generated by companies, public administrations and citizens is growing exponentially, year after year. The volume of data generated in the world in 2018 was calculated at 33 zettabytes and it is estimated that it will be 175 zettabytes in 2025. The way in which they are processed is also changing. Today, 80% of data processing and analysis is carried out in large data centres using massive data processing or high-performance computing (HPC) technologies, digital enabling technologies (DETs) in which Europe is still lagging behind. In 2025, that proportion is expected to be inverted, which opens up a great opportunity for European companies to develop the tools necessary to increase their control over their own data³⁶, in line with the European data strategy recently approved by the European Commission.

Most of data's potential has yet to be exploited, both in Europe and in Spain. There are various reasons why the full potential of data has not yet been realised, but they have to include (1) the absence of an adequate regulatory framework offering certainty regarding the use which all actors can make of the data; (2) the absence of adequate cooperation frameworks for sharing data between sectors and between the private sector and public administrations; and (3) the limited transparency in the regulation of ownership rights in this area.

The solution to a large part of these problems, especially those connected with regulatory matters, is only feasible at the European level, which is why Spain is supporting the European initiatives in this area and participating actively in them. Other aspects, more closely related to the creation of a data ecosystem and to public-private collaboration mechanisms, are, clearly, a national responsibility, where each country can benefit from a good system of European cooperation, but which requires major national involvement.

Artificial intelligence is one of the technologies which is developing fastest around the world, in part due to the huge proliferation of data. Its scope of application is growing all the time: healthcare, agriculture, protecting the environment, improving production systems, design, cybersecurity and many other applications, increasing in number day by day, also make it one of the major alternatives for solving a great many of the problems facing us collectively. However, its extreme versatility is also a potential source of risk (discrimination caused by biased datasets; automated decisions which are difficult to understand; intrusion into individuals' private lives; or use for criminal purposes), if certain rules are not respected.

³⁶ Communication "A European strategy for data". February 2020. European Commission https://ec.europa.eu/info/files/communication-european-strategy-data_en

Consequently, the European Union considers the development of AI “made in Europe” as an unavoidable necessity and an unbeatable opportunity to tackle some of the major challenges of the immediate future: increasing productivity and economic growth, environmental sustainability, improving democracy, health, and the provision of high-quality public services. To that end, in 2018 it drew up a strategy and a coordinated plan for AI and in February 2020 it published a White Paper on Artificial Intelligence³⁷, with the aim of making progress towards the construction of a European AI ecosystem, convinced that an integrated European approach is necessary to achieve sufficient scale and avoid fragmentation in the single market.

The European proposal, shared by Spain, is based on the creation of an ecosystem of excellence for the data economy and AI, which combines the efforts of the EU, the Member States and the regions, as well as the private sector, throughout the value chain - research and adoption by companies, including SMEs and public administrations, combined with the creation of a trusted ecosystem, based on a Europe-wide regulatory framework for AI with a human-centred approach.

In 2019, the Government of Spain approved the Spanish strategy for artificial intelligence R&D+i³⁸, aligned with that of Europe, and it now considers it necessary to draw up a National Artificial Intelligence Strategy which places Spain among the leading countries in terms of research into and the use of reliable AI in the service of economic and social development. The strategy is conceived as a commitment between the Spanish public, private initiative and the public sector, aligned with European principles, respectful of shared values and which helps to improve: (1) the productivity of the private sector; (2) people’s living conditions; (3) the provision of more efficient public services; and (4) dealing with some of the major challenges facing our society today, such as the environment, mobility and ageing.

In short, artificial intelligence has the potential to tackle some of the main challenges facing the contemporary world and, as fundamental basis for technological and business innovation, it is a means of transforming our society. In that regard, training in the field in higher education will be fundamental and must be addressed from three fundamental perspectives. First, updating university courses in order to modernise and update training in the processes for generating new knowledge in the field, overcoming disciplinary barriers beyond the scope of technical training courses. Second, encouraging universities not to focus training and research in artificial intelligence exclusively on obtaining short-term results, thus combining an interest in mature technologies with generating the knowledge necessary for future technologies. And, lastly, facilitating the transmission of knowledge from universities to society as a whole. In relation to the data economy and artificial intelligence, Digital Spain 2025 establishes four specific objectives:

○ Making Spain a reference point in the transformation towards a data economy

The exponential growth of the data produced in the world and the changes in how those data are processed open up opportunities for countries such as Spain to occupy a leading position in the data economy. This transformation also requires responsible management, which implies a strong commitment by the public sector to continue increasing the openness of public data, the creation of strong mechanisms for collaboration between the public and private sectors, the public promotion of data sharing and the development of lighthouse projects for using both public and private data for the common good, and the existence of companies with extensive experience and with the desire to develop public-private collaboration experiences in this field, as decisive instruments for achieving the stated objective.

