Atlantic Social Lab

Cooperation for the promotion of Social Innovation

DIGITALISATION IN THE ATLANTIC AREA:

A BRIEF STATISTICAL OVERVIEW

Interreg Atlantic Area
European Regional Development Fund
EUROPEAN UNION

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ACRONYM LIST

ICT	Information and Communication Technologies
IT	Information Technology
NGA	Next Generation Access
UK	United Kingdom
AA	Atlantic Area
DOCSIS	Cable Modem Internet Service
EU	European Union
SMEs	Small and Medium-sized Enterprises
IoT	Internet of Things
AI	Artificial Intelligence
Ibidem	In the Same Place
DESI	Digital Economy and Society Index
DSI	Digital Skills Indicator
SDGs	Sustainable Development Goals
FTTH	Fibre to the Home
FTTB	Fibre to the Building
DSL	Digital Subscriber Line
VDSL	Very-high-bit-rate Digital Subscriber Line

1. INTRODUCTION

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The global COVID-19 crisis was a major societal and economic challenge that required a coordinated and multi-pronged response from businesses, governments, NGOs and social entrepreneurs (Kamran et al., 2022). The lockdown of large parts of society and the economy (Kuckertz et al., 2020) forced companies to react and adapt quickly in order to survive (Scheidgen et al., 2021). Digital technologies received widespread attention. This accelerated the adoption of digital tools to pool expertise, ideas and capacity to generate short and long-term solutions. The increase in the volume of digital communications, teleworking and the automation of business processes has shown that companies must articulate their business on platforms that offer flexibility and scalability in addition to reliability (Telefonica Foundation, 2021). At the same time, a number of institutional and educational services have also been on the move to hybrid models, in which online has become crucial.

Information and communication technologies (ICTs) are being used to address existing socio-economic challenges (Enciso-Santocildes et al., 2021). As a result, these technologies have become essential tools for promoting social innovation (Maiolini et al., 2016). Achieving social innovation requires mobilising and channelling existing resources in unusual ways (Young et al., 2019). Digital intermediation and digitised services are key tools for driving social innovation. The importance and level of digitalisation and future digital plans are essential for providing innovative solutions to social problems (Karajz et al., 2021).

The use of ICTs by citizens, businesses and governments influences the social, economic and environmental impacts of ICT ecosystems (Vrontis et al., 2021). Misuraca and Pasi (2019) highlight the value of technology in enhancing the potential of social innovation, as it can help digitise social service processes and improve their efficiency and effectiveness.

Studies focusing on small and medium-sized enterprises (SMEs) have shown that the adoption of information technology (IT) can improve innovation performance, as IT infrastructures facilitate knowledge sharing processes (Misuraca & Pasi, 2019). In addition to providing practical and professional support to businesses, digital tools can also lead to new competencies and opportunities for individuals (*Ibidem*).

While digital transformation has opened up many opportunities, as organisations adapt to a broader model of remote working and public service delivery via broadband connectivity, it is important to remember that countries and individuals with low levels of digital literacy are less prepared for this transition (Global Digital Transformation Report, 2021). Although digitalisation facilitates citizens' access to public services and contributes to economic and social development, it requires a good education system, philanthropic funding, and effective governance (Nagy & Somosi, 2022).

This document is developed within the project EAPA_246 / 2016 Atlantic Social Lab (ASL) - Atlantic Cooperation for the Promotion of Social Innovation, a project co-financed by the European Regional Development Fund (ERDF) through the INTERREG Atlantic Area Cooperation Programme. The ASL project is led by the municipality of Avilés, in the Spanish region of Asturias, and aims to develop and promote social innovation approaches and methods to respond to key growing social issues in the Atlantic Area (AA), both within citizens, third sector organisations and social enterprises, and within the public sector.

One of the peculiarities of this project is the logic of the partnership constitution. The ASL partnership is multidisciplinary and, above all, represented by actors from different levels: government bodies, non-profit institutions, social enterprises and universities and research centres. In the ASL project, the territorial partners implement pilot actions (i.e., experiment with socially innovative solutions) and the academic partners work to evaluate and monitor the impact of these solutions.

Although the project ended in May 2021, having achieved many tangible results, both in the territorial implementation of social innovation practices and in the generation of knowledge, the pandemic has highlighted the gaps and weaknesses in social inclusion and protection policies. The project has therefore been extended until June 2023, starting in March 2022. The extension phase involves 7 partners covering all the eligible countries of the Atlantic Area, namely the City of Avilés (Spain), Gijón Social Services (Spain), Ave Intermunicipal Community (Portugal), CRIJ Occitanie Pyrénées Mediterranée (France), Enterprise North West (Northern Ireland), Glasgow Caledonian University (Scotland) and the Social Studies Centre of the University of Coimbra (Portugal).

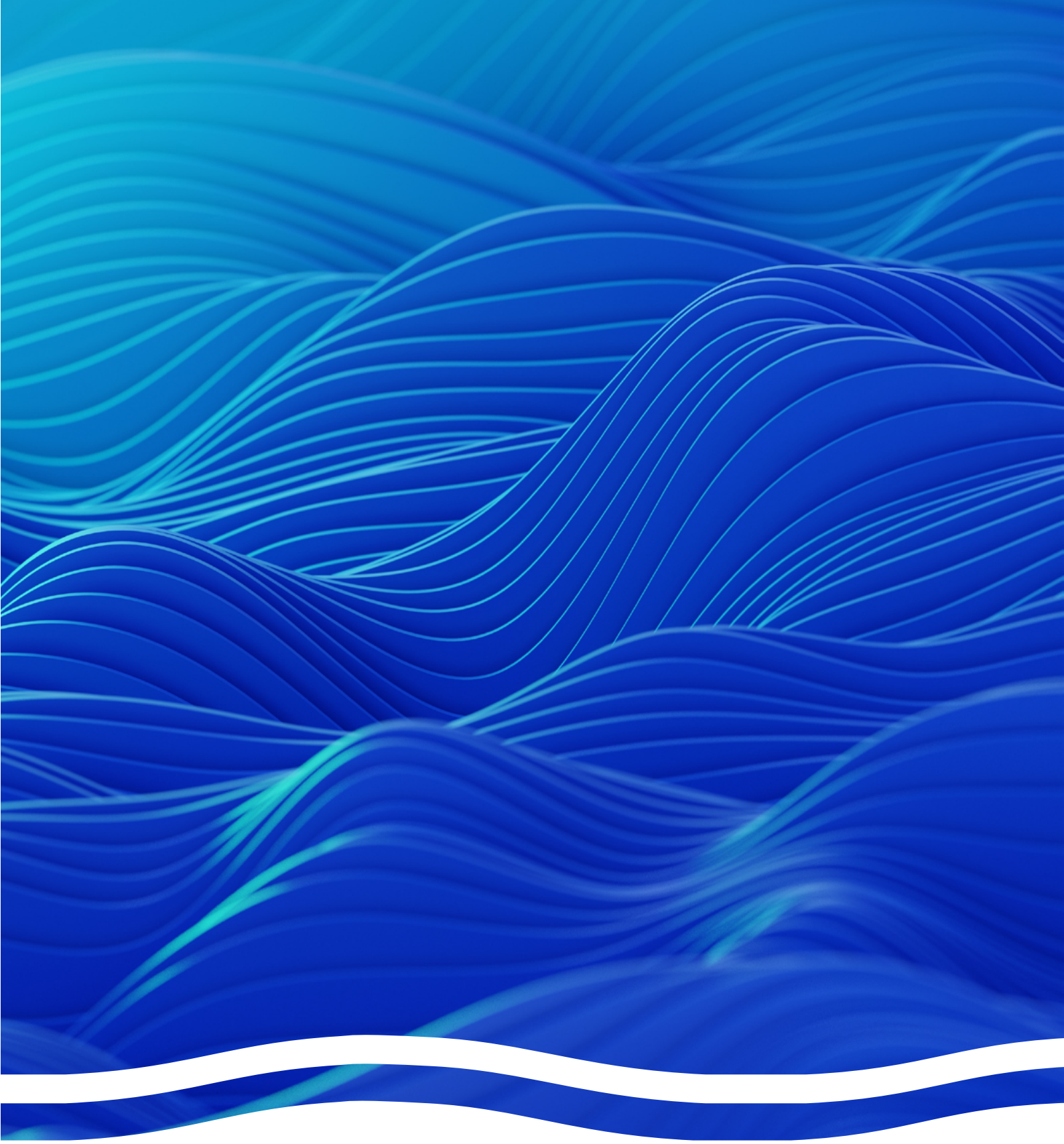
With this extension, five new pilot actions were carried out by five of the partners with territorial competencies to test new approaches and tools to reach citizens through digital tools after the COVID-19 pandemic, namely the Municipality of Avilés (Avilés), Gijón Social Services (Gijón),

Ave Intermunicipal Community (CIM Ave), Occitanie Pyrénées Mediterranée (CRIJ) and Enterprise North West (ENW). The remaining (2) partners are responsible for monitoring the pilot actions implemented: Glasgow Caledonian University (GCU) and the Centre for Social Studies of the University of Coimbra (CES). More specifically, the former is responsible for capitalisation and scientific production, and the latter for dissemination and evaluation.