○ Promoting artificial intelligence as an engine for innovation and social, inclusive and sustainable economic growth

For artificial intelligence to bear fruit, it is necessary for the results of the research to be adopted by companies, public administrations and the public, in order to improve their productivity and increase their well-being. Since 2019, Spain has had a national R&D+i strategy for artificial intelligence. Now is the time to complement that strategy with another, comprehensive, strategy, with a broader objective: the integration of the whole value chain in a shared project which serves social, inclusive and sustainable economic growth.

○ Developing an ethical and legal framework for AI based on shared values

Spain shares with the EU the conviction that a homogeneous ethical and legal framework is necessary for the whole Union, based on shared values, which places AI at the service of people. That framework will be incorporated into the Charter of Digital Rights, already envisaged in Digital Spain 2025, although, given its particular weight and the problems posed by the accelerated development of AI, it will require special treatment.

○ Preparing Spain for the socio-economic transformations which AI will bring about

The extent of AI’s use in companies and public administrations will bring about major changes in the country’s employment structure, which must be prepared for collectively. The search for solutions so that there is a fair and equitable distribution of the benefits of that transformation and to prepare people so that they can achieve the best possible outcomes in the new scenario is incumbent on all public authorities.

○ Strengthening competitiveness through R&D in digital enabling technologies (DETs) as a whole

In every sector of the economy and of society, new processes of digital transformation are emerging, for which Spanish technology companies must not only be prepared, but rather they must be the ones that lead them, exerting a pull effect on the other sectors.

³⁷ White Paper on Artificial Intelligence: a European approach to excellence and trust. Febrero 2019. Comisión Europea. https://ec.europa.eu/info/files/white-paper-artificial-intelligence-european-approach-excellence-and-trust_en

³⁸ Spanish Strategy for Artificial Intelligence R&D+i. 2019. Ministry of Science, Innovation and Universities. [www.ciencia.gob.es/stfls/MICINN/Ciencia/Ficheros/Estrategia Inteligencia Artificial IDI.pdf](http://www.ciencia.gob.es/stfls/MICINN/Ciencia/Ficheros/Estrategia%20Inteligencia%20Artificial%20IDI.pdf)

For those companies to be better placed to take advantage of the opportunities which present themselves, it is necessary to support and promote R&D activities in all digital enabling technologies (DETs), since they have a high impact and capacity for disruption and are of strategic importance for Spain's development and digital transformation.

Such digital enabling technologies include the Internet of things and 5G communications networks, massive data processing technologies and distributed ledger databases (blockchain), high-performance computing (HPC), fuzzy and cloud computing, edge computing, virtual reality, cybersecurity, micro/nano-electronics and also artificial intelligence.

MEASURES

41. NATIONAL ARTIFICIAL INTELLIGENCE STRATEGY

The government will draw up a National Artificial Intelligence Strategy, which will contain measures to promote the development and adoption of AI in Spain, as well as others aimed at making it more reliable. The strategy will be designed as a "living" strategy, with periodic reviews, so that it can be adapted, in a flexible manner, to the needs and changes which occur in such an evolving technology.

42. DATA OFFICE AND CHIEF DATA OFFICER (CDO)

The government will establish a Data Office within the Central State Administration, which will take advantage of the extensive experience existing within the Administration and optimise the use of existing resources. It will be led by a Chief Data Officer (CDO), who will be responsible for ensuring good governance in the use of public data and for promoting their use by the public and private sectors. The Data Office will be responsible for designing and proposing strategies which allow the public data of the different administrations to be made available to companies and citizens.

Its tasks will include the following: establishing the measures necessary to promote the sharing and use of public and private data; creating environments for sharing the data of the Administration with companies, for sharing their data with the Administration and also for sharing data between companies, securely, and in a manner which is aligned and coordinated with the existing institutions that produce official statistics. It will also be responsible for monitoring European trends in European data and cloud strategies, as well as investing in the creation of sectoral "data lakes" and proposing governance mechanisms.