The new pilot actions are already being evaluated, all of them focusing on digitalisation (a trans-regional challenge in the Atlantic area): The Art of Straw (CIM Ave); NW - Wealth Building Hub (ENW); Youth Compass - (CRIJ); Improving the Communication Policy of the Social Services (Gijón); "No Lo Pierdas, es tu Derecho" - don't miss it, it's your right (Avilés).

As part of the ASL project, this report aims to outline the general structural conditions related to digitalisation in the countries of the Atlantic Area. To this end, it presents a statistical overview on Europe's digital performance, inspired by the Digital Economy and Society (DESI, 2022a). The purpose of this report is to compare and analyse the digital performance of the Atlantic Area countries using secondary quantitative data, mainly from Eurostat.

The report is divided into four main sections. The first consists of a brief theoretical framework on the significance of digitalisation and digital transition in the contemporary world. The second part is devoted to methodological considerations, followed by the presentation of the results. The results are divided into four dimensions: human capital, connectivity, integration of digital technologies and digital public services. The document ends with a series of conclusions.



2. OPPORTUNITIES AND THREATS OF DIGITALISATION

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2.1. Digitalisation in the Context of Covid-19

Over the past three years, the world has experienced a period marked by a new pandemic, known as Covid-19, which has confronted societies with unprecedented threats and challenges, affecting not only economic well-being, but also health and society as a whole.

As the virus spread through highly interconnected societies, it corrupted global markets and disrupted business and social relationships. During such crises, drastic changes can occur in technological knowledge and use, market domains and the symbolic meaning of technological systems, infrastructure, industrial structures and political structures (Geels, 2002). In addition, severe resource shortages can have a profound impact on the needs and demands of society. Supply chains collapse and life-saving goods and services become unavailable as a result of traditional blockade measures. Both the virus and the containment measures put in place to control its spread make it difficult to meet basic human needs (Dahlke et al., 2021).

To address some of the social needs highlighted by the pandemic, digital technology has become mainstream and there has been significant adoption of digital tools to gather knowledge, ideas and skills. As such, it has driven digitalisation in many sectors and radically changed how individuals live and work (Nagy & Somosi, 2022). Distance learning and teleworking have been developed in many countries as a result of health emergencies or containment measures (OECD, 2021).

The Global Digital Transformation Report (2021) found that 82% of respondents from offline organisations said that the pandemic had accelerated the digital transformation of their business. However, organisations are being forced to adapt to the increasing volume of digital communications, teleworking and process automation by leveraging platforms that are reliable, flexible and scalable (Telefonica Foundation, 2021).

Moreover, although the internet has been celebrated for helping individuals and countries maintain a relative sense of normality, the recent pandemic has exacerbated digital inequalities, where a lack of skills has amplified the negative effects of the crisis. In 2019, it was estimated that around 200 million people in Europe were at risk of digital exclusion in terms of working from home, accessing government information and health advice, or attending remote schools, as around 43% of the population lacked basic digital skills (DESI, 2019; Fuller, 2020).

With broadband connectivity, organisations are embracing a broader model of remote working and public service delivery (Global Digital Transformation Report, 2021). However, it is imperative to consider that some societies and citizens lack the skills required for this transformation.

2.2. Digital Transformation and Digital Divide

To a greater or lesser extent, societies around the world are undergoing a digital transformation that has an impact on every aspect of human life through online presence, data and information exchange between devices and individuals. As a result, digitalisation has become an integral part of Industry 4.0 (Karajz, 2021), playing a major role in society. It accelerates daily life, interactions and work, enhances and stimulates learning, contributes to quality of life, promotes autonomy and innovation, and enables growth (Siemens, 2018). Machine design and internal and external communication are increasingly important for exploiting the potential of Industry 4.0 for digital innovation, new services and business patterns (Buhr, 2017). However, it remains unclear whether Industry 4.0 benefits society (*Ibidem*).

The Fourth Industrial Revolution or Industry 4.0 refers to the ongoing automation of traditional manufacturing and industrial practices using modern smart technology (Dhondt et al., 2021). It seeks to improve sustainability, civic responsibility, and quality of life through technology integration (Carayannis & Jancelewicz, 2021).

Sarren and Haarstad (2021) define digitalisation as the process of transforming social, economic and cultural life through the use of digital technologies. It should be noted that this concept is still a work in progress in academic and policy debates, and no consensus has been reached on what should be included. Nevertheless, electronic devices have greatly expanded the ability to store, process and transmit information, which in turn has accelerated the pace of technological change in the economy (Kirov, 2022).

According to Peña-Casas et al. (2018) the digital revolution in the economy and work continues following the third industrial revolution that began in the 1970s. Electronics and information and ICTs have led to an increase in the automation of work and complex processes, and an increasing tertiarisation of the economy. It is argued that this revolution will lead to a renewal of the European economy (*Ibidem*) in the light of rapid globalisation. However, there are concerns and questions about its implications for the future of work and its possible erosion. Thus, in today's society, digital transformation poses significant challenges in the areas of social welfare and economic development.

Freeman and Louçã (2001) recognised that industrial revolutions occur successively. Based on technical change and long waves of economic development, the authors identify five industrial or technological revolutions, namely The Age of Cotton, Iron and Water Power (1); The Second Kondratiev Wave: The Age of Iron, Railways, Steam, Power and Mechanisation (2); The Third Kondratiev Wave: The Age of Steel, Heavy, Engineering and Electification (3); The Fourth Kondratiev Wave: The Great Depression and the Age of Oil, Automobiles, Motorisation and Mass Production (4), and The emergence of a new techno-economic paradigm: the Age of Information and Communication Technologies (ICT) (5).

The above-mentioned authors (*Ibidem*) offer an alternative framework for understanding history, modelling inertia and change, and working out evolution through innovation, shocks and coordination. This approach proposes long historical waves, divided into a generally expansionary Phase A followed by a generally contractionary Phase B (as contradictions and countercurrents build up). According to Louçã (2019), the fourth long wave is currently in Phase B. During Phase B, structural changes have been triggered by three processes: the neoliberal transformation of institutions, the financialisation of the extraction of surpluses, and increased inequality. As a result of these changes, the relative stability of economic and social management that prevailed during the previous wave of expansion is being destabilised, leading to fragile regimes and chaotic international relations (*Ibidem*).

Modern societies have undergone long periods of structural change that cannot be adequately explained by industrial or technological revolutions (Freeman & Louçã, 2001; Louçã, 2019). In Freeman's view, industrial revolutions have two phases: the emergence of the technical potential of the new key factor, for example electricity itself, and its diffusion, including radical and process innovations that led to further social, organisational and technological change (Louçã, 2019). Rejecting technological determinism, Freeman argued that the structural mismatch between the capabilities of the emerging techno-economic paradigm, derived from the pool of available innovations, and the socio-institutional framework required for their deployment, contributed to the long period of readjustment following a crisis of accumulation (*Ibidem*).

Almost every aspect of modern life has already been affected by these revolutions. The digital world is constantly being created and updated by engineers, entrepreneurs, marketers and ordinary consumers at an unprecedented pace. The constant effort required to keep up with the rapid change is exhausting for many consumers and workers. Moreover, many do not have the technical skills or financial resources to adapt, keep up or even catch up. As a result, the digital age is overwhelming and frightening for many consumers, businesses, and policymakers who struggle to adapt to this changing environment and lifestyle, or who are concerned about privacy and cybersecurity (Malter & Rindfleisch, 2019). In this new unstable social reality, characterised by the progressive adoption and use of technologies that are reshaping the structures of society, there are clear digital inequalities, with some companies and individuals struggling to keep up.

The use of ICT in analytical tasks requiring intellectual skills, such as problem-solving, information management and decision-making, is increasing. In this process, digital tools are used to collect and process complex data sets, perform calculations, and plan tasks efficiently and accurately (Peña-Casas et al., 2018).

In response to the current and future needs of the digitalised economy, emphasis is being placed on the acquisition of digital skills. Traditional jobs also require updated skills, as do the skills of potential employees in order to improve their employment prospects (Peña-Casas et al., 2018). According to the same authors, one in two workers lacks ICT skills. A wide range of skills are needed and should be developed, such as specialised skills (e.g., application development), generic skills (e.g., using technology at work) and complementary skills (e.g. problem-solving and information processing) (OECD, 2016). In addition, individuals need basic digital skills to effectively use digital interfaces, which are increasingly necessary for users/clients to access services (Peña-Casas et al., 2018).