43. ARTIFICIAL INTELLIGENCE ADVISORY BOARD

This board will be made up of recognised experts in the field of artificial intelligence, who will advise the government on the design and revision of AI policies in Spain, and also on the dissemination of those policies in society and in companies. Mindful of the changes which are going to occur in the world of AI, the board may be organised into whatever working groups it considers appropriate in order to tackle the challenges which, at any given time, are deemed most important, in order to give impetus to an AI ecosystem of excellence and trust in Spain.

44. CLOUD STRATEGY: SHARED EUROPEAN DATA SPACES

The European Commission, with the "European Strategy for Data", has launched the European Cloud Federation initiative, with the aim of coordinating and combining the local initiatives of the Member States, such as GAIA-X and the Nordic and Baltic initiatives.

Spain will play an active role in forming part of the shared spaces of the European Cloud Federation and in promoting an Iberian space, along with Portugal, which will give impetus to the development of advanced data computing technologies: HPC, quantum computing and edge computing, among others, with the aim of becoming a hub for connectivity and, consequently, a potential data infrastructure concentration point.

It is essential to commit to data availability and digital innovation at the European level, and Spain will work to develop alliances in that regard, promoting private investment in data centres and positioning the country as a hub for businesses in the European cloud space.



10. DIGITAL RIGHTS

Digital technologies are making profound changes to our daily life and to the way we relate to other people, to companies and to public administrations: the way we work, our consumption habits and the way we access goods and services to meet our needs; and the way in which companies operate.

According to many analysts, this is only the start. We are at the beginning of a revolution which is changing everything and which opens up a future full of possibilities but also risks. The question we have to ask ourselves is whether our societal rules are adapted to the needs of the moment; whether the ethical and legal framework we have operated within up to now is sufficient or whether it needs adjusting and revising. And, if so, what kind of adjustments does it need. This is a question we are asking ourselves, not only in Spain, but also in Europe and in a large part of the world. Organisations of different kinds - academic, social, business and political - contribute ideas about what must be changed and in what way.

There are proposals which have a bearing on the strength of citizens' rights, including the right of access to the Internet, secure digital identity, training, security and the right to privacy. There are proposals to clarify ownership rights in relation to the data generated when we are browsing and also to avoid profiling based on our browsing habits. Others have more to do with the right to receive truthful information and with respect for freedom of expression.

Others have more of a bearing on trust and protecting the rights de las personas físicas y jurídicas como consumidoras, relacionadas de natural and legal persons as consumers, in connection with the quality of the products, services and information acquired by making use of the Internet.

And yet others deal with how the digital transformation affects employment rights and the rights of companies. In the world of work, the debate is taking place around the right to disconnect outside working hours; protecting privacy at workstations; training and the use of digital systems at workstations; and clarifying new ways of working - and the employment relationships they entail - emerging as a consequence of the digital transformation of many companies.

Companies, for their part, are calling for guarantees with regard to access to and the neutrality of networks and digital systems; the quality of such services; and the precise demarcation of responsibilities in a digital world.

Addressing these concerns requires a collective effort, both in Spain and in the European Union.

Strengthening citizens' rights in a digital world, respecting our shared values, is essential in order to achieve decisive support for digital development in Spain and in the European Union. Clarifying the rights and obligations of companies is fundamental for companies and administrations to be able to make use of all of their creativity and capacity, while minimising risk, in a scenario which, by its nature, is already full of uncertainty.

Passing the conclusions of all of those reflections and the relevant national and international agreements into national law is the purpose of the Charter of Digital Rights, which **will update and modernise the formulation of the rights and obligations of citizens, companies and public administrations**; it will guarantee respect for shared values and eliminate uncertainty regarding what can and cannot be done in a digitalised world, in which almost everything is possible; and it will define the bases for what we understand, collectively, to be fair rules for common development in this new scenario. That constitutes the tenth and final objective of Digital Spain 2025.

To that end, Digital Spain 2025 defines three specific objectives in relation to rights in the digital era:

Strengthening the rights of citizens in the digital world

The aim will be to develop new rights which respond to the changes occurring in the economy and society due to technological development, and where there are no rules which can be applied directly to the resolution of cases which the legal system has to decide on. Furthermore, individuals will be guaranteed the resources to be able to "live" in such digital spaces, which will, on occasions, require the recognition of new rights that provide the resources necessary to cope in those environments.