The segmentation of the workforce resulting from digitalisation has required low- and medium-skilled workers to upgrade their skills in order to qualify for higher-skilled positions (Valsamis

et al., 2015). According to the European Commission (2015), education and knowledge sharing can be enhanced through the use of digital technologies. Nevertheless, given the speed of technological change, it is difficult to predict what skills will be needed in the future (Peña-Casas et al., 2018).

It is important remember that, in today's world, the possession of digital skills may, in some contexts, increase a person's chances of getting a job, but this does not mean that there will also be an increase in employment or income equality. Digital skills can actually reinforce inequalities between those individuals who do have them and those who do not have them. As Gould et al. (2015, p.4) summarise,

> ***skill formation and the expansion of human capital do not automatically lead to higher levels of economic production; rather, the institutional context of the employment relationship pushes firms along a 'high skills versus low skills' avenue of economic competition***

As the overall level of digital skills increases, the distribution of digital skills does not necessarily benefit the least skilled. Furthermore, Davis and Eynon (2018) argue that digital skills may overcome other workforce characteristics, such as discrimination, competition, or employer requirements.

While governments have previously made efforts to accommodate the shift of public services online, they now see digital skills as a means of preventing unemployment (Fuller, 2020). Digital skills and literacy are becoming increasingly important as a result of digital transformation (*Ibidem*). Thus, basic skills are no longer sufficient to succeed in everyday life or in the labour market (Martínez-Cantos, 2017). As technology advances, workers are increasingly required to keep up with advances in software and other computerised devices (OECD, 2019). As a result of these changes, individuals have been pushed to acquire a variety of skills as well as technological knowledge (Fuller, 2020).

Although digitalisation facilitates citizens' access to public services and contributes to economic and social development and growth, it requires an adequate education system, supportive funding and a well-functioning government (Nagy & Somosi, 2022).

Digitalisation is not reaching all. There are still large inequalities between individuals and countries (Fuller, 2020). Technological integration as a tool for public policy can be potentially problematic if citizens and populations are excluded. Digital inclusion not only increases social awareness, but also enables broader participation in policy development. It is, therefore, imperative to reduce the digital skills gap and increase the digital literacy of citizens before offering them solutions that they are unlikely to understand and adopt.

2.3. Digitalisation and Social Innovation

Social innovation has always been implicit in the development of societies. Development in any social and cultural context is inconceivable without creativity and new approaches to respond effectively to problems that tend to be persistent (Nagy & Somosi, 2022).

According to Pinto et al. (2021), there is no consensus in the literature on the definition of social innovation. However, despite some shortcomings, there is now a better understanding of what constitutes social innovation than there was a few years ago. This understanding is based on the impact of social innovation on policy and investment programmes, particularly in the European Union. The above-mentioned authors consider social innovation as

> ***an idea that deliberately attempts to better satisfy explicit or latent social needs and problems, resulting in new or improved capabilities, and in the transformation of social and power relations, aiming at social change and the establishment of new social practices that positively affect the lives of individuals*** (p.65)

These authors point out that this definition is broad enough to cover most social innovation case studies, while trying to emphasise what the 'social' component of social innovation really means (*Ibidem*). In short, social innovation as a whole is a strategy aimed at solving specific social problems through deliberate, responsible interaction between different parties (Morawska-Jancelewicz, 2021).

Different types of organisations, interest groups and individuals develop and propose social innovations. These actions, driven by a social purpose and social value, are increasingly being implemented with the help of modern IT tools, smart machines, artificial intelligence (AI) and other emerging technologies, which are being increasingly viewed as facilitators in addressing the diverse demands of society.

The mobilisation of existing resources and their channelling in innovative ways is essential for social innovation (Young et al., 2019). Technology, which enables digital intermediation and digitised services, is an important tool for facilitating such social innovation. Krlev et al. (2020) found that technologies - and digital media - can support social innovation and thus create social value. Along these lines, it is essential to understand the importance and level of digitalisation and future digital plans to provide innovative solutions to social problems (Karajz et al., 2021). Digital responses, together with social innovation, especially employment-oriented ones, are likely to stimulate job creation, regional progress and competitiveness. This will contribute to alleviating current problems that tend to persist, such as social exclusion, poverty, inequality and resource deprivation (Enciso-Santocildes et al., 2021).

However, social innovation also brings new challenges to policymaking and practice. Organisations, governance bodies and public policy need to address the tensions arising from the 'time lag' between the process and their processes. In the discussion conducted by Pinto et al. (2021), the most important challenge was highlighted the lack of public mechanisms for transferring social innovation projects and outcomes into public policy.

3. METHODOLOGY

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3.1. The "Path to the Digital Decade"

The *European way to the Digital Decade* for 2030 translates the EU's digital ambitions for 2030 into concrete targets and will be based on an enhanced monitoring system that will track the pace of digital transformation in the EU, gaps in Europe's strategic digital capabilities and the implementation of digital principles. It outlines key milestones along four cardinal points. The first two address digital capacity in infrastructure and education and skills, while the other two address the transformation of businesses and public services (European Commission, 2021a).

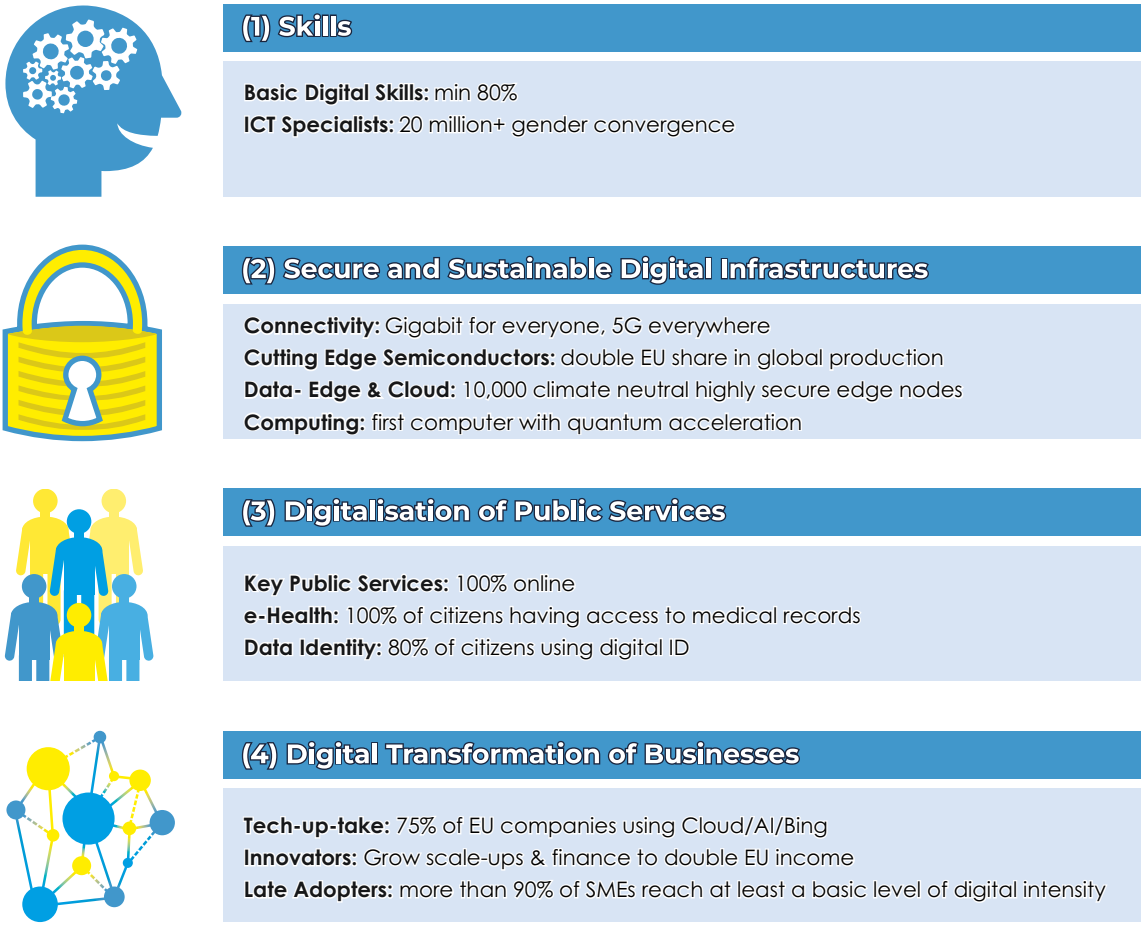

Figure 1. **Targets of the Path to the Digital Decade**

*Source: adapted from **DESI** (2022)*

More specifically, in line with the European Commission (2021a), the first goal focuses on a highly skilled digital workforce and a population with high levels of digital literacy. The development of high-performing digital education ecosystems, as well as effective policies to foster connections and attract talent from around the world, will be essential. As a society, digital literacy will be crucial to the strengthening of collective resilience. The European Skills Agenda states that basic digital skills for all citizens and the opportunity to acquire specialised digital skills for the workforce are prerequisites for active participation in the Digital Decade (*Ibidem*).

The European Pillar of Social Rights Action Plan sets a target of 80% of adults with at least basic digital skills by 2030 (*Ibidem*). To fully benefit from the prosperity of an inclusive digital society, it is essential that all European citizens have access to education that enables them to acquire basic digital skills and that lifelong learning becomes a reality. To build a society in which digital products and online services can be trusted, disinformation and scams can be identified, cyber-attacks, fraud and online scams can be avoided, and children can learn to understand and navigate the myriad of information available online, the development of broad digital skills is also essential. To develop advanced digital skills, coding and computer science skills alone are not enough. People should be able to acquire specialised digital

skills through digital education and training to get quality jobs and rewarding careers. More than 70% of businesses cite a lack of staff with adequate digital skills as a barrier to investment. Women comprise only one in six ICT specialists and one in three graduates in STEM subjects. There is also a lack of specialised education and training programmes for areas such as artificial intelligence (AI), quantum physics and internet security, as well as low integration of digital subjects and multimedia educational tools. Domestic action should be complemented by support to improve digital literacy globally in order to achieve the UN Sustainable Development Goals (SDGs) (*Ibidem*).

The second objective relates to a sustainable digital infrastructure that is both secure and efficient. A sustainable digital infrastructure will help Europe achieve digital leadership by enabling other technological developments and supporting industrial competitiveness, including connectivity, microelectronics and handling large amounts of data. Excellent and secure connectivity across Europe is essential for a society where every business and citizen can participate fully (*Ibidem*).

According to the European Commission (2021a), gigabit connectivity must be achieved by 2030. The focus should be on developing next-generation fixed, mobile and satellite connectivity that is more sustainable, with high-capacity networks, including 5G, that are deployed quickly and efficiently, spectrum allocation that is efficient, 5G cybersecurity tools that are respected, and 6G that will soon be developed. Over the next decade, households will increasingly use these network technologies as their need for high-speed connectivity grows. By the end of the decade, new digital communication methods and capabilities, including high-precision, holographic media and digital senses over the network, will give a whole new perspective to a digitally enabled society that supports the need for gigabit connectivity. For cloud computing and data processing, businesses will need dedicated gigabit connections, as will schools and hospitals for e-learning and e-health. For the processing of data in real time, high performance computing (HPC) will require terabit connections.

With regard to the third goal, as a result of the COVID-19 pandemic, many companies are more dependent on digital technologies. In ten years' time, for the development of new products, new manufacturing processes and new business models based on transparent data sharing, digital technologies such as 5G, the Internet of Things (IoT), edge computing, AI, robotics and augmented reality will be crucial. The swift adoption and implementation of the Commission's proposals for the Digital Single Market and the Shaping Europe's digital future strategies (*Ibidem*) will ensure a fair and competitive digital economy, which must be matched by a level playing field abroad.

The ability of businesses to rapidly adopt new digital technologies across the board, including in industrial and service ecosystems, will determine their ability to transform. Efforts should be made to encourage businesses to adopt digital technologies and products that have a smaller environmental footprint and are more efficient in terms of energy and materials (*Ibidem*).

With the support of more than 200 digital innovation hubs and industrial clusters, SMEs, which make up the majority of EU enterprises and are a key source of innovation, should have easy and fair access to digital technologies and data, supported by appropriate regulation, and receive adequate support for digitalisation by 2030. This can be achieved by supporting the digital transformation of innovative and non-digital SMEs across the EU, connecting digital providers with local ecosystems and creating more than 200 European digital innovation poles and industrial clusters. It aims to achieve high digital intensity, ensuring that no one is left behind. In order to achieve the 2030 targets, the Commission will update its industrial strategy, which will include the acceleration of the digital transformation of industrial ecosystems (*Ibidem*).

Concerning the last goal, by 2030 the EU aims to make democratic life and public services online fully accessible to all, and to provide simple, efficient and personalised services and tools that respect high levels of security and privacy in the digital environment. Citizens of all ages and businesses of all sizes can more effectively influence the direction and outcomes of government activities through the provision of user-friendly services. E-Government will provide holistic and easy access to public services by combining advanced capabilities such as computing, AI and virtual reality. Encouraging businesses to become more digital and provide more efficient digital services will also contribute to productivity gains (*Ibidem*).

Public services are increasingly provided online. However, they are often basic services (e.g. filling in forms). Europe must use digitalisation to bring about a paradigm shift in citizen engagement, public administration and democratic institutions in order to ensure interoperability between all levels of government and between public services (*Ibidem*).

Smart data platforms are also being developed by EU communities to integrate data across sectors and cities to improve citizens' quality of life. Basic digital services, such as smart parking, smart

lighting and public transport telematics, are provided by most of these platforms. Modern and efficient justice systems, enforcing consumer rights and more effective public policies, including law enforcement and investigative capacities, should also be enabled by digital transformation (*Ibidem*).

3.2. Dimensions and Indicators of Digitalisation

The methodology used is based on the Digital Economy and Society Index (DESI, 2022). The DESI tracks the progress of EU countries' digital competitiveness and summarises indicators of Europe's digital performance.

It identifies four key dimensions of digitalisation: human capital (1); connectivity (2); integration of digital technologies (3) and digital public services (4), and their respective indicators, which are linked to the objectives of the "Path to the Digital Decade" programme proposed by the European Commission. It is important to note that the development of the digital economy and society requires concerted improvements in all areas. The dimensions mentioned are therefore interrelated.

The human capital dimension is an assessment of the Internet user skills of citizens and the advanced skills of experts. The connectivity dimension measures the supply of and demand for fixed and mobile broadband as well as retail prices. The integration of digital technologies comprises three sub-dimensions: digital intensity, the use of selected technologies by enterprises and electronic commerce. The dimension of digital public services covers the production and consumption of electronic public services as well as open data policies. Digital public service indicators for citizens and enterprises (DESI, 2022) are highlighted in this dimension.

The indicators for each dimension have been selected in accordance with the purpose of our report and data availability. The indicators selected for each dimension are set out in Table 1. Using Eurostat - the statistical office of the European Union - as the main source of data on the digital economy and society, an extensive set of secondary data was collected and analysed, focusing on the countries of the Atlantic Area: Portugal, Ireland, UK, Spain and France.[1]

Table 1. **Dimensions and Indicators of Digitalisation**

Dimension	Sub-dimension	Indicator
1. **Human Capital**	1a. **Internet User Skills**	1a.1. **Basic or Above Basic Digital Skills**
	1b. **Advanced Skills & Development**	1b.1. **ICT Security & Privacy**
		1b.2. **ICT Specialists** **ICT Graduates** (total)
		1b.3. **ICT Specialists by Sex**
		1b.4. **ICT Education**
		1b.5. **Enterprises Providing ICT Training**

[1]There were some difficulties in finding up-to-date UK values for all indicators, as the indicators selected for this report come from the European Union, more specifically the Digital Economy and Society Index, which considers the EU's digital ambitions for 2030. Therefore, a variety of methods were used to estimate the values of these observations. These included using the previous year's data, using the following year's data or using proxy indicators to complete the time series analysis. A number of graphical representations of the data analysis were produced following data collection.

Dimension	Sub-dimension	Indicator
2. **Connectivity**	2a. **Fixed Broadband Take-Up**	2a.1. **Fixed Broadband Take-Up**
	2b. **Fixed Broadband Coverage**	2b.1. **Fast Broadband** (NGA) **Coverage**
		2b.2. **High Speed Cable Broadband**
	2c. **Mobile Broadband**	2c.1. **Mobile Broadband Take-Up** (by individuals)
		2c.2. **5G Coverage** (by households)
3. **Integration of Digital Technology Dimensions**	3a. **Digital Intensity**	3a.1. **SMEs with at least a basic level of digital intesity**
	3b. **Digital Technologies for Business**	3b.1. **Iot E-Business**
		3b.2. **Social Media**
		3b.3. **Big Data**
		3b.4. **AI Use**
	3c. **E-Commerce**	3c.1. **E-Commerce Sales**
		3c.2. **Selling Online Cross-Border**
4. **Digital Public Services**	4a. **E-Gorvernmment**	4a.1. **E-Governmment Users**
		4a.2. **Digital Public Services for Citizens**
		4a.3. **Digital Public Services for Businesses**

*Source: adapted from **DESI** (2022)*

4. STATISTICAL OVERVIEW

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4.1. Human Capital

4.1.1. Internet user skills

As a composite indicator, the Digital Skills Indicator 2.0 (DSI) assesses the performance of individuals aged 16-74 in five specific areas related to internet and software use: information and data literacy, communicating and collaborating, creating digital content, security and problem-solving. It is assumed that individuals who have performed certain activities have the corresponding skills (Eurostat, 2023).