At times, those rights may be interpreted as a simple extension of rights which are already recognised in the non-digital world, but, at other times, that transfer is not easy to carry out and is subject to multiple interpretations, which need to be clarified from a legal perspective. The preparation of the new General Telecommunications Act will help with this objective.

Providing certainty regarding the actions of companies, individuals and public administrations in using technologies

The rapid development of new goods and services based on the use of digital technologies has been supported, in part, by the absence of strict regulation. However, at times, that has been interpreted, by some, as a licence to do in the digital world what was not permitted in the physical world and, by others, as a limitation permitting anything that was not explicitly prohibited.

If, in principle, the absence of regulation was necessary to encourage innovation, now that digital services are mature and there is more awareness of the advantages and risks resulting from their use, it is necessary to review the initial situation, to give companies,

individuals and public administrations greater clarity regarding what is and what is not permitted.

Increasing public trust in the use of digital technologies

Trust is essential in order to promote the use of digital technologies. Clearer demarcation of rights and certainty that society's shared values are respected is the only way to strengthen that trust and, consequently, give impetus to the use of such technologies. Moreover, the insistence on promoting usability, based on elements used daily and securely by the Spanish public, will help to strengthen trust in digital services.

MEASURES

45. CHARTER OF DIGITAL RIGHTS

The preparation of a Charter of Digital Rights, which formulates, in contemporary language, the rights of citizens and companies in the digital world, eliminating uncertainty regarding the interpretation of certain principles and guaranteeing the availability of the resources necessary for everyone to be able to develop fully in a digital world.

The Charter of Digital Rights will contribute to reducing the digital divides which have grown wider, in recent years, for socio-economic, gender-based, generational and geographical reasons. In particular, the implementation of the right of access to a high-quality Internet service, accessible throughout the country, along with training, qualifications and the development of digital skills in every sector of the population, especially among the most vulnerable groups, will be fundamental in combating digital divides and providing the country with territorial cohesion.

46. DIGITAL FUTURE SOCIETY

Digital Future Society (DFS), an initiative promoted by the Government of Spain's Ministry of Economic Affairs and Digital Transformation and Mobile World Capital Barcelona, aims to build a fairer and more inclusive future in the digital era, to improve the impact of technology on society.

With that aim, DFS connects institutions, corporations, civic organisations and academia, in order to generate debate, share knowledge, create solutions to the challenges presented by digital progress and make them available to the public. Digital Future Society works in four key areas: public innovation; trust and digital security; equitable growth; and inclusion and empowerment of citizens.

The actions included in the project are, first, the think tank, as a transnational initiative aimed at commissioning and interconnecting research, exchanging knowledge and supporting the complex ethical and legal challenges, and challenges relating to inclusion, arising from the design, use and governance of digital technologies.

Second, the Civil Lab, the aim of which is to identify existing digital transformation solutions, or to help to create them, in response to the social challenges described by the think tank.

Third, empowerment of citizens and regional impact, which seeks to make contact with society and social actors, in order to make them aware of the results of the programme and discuss the challenges and solutions within the relevant region. And, fourth, holding international events, such as the Digital Future Society Summit.

47. PARTICIPATION IN EUROPEAN INITIATIVES AND INTERNATIONAL DEBATES ON DIGITAL RIGHTS

Participation in the main initiatives and international governance forums regarding fundamental rights and their protection in the digital sphere, such as the “Roadmap for digital cooperation and application of the recommendations of the High-Level Panel on Digital Cooperation” of the United Nations, relating to human rights, the “Contract for the Web” of the W3C Consortium, as well as the committees and forums for the protection of the rights of minors on the Internet, and those on privacy and protection from harmful content online, of the European Commission, the Council of Europe and the OECD.

48. MODERNISATION OF THE REGULATORY FRAMEWORK APPLICABLE TO REMOTE WORKING

The government is already working on the framework for the Social Dialogue in a specific piece of draft legislation, with the aim of providing a framework of legal certainty which allows remote working, as a means of corporate organisation that promotes productivity and efficiency, to take place, while ensuring that workers’ rights are protected faced with the new reality brought about by the new technologies.