Regarding the indicator of individuals with *'basic' or 'above basic' digital skills'* (Figure 2), it can be seen that between 2015 and 2021, all countries in the Atlantic Area (AA), as well as the EU[2] in general, show an increase in individuals with digital skills, with the United Kingdom leading the way. However, the number of people with digital skills is still low in both the AA and the EU. A significant increase in the proportion of individuals with digital skills from 2019 is evident in all AA countries. This evidence may be strongly influenced by the recent pandemic and the resulting containment measures, which 'forced' citizens to adapt to the digital world, especially at work and school, as a means to contain the spread of the virus (OECD, 2019; Nagy & Somosi, 2022). Note that the apparent decline in the EU between 2019 and 2021 may be due to the exit of the UK (one of the most prominent countries in terms of digitally skilled individuals).

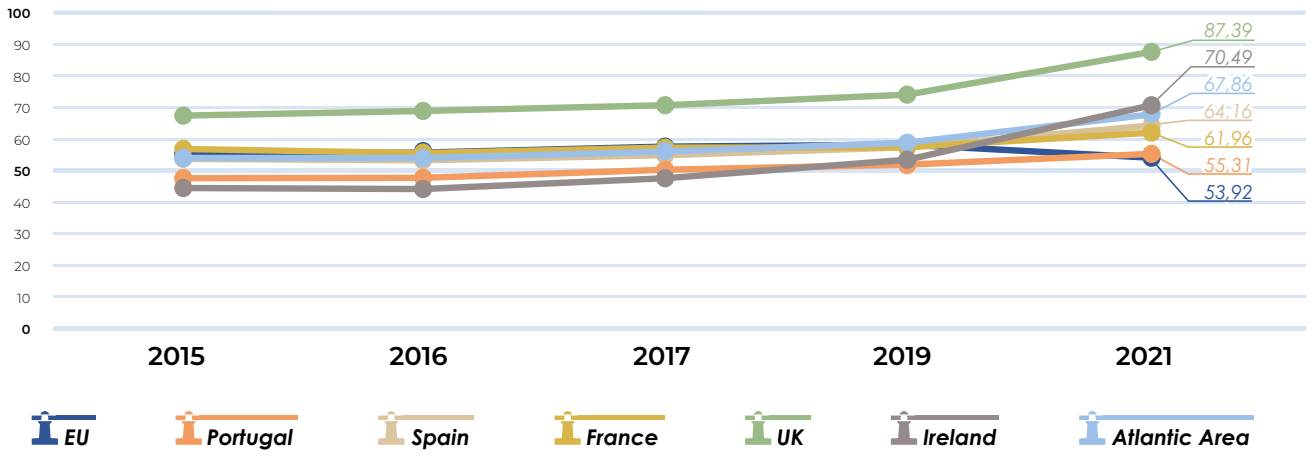


Figure 2. **Basic or Above Basic Digital Skills** *(% individuals, 2015-2021)*

Source: *Own Elaboration*

Comparing the countries of the AA, in 2021 the UK had the highest share (87.39%), followed by Ireland (70.49%), Spain (64.16%), France (61.96%) and Portugal (55.31%). The European Union, which includes Portugal, France, Ireland and Spain, had a shortage of people with digital skills and is still far from achieving the Digital Compass 2030 targets. As part of the path to the Digital Decade, it is proposed that at least 80 percent of citizens should have at least basic digital skills by 2030 - Figure 3. This confirms arguments that digitalisation is still not reaching everyone (Fuller, 2020).

[2] In the EU until 2019, the values correspond to the EU28 (before UK exit in the beginning of 2020).

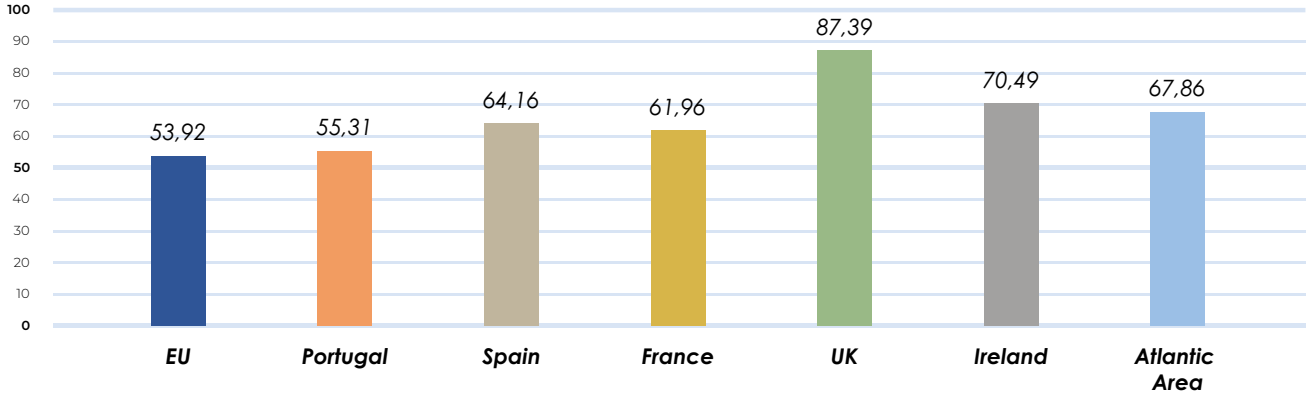
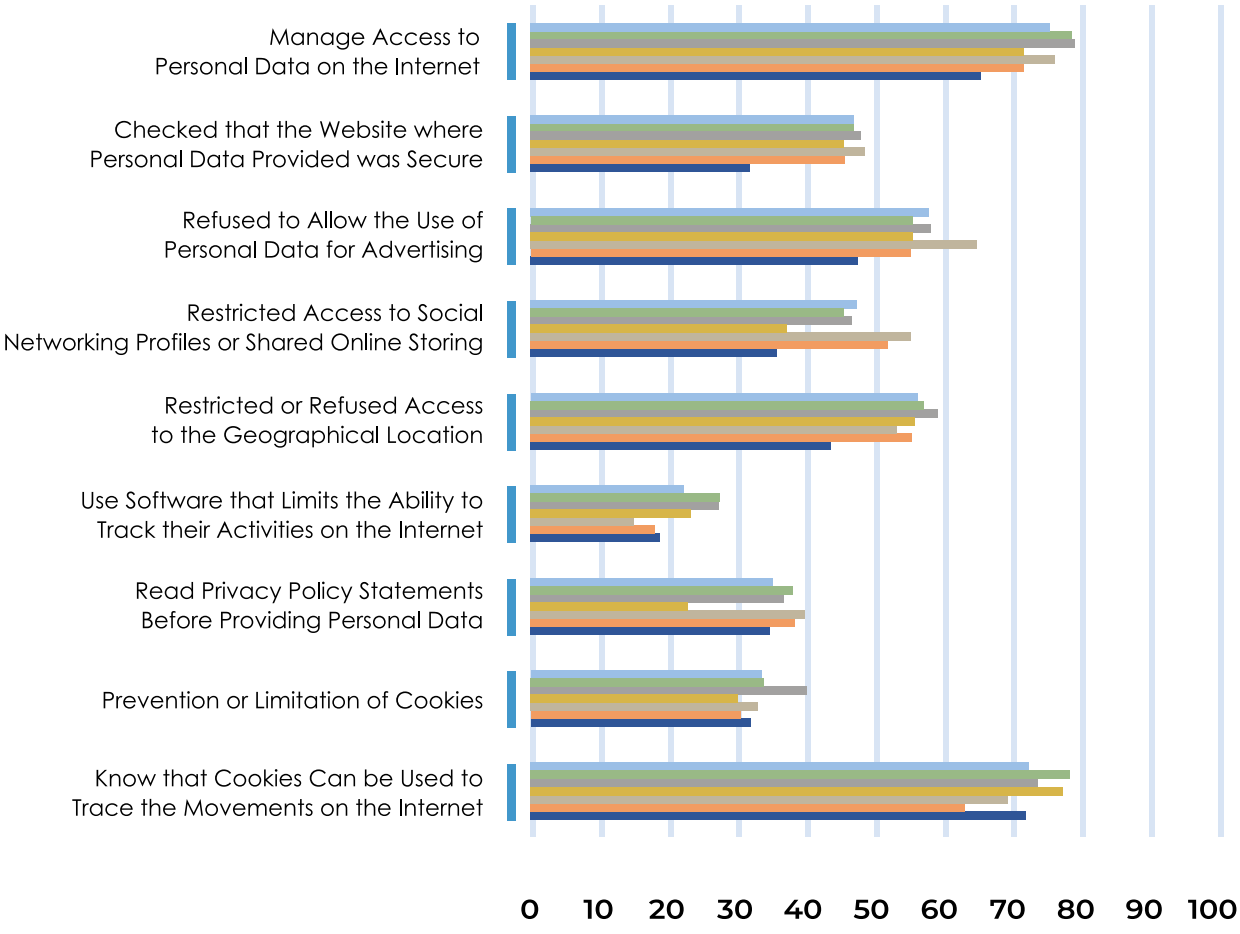


Figure 3. **Basic or Above Basic Digital Skills** *(% individuals, 2021)*

Source: *Own Elaboration*

In terms of privacy and information protection (Figure 4), which refers to knowledge of the sharing of personal data and its prevention/limitation, the sub-indicator that stood out most in the AA in 2021 was *'Manage access to personal data on the Internet'* (75.01%), followed by *'Understand that cookies can be used to track Internet movements'* (71.91%). For the former, the three countries with the highest scores in the AA were the UK (77.28%), France (76.7%) and Ireland (73.26%). For the latter, the most notable countries were Ireland (78.55%), the United Kingdom (78.15%) and Spain (75.78%).

Among all sub-indicators, *'Use software that limits the ability to track their internet activities'* stood out the least (22.14%), followed by *'Prevention or limitation of cookies'* (33.34%). Hence, only 49.33% of the AA population have sufficient digital knowledge to protect their personal information.



	Know that Cookies Can be Used to Trace the Movements on the Internet	Prevention or Limitation of Cookies	Read Privacy Policy Statements Before Providing Personal Data	Use Software that Limits the Ability to Track their Activities on the Internet	Restricted or Refused Access to the Geographical Location	Restricted Access to Social Networking Profiles or Shared Online Storing	Refused to Allow the Use of Personal Data for Advertising	Checked that the Website where Personal Data Provided was Secure	Manage Access to Personal Data on the Internet
AA	71. 91	33.34	35.02	22.14	55.81	47.09	57.47	46.70	75.01
UK	77.78	33.70	37.92	27.36	56.81	45.32	55.15	46.77	78.15
Ireland	73.26	39.96	36.55	27.23	58.77	46.47	57.85	47.72	78.55
France	76.90	29.96	22.75	23.18	55.52	37.07	55.17	45.27	71.24
Spain	68.93	32.78	39.65	14.93	52.87	54.98	64.4	48.34	75.78
Portugal	62.69	30.31	38.23	17.99	55.09	51.59	54.8	45.39	71.31
EU*	71.6	31.76	34.63	18.72	43.43	35.57	47.32	31.74	65.03

Figure 4. **ICT Security and Privacy** *(% of individuals, 2021)*

Source: *Own Elaboration*

It is interesting to observe that although more than half of the respondents are aware that cookies can track their movements on the Internet, few actually prevent or limit them. This finding may be related to the fact that although Internet users are aware of the nature of cookies, they do not know how to limit and protect themselves. Alternatively, they may simply not care if cookies can be used to track their movements on the Internet.

4.1.2. Advanced skills and development

The indicator of '*ICT Specialists Employed*' refers to the percentage of persons aged 15-74. Based on the ISCO-08 classification, this indicator includes occupations such as ICT service managers, ICT professionals, ICT technicians and ICT installers and service providers (DESI, 2022).

A slight increase in the number of ICT professionals employed in the AA and the EU can be observed between 2012 and 2021 (Figure 5). Ireland was the country that showed a notable evolution, as it was unstable (increasing and decreasing) until 2020, being more or less at the same level as the United Kingdom, both having the highest values. Despite this small increase in the number of ICT specialists employed in the AA countries and the EU, there is still a general shortage of ICT specialists.

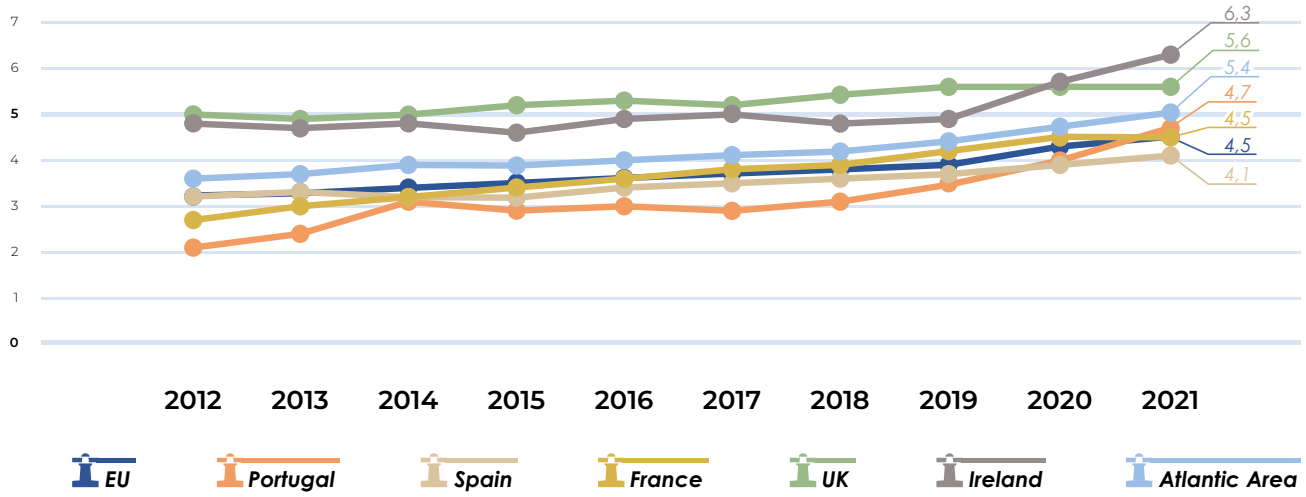


Figure 5. **ICT Specialists Employed** *(%, 2012-2021)*

Source: *Own Elaboration*

Looking at the distribution of *'ICT specialists by sex'* in 2021, there was a large imbalance. In both the AA and the EU, only 19.6% and 19.1% respectively of the ICT professionals employed were women - Figure 6. This highlights the gender gap in the labour market regarding the recruitment of women with digital skills. This gap was more pronounced in the UK (82.9% versus 17.1%), followed by Spain (80.6% versus 19.4%) and Ireland (80% versus 20%).

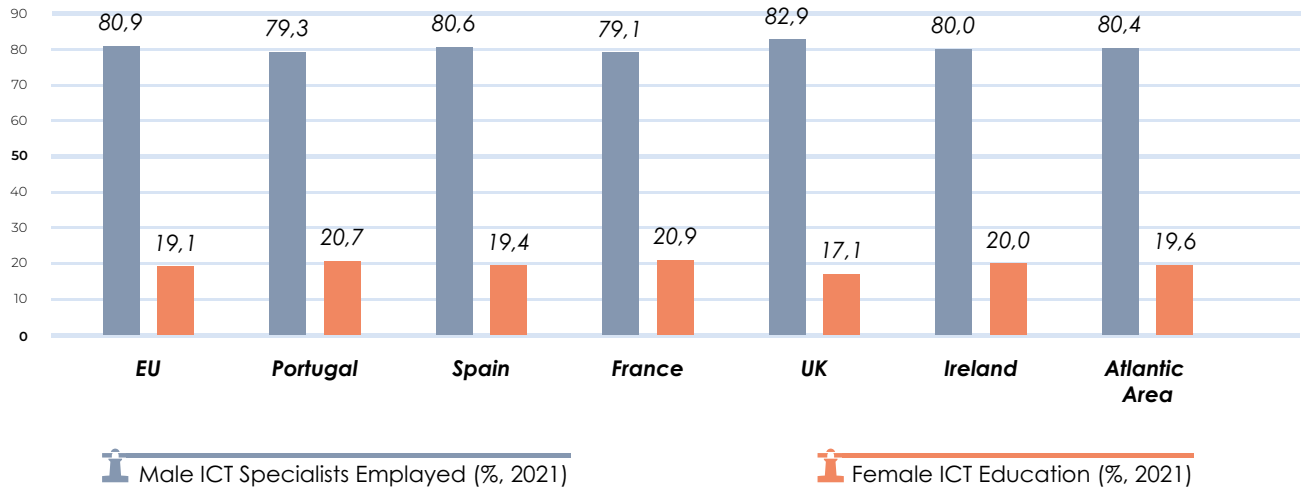


Figure 6. **ICT Specialists by sex, 2021**

Source: Own Elaboration

As regards the indicator of *'ICT education'*, which refers to the percentage of employed persons with ICT education, the vast majority of employed persons in the AA, as well as in the EU have had ICT education between 2012 and 2021 (Figure 7). Thus, the majority of employed people have at least basic digital skills.