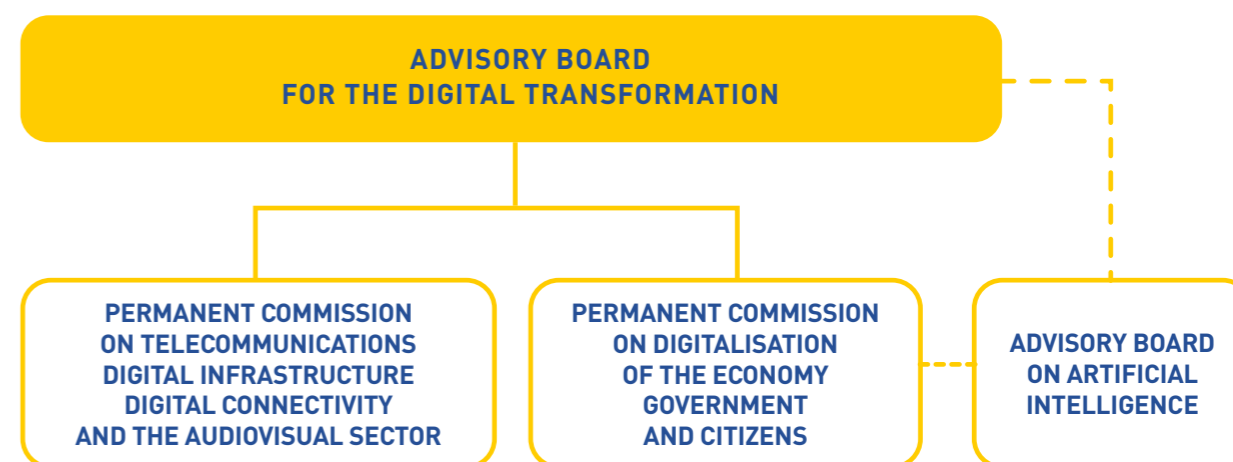


The success of Digital Spain 2025 will require the collaboration of all of the actors involved in the measures envisaged in it. It is necessary to combine efforts and align commitments, develop an effective structure for coordination between the different levels of government and develop a structure for participation which reflects all of the groups and individuals at which the measures are aimed. Equally, the necessary monitoring, evaluation and review mechanisms must be established, in order to make it easier to adapt the measures to the future evolution of our society and our economy, as well as the appearance of new technological paradigms and business models. For all of that, it is necessary, in short, to have **an adequate governance mechanism, based on transparency, participation and collaboration, and with appropriate leadership.**

The Government of Spain will create a public-private board to facilitate adequate dialogue and multisector participation between the different actors implicated in the country's digital transition: the **Advisory Board for the Digital Transformation**, which will be the product of reactivating and updating the former Advisory Board on Telecommunications and the Information Society (Consejo Asesor de Telecomunicaciones y para la Sociedad de la Información: CATSI). The Advisory Board for the Digital Transformation will thus provide a suitable and renewed forum for the economic operators and social actors connected with the matter to take part in. The Artificial Intelligence. Advisory Board will act in coordination with this new board

GOVERNANCE OF DIGITAL SPAIN 2025

The Advisory Board for the Digital Transformation will provide advice and help to disseminate the actions defined by Digital Spain 2025, and it will be organised into **plenary sessions and commissions**. In particular, two permanent commissions will be created to tackle, in a more focused manner, the actions relating to two different axes and measures of the agenda: (1) the Permanent Commission on Telecommunications, Digital Infrastructure, Digital Connectivity and the Audiovisual Sector; and (2) the Permanent Commission on Digitisation of the Economy, Government and Citizens.



Furthermore, there are a number of measures in Digital Spain 2025 which envisage the development of **sectoral plans** (e.g. the Plan for Connectivity, the Plan to Attract Cross-Border Digital Infrastructure, the Strategy to Promote 5G Technology, the National Digital Skills Plan, the Plan to Promote the Digitalisation of SMEs, and plans for the development of key projects, etc.). The Ministry of Economic Affairs and Digital Transformation will be responsible for giving impetus to and co-leading those sectoral plans, in cooperation with the different actors having joint responsibility: competent ministries, different levels of government, business associations, unions and other economic and social actors.

Moreover, the Ministry of Economic Affairs and Digital Transformation will convene the appropriate **inter-ministerial coordination committees** with other ministerial departments and public bodies of the Central State Administration. Coordination with other **administrations, autonomous regions and local authorities**, with regard to the implementation of Digital Spain 2025, will be done through the relevant sectoral conferences.