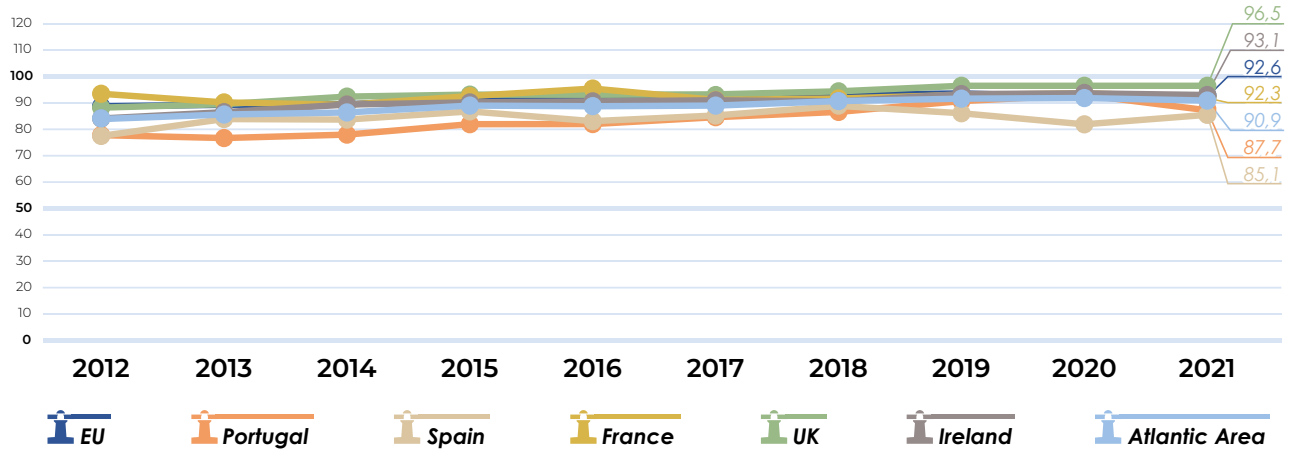


Figure 7. **ICT Education** *(%, 2012-2021)*

Source: Own Elaboration

However, in 2021, only a small proportion of those considered to be ICT specialists was employed (AA 5.4%; EU 4.5%), even though there was a large proportion of digitally literate people in the labour market (AA 90.9%; EU 92.6%) (Figure 8). This indicates that although there is a large number of employees with ICT training and therefore with what is considered basic digital skills, there are still few individuals with advanced digital skills to fill vacancies in enterprises, as stated by the European Union (*Ibidem*).

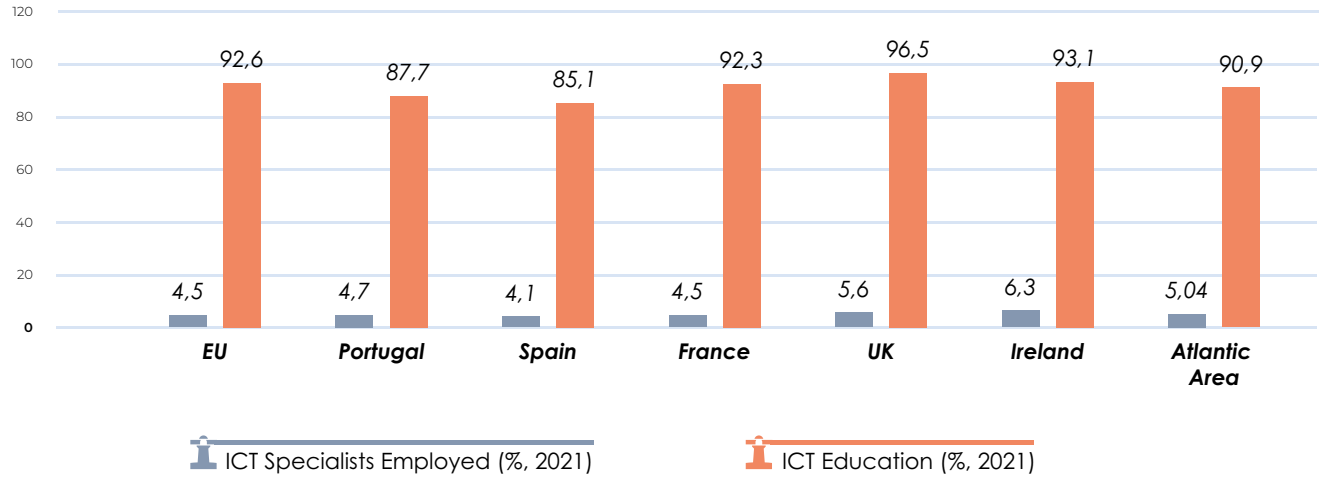


Figure 8. **ICT specialists vs. ICT education**

Source: Own Elaboration

With regard to the percentage of *'enterprises providing training'* to develop/upgrade the ICT skills of their employees by enterprise size class (10 or more persons employed), Figure 9 surprisingly shows an unstable trend between 2012 and 2021, both in the AA and in the EU, which has been on the decline in recent years. Thus, few enterprises provide ICT training to their employees, while a significant proportion of enterprises lack employees with advanced digital skills.

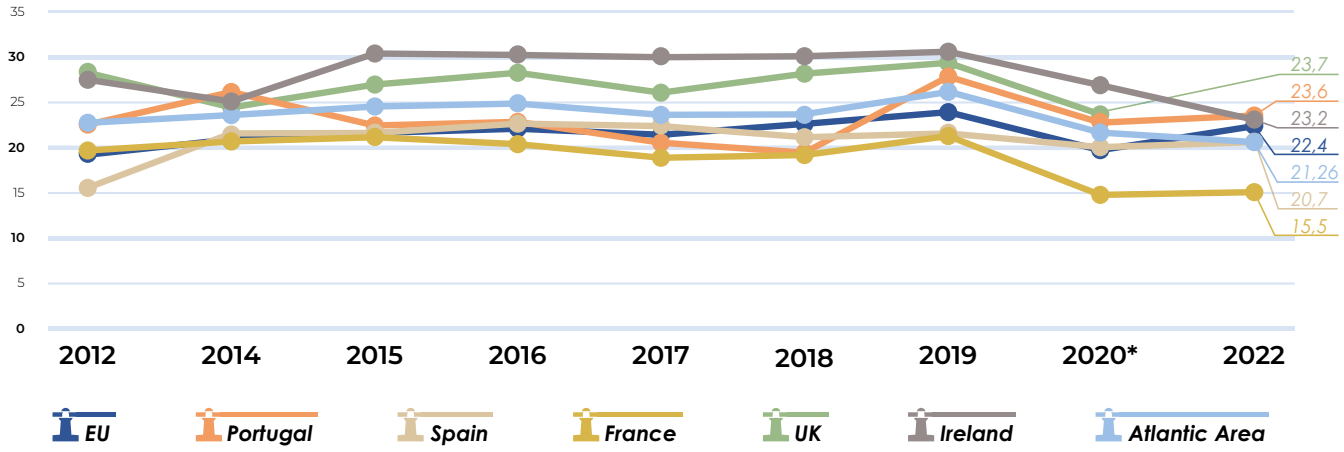


Figure 9. **Enterprises providing ICT training** *(%, 2012-2022)*

Source: Own Elaboration

In 2022, compared with 2012, there was a slight increase in the number of enterprises providing this type of training in the EU (19.3% and 22.4% respectively). However, there was a decrease in the AA (22.78% and 21.26% respectively), although this is not statistically significant. Among the five Atlantic countries, France showed the largest decrease between 2019 and 2022 (21.3% and 15.1%, respectively) (Figures 9 and 10).

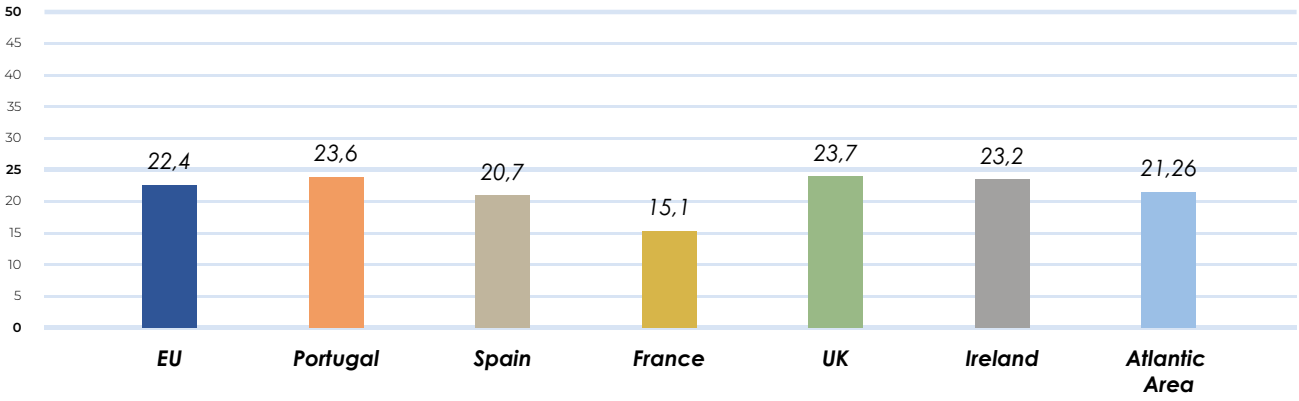


Figure 10. **Enterprises providing ICT training** *(%, 2022)*
Source: Own Elaboration

The UK (23.7%), closely followed by Portugal (23.6%) and Ireland (23.2%), was the country with the highest percentage of enterprises providing ICT training.