With regard to **monitoring**, the National Telecommunications and Information Society Observatory (Observatorio Nacional de Telecomunicaciones y Sociedad de la Información: ONTSI) will contribute, providing public information relating to digital transformation and supporting the preparation of reports for the evaluation and updating of the actions carried out as part of this agenda. In addition, a website dedicated to Digital Spain 2025 will be set up, containing up-to-date information on measures and indicators, and an annual report will be prepared, which will be submitted to the Advisory Board for the Digital Transformation.

ANNEX I. MEASURES FOR DIGITAL SPAIN 2025



AXIS	MEASURE		
1. DIGITAL SPAIN 	1 Digital Connectivity Plan 2 General Telecommunications Bill 3 Plan to attract cross-border digital infrastructure		
	2. PROMOTING 5G TECHNOLOGY 	4 Releasing the second digital dividend in 2020 5 Allocation of the priority frequency bands required for 5G in 2021 6 5G pilots and new measures to promote the deployment and adoption of 5G 7 Regulatory proposal for 5G cybersecurity 8 Development of 5G transport corridors 9 Leadership in European projects for innovation in new generations of mobile technology	
		3. DIGITAL SKILLS 	10 Educa en Digital 11 National Digital Skills Plan 12 Uni-Digital Plan
4. CYBERSECURITY 			13 Cybersecurity helpline 14 Strengthening the cybersecurity of citizens, SMEs and professionals 15 Promoting the business ecosystem of the cybersecurity sector 16 Promoting Spain as an international hub in the field of cybersecurity 17 Deployment and operation of the cybersecurity operations centre
			5. DIGITAL TRANSFORMATION OF THE PUBLIC SECTOR

ANNEX II. GOALS FOR DIGITAL SPAIN 2025

AXIS	MEASURE
6. DIGITAL TRANSFORMATION OF BUSINESS AND DIGITAL ENTREPRENEURSHIP 	26 Plan to promote the digitalisation of SMEs 27 Acelera PYME 28 ONE (National Office for Entrepreneurship) 29 Start-ups Act 30 Spain Enterprising Nation Programme to support digital entrepreneurship and start-ups 31 Modernisation of the public financial architecture for supporting entrepreneurship 32 Programme for collaboration between the different centres linked to entrepreneurship
	33 A digital food and agriculture sector 34 Digital health: towards prediction, personalisation and efficiency 35 Digital mobility: sustainable, innovative and efficient 36 Smart tourism 37 Digitalisation as a lever for modernising trade 38 Launcher for projects to drive digitalisation
	39 General Audiovisual Communication Services Bill 40 Spain Audiovisual Hub Plan
	41 National Artificial Intelligence Strategy 42 Data Office and Chief Data Officer (CDO) 43 Artificial Intelligence Advisory Board 44 Cloud strategy: common European data spaces
	45 Charter of Digital Rights 46 Digital Future Society 47 Participation in European initiatives and international debates on digital rights 48 Modernisation of the regulatory framework applicable to remote working

GOAL	2020 ³⁹	2025 ⁴⁰
1 Coverage for the population of more than 100 Mbps	89%	100%
2 Spectrum ready for 5G	30%	100%
3 People with basic digital skills ⁴¹	57%	80%
4 More specialists in cybersecurity, AI and data	-	20.000
5 Public services available on mobile apps	<10%	50%
6 Contribution of e-commerce to SMEs	<10%	25%
7 Reduction in CO2 emission due to digitalisation	<10%	10%
8 Increase in audiovisual production in Spain	-	30%
9 Companies using AI and big data	<15%	25%
10 National charter of digital rights	NO	SÍ

³⁹ Baseline in 2020, estimated on the basis of numerous studies (source: ONTSI, DESI)

⁴⁰ 2025 Goals, to be implemented and completed with input from the Advisory Board for the Digital Transformation

⁴¹ Half of these population percentages trained in basic digital skills must be women

ANNEX III. SWOT ANALYSIS OF THE STATE OF SPAIN'S DIGITAL TRANSFORMATION

In tackling the design of a digital agenda, we need to know both our starting point and where we want to get to. A necessary exercise is to identify the strengths, weakness, opportunities and challenges which are present for Spain in the digital environment

Among our most important strengths are good connectivity and technological infrastructure; an optimal environment for the roll-out of networks and development of the market for services based on 5G; and our supercomputing facilities, which are among the fastest and have a computational capacity which is among the highest in Europe, at the Barcelona Supercomputing Center⁴².

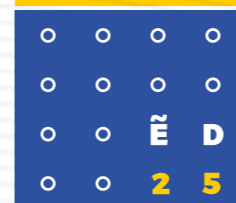
We have universities which are strong in the area of technology and in certain other cutting-edge specialisms⁴³, and we have a dynamic and talented society which is capable of adapting to innovations, highly customer-oriented and where the citizens are protected by the rule of law.

We also have a very good level of electronic administration and digital public services (tax authority, social security, etc.), although sufficient progress has not been made in recent years in applying new technologies to managing information and implementing public policy (e-government). In addition to that, there is the challenge of a federal structure, when it comes to ensuring the integrity and security of the system and achieving sufficient scale to make investment profitable and maximise synergies.

We also have important productive sectors, which represent a great opportunity to carry out specific digital transformation projects (tourism, food and agriculture, mobility, finance, digital content). Having Spanish, as one of the most widely-spoken languages in the world, is a great opportunity for the development of artificial intelligence based on natural language and with applications in all of the Spanish-speaking markets. With regard to weaknesses, from the national perspective, Spain is relatively behind in terms of the population's digital skills, at the basic level, in the workplace and also in terms of ICT specialists (although, given the good number of graduates in STEM subjects, it is also an opportunity), which makes reorientating young people and the unemployed towards those jobs where there is growing demand a formidable challenge. Among our most significant weaknesses is also the heterogeneous nature of our companies, since, alongside highly-digitalised large companies in sectors such as banking and information, there are many micro-enterprises which are a long way from being digitalised (this is particularly important, given that 93% of our companies have less than 9 workers).

⁴² 42 The Barcelona Supercomputing Center – National Supercomputing Centre (BSC-CNS) is the first supercomputer in Spain, the fastest in Europe and the thirteenth fastest in the world. It is a unique instrument, with extraordinary storage and computational capacity. Moreover, it forms part of the Spanish Supercomputing Network, which makes it possible to collaborate with other supercomputing centres and universities in other autonomous regions.

⁴³ 43 Computing and Intelligent Information Systems) department of Granada University (Universidad de Granada: UGR) ranks fourth, globally in artificial intelligence - Times ranking of universities (THE) - and is the main reason why UGR appears among the 300 best universities in the world (of 17,000 assessed) and among the four best in Spain in the prestigious Academic Ranking of World Universities (ARWU or Shanghai index). This research group is the leading group worldwide in fuzzy logic.



To sum up, we are facing major challenges, such as improving human digital capital and attracting transformation to SMEs and micro-enterprises; and promoting artificial intelligence in the service of sectors which are traditionally strong in Spain

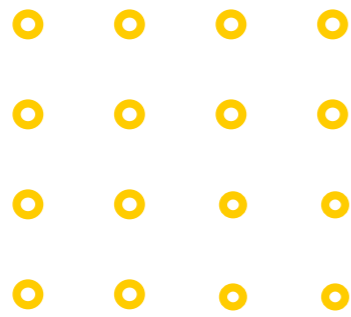
From a more global point of view, Spain is on the front line with regard to the challenges - economic, security-related and political - resulting from the emergence of new technology powers and the disproportionate growth of the revenue and power of digital platforms, as a result of the revolution in the dominant economic model due to the mass commercial exploitation of the data of users of digital services.

In relation to the economy, it is necessary to adapt the global governance framework to the new digital reality, modifying the global framework for taxing multinationals, for sectoral regulation and for the protection of competition, in order to ensure an adequate framework for interaction between companies and also with the public. Moreover, the digital revolution will have an enormous impact on the labour market, with the emergence of new professions and the disappearance of many of the traditional ones, which requires active management of the transition, to avoid part of society being excluded. The regulation of the data economy, network neutrality, leadership in supercomputing, and revision of the regulatory framework, so that services which compete with each other by means of different technologies are treated equally, are some of the matters which will be on the European agenda for the next political cycle.

From the point of view of security, tensions between the great superpowers highlight the importance of building a physical, legal and institutional framework which guarantees the autonomy and integrity of networks and adequate protection of personal and public data. Europe must significantly strengthen its capacity in areas as varied as cybersecurity, certification of equipment, artificial intelligence and combating network manipulation.

Finally, from the political perspective, the dominance of the technology giants of the USA and China in the area of critical infrastructure (cloud, networks, equipment, etc.) requires different options to be considered, so that Europe can guarantee its autonomy and security in its own territory, the privacy of its citizens and the proper functioning of democratic systems. The possible fragmentation of the Internet, the development of a secure, European, public cloud, the application of competition rules to the digital giants, the protection of data and the rights of citizens and the regulation of artificial intelligence are some of the matters that world leaders are going to have to deal with in the coming years.

These matters already have a significant bearing on the current situation and they will, without doubt, determine the political agenda of the new European Commission. Given their impact in Spain, our country must strengthen its capacity to play a proactive role in defining the European responses.



STRENGTHS

High-quality Infrastructure (7/28 DESI)

- Fibre optic roll-out (1/28 EU)
- Superfast broadband coverage (7/28 DESI) 5G
- 5G availability (9/28 DESI)
- Barcelona Supercomputing Centre
- Transport infrastructure (7/39 WEF)

Digital Public Services: (2/28 DESI)

- Open data (2/28 DESI) (7/31 OECD)
- Digital Healthcare Services
- Electronic administration (3/39 WEF, BM)

Digitalised Major Companies

Smart cities

Of 165 cities in the global ranking, the USA has 14 and Spain 12

Science

- High number of graduates in STEM
- Subjects Strength in scientific production

Cybersecurity

- Secure servers (8/39 OECD)
- 5th country in the EU and 7th in the world (ITU 2019)

WEAKNESSES

Human Capital (16/28 DESI)

- Basic digital skills (14/28 DESI)
- ITC specialists (20/28 DESI)
- Internet in schools (36/39 WEF)
- Little capacity to attract talent
- Lack of use due to lack of interest or lack of knowledge

SMEs

- 93.6% micro-enterprises (0-9 employees)
- Low adoption of technologies by micro-enterprises (31% with website, 25% without Internet)

I+D

- Low levels of investment (especially private)
- Few researchers in ICTs
- Modest/moderate innovation

CHALLENGES

SMEs (adoption and use of ICTs in micros)

- Connectivity of all SMEs
- Sensitising SMEs the benefits of digitalisation
- Promoting digital human capital in SMEs
- Promoting technology transfer
- Simplifying barriers to activity/innovation

Citizens

- Broadband connectivity in rural areas
- Use in productive activities (e-banking and e-commerce)
- Regulation for citizens (rights)
- Training in basic skills

Industry

- Attracting talent
- Digital transformation of key sectors (health, food and agriculture, mobility, tourism, finance, etc.)

OPPORTUNITIES

Strong industries

- Language
- Content
- Developers

Online training (third in the EU)

Public procurement of innovation

High-quality business schools

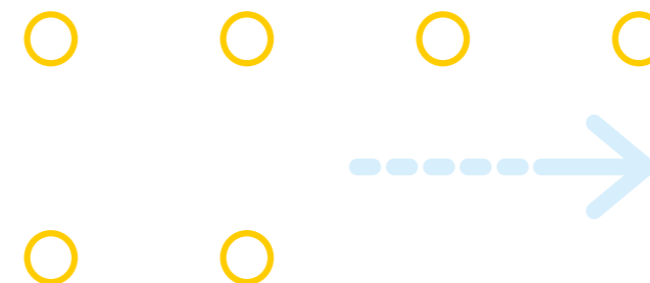
ICT graduates

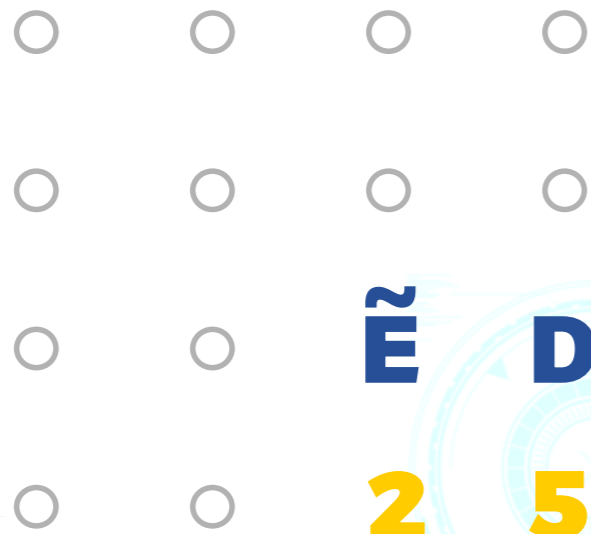
ICT services

Exporters (major companies)

Great potential for cloud roll-out

Digital transformation of key sectors (health, food and agriculture, mobility, tourism, finance, etc.)





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