4.2. Connectivity

With the exception of the indicator *'Internet use on a mobile device'*, all indicators in this dimension were collected using the final dataset available in Excel from the *'Broadband Coverage in Europe in 2021'* report (European Commission, 2021b). They are presented as a percentage of households. This dataset covers all AA and EU countries from 2013 to 2021. It should be noted that in 2021 there were 29 196 351 households in the UK; 28 903 438 in France; 18 334 701 in Spain; 4 039 289 in Portugal and 1 789 424 in Ireland - Figure 11.

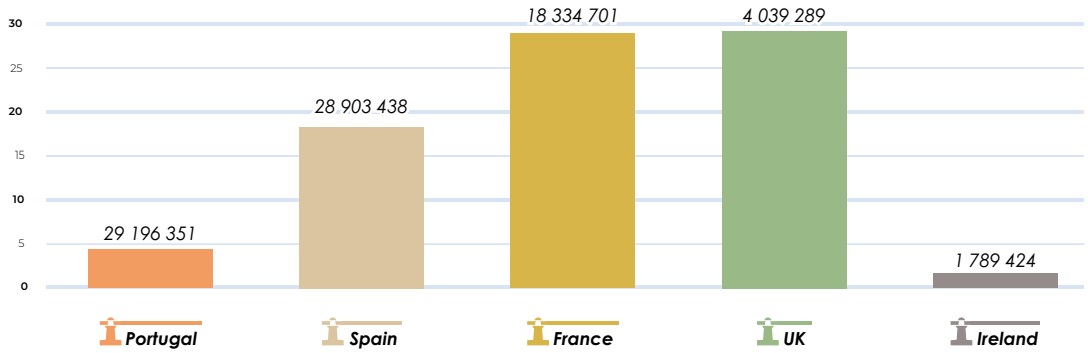


Figure 11. **Households in the Atlantic Area countries** *(Total, 2021)*

Source: Own Elaboration

In *'Connectivity'*, both fixed and mobile broadband are analysed with indicators that measure supply as well as demand.

4.2.1. Fixed broadband take-up

'Fixed broadband take-up' refers to the percentage of households with a fixed broadband subscription. For the years 2013 to 2021, all countries in the AA had more than 90% of households with a fixed broadband subscription. The UK and France were the highest, while Portugal and Spain were the lowest (Figure 12).

It is interesting to note that the two countries that stood out the most were effectively the ones with a close position in the number of households in the AA.

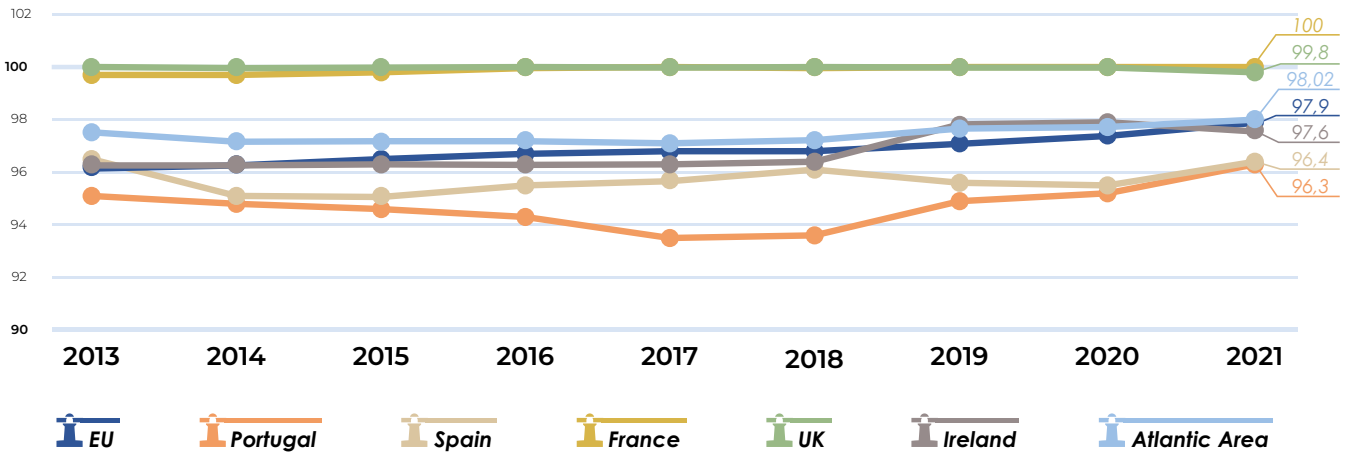


Figure 12. **Fixed broadband take-up** *(% of households, 2013-2021)*

Source: Own Elaboration

In 2021, as shown in Figure 13, France had the highest percentage of households with a fixed broadband connection (100%), followed by the United Kingdom (99.8%) and Ireland (97.6%). The lowest percentages were found in Spain (96.4%) and Portugal (96.3%).

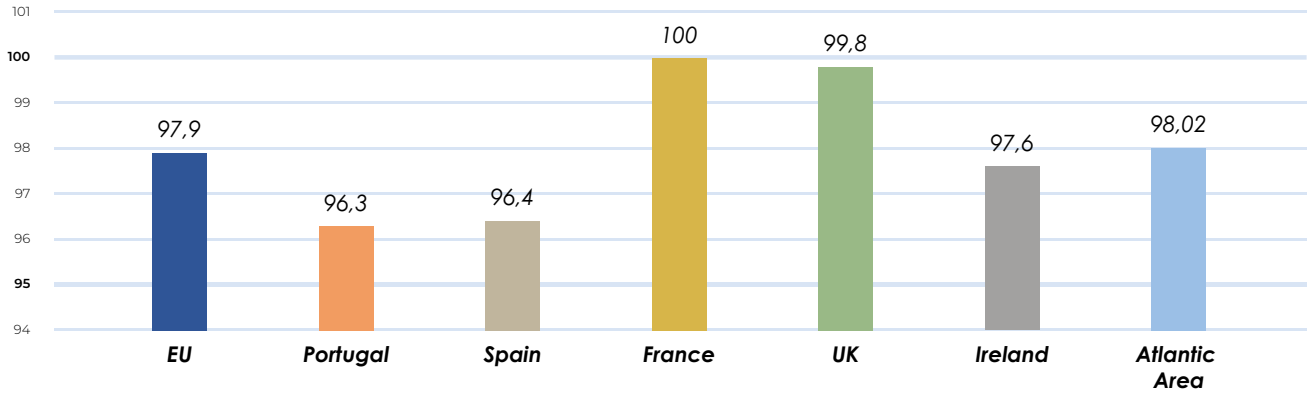


Figure 13. **Fixed broadband take-up** *(% of households, 2021)*
Source: Own Elaboration

It should be noted that the AA outperformed the EU in terms of fixed broadband take-up by households. However, there were significant percentages in all countries analysed, as well as in the EU.

4.2.2. Fixed broadband coverage

'High speed broadband coverage' - Next Generation Access (NGA) refers to the percentage of households with fixed broadband speeds of at least 30 Mbps. Four technologies are considered: FTTH, FTTB, cable DOCSIS,3.0 and VDSL. Note that Fibre to the Home (FTTH) is the most widely deployed fibre access network (Kim, 2022). DOCSIS is the standard for cable modem Internet service (and triple play) in the UK and most other countries. FTTB stands for Fibre to the Building and VDSL stands for Very-high-bit-rate Digital Subscriber Line and is the fastest form of Digital Subscriber Line (DSL) connection (Kim, 2022; Mixvoip, 2023).

From 2013 to 2021, there was a significant increase in the number of households adopting NGA in all AA countries, as well as in the EU as a whole (Figure 14). The UK has consistently stood out over the years, followed by Ireland and Spain. In contrast, France has been the country with the lowest percentage of households using fast broadband of at least 30 Mbps.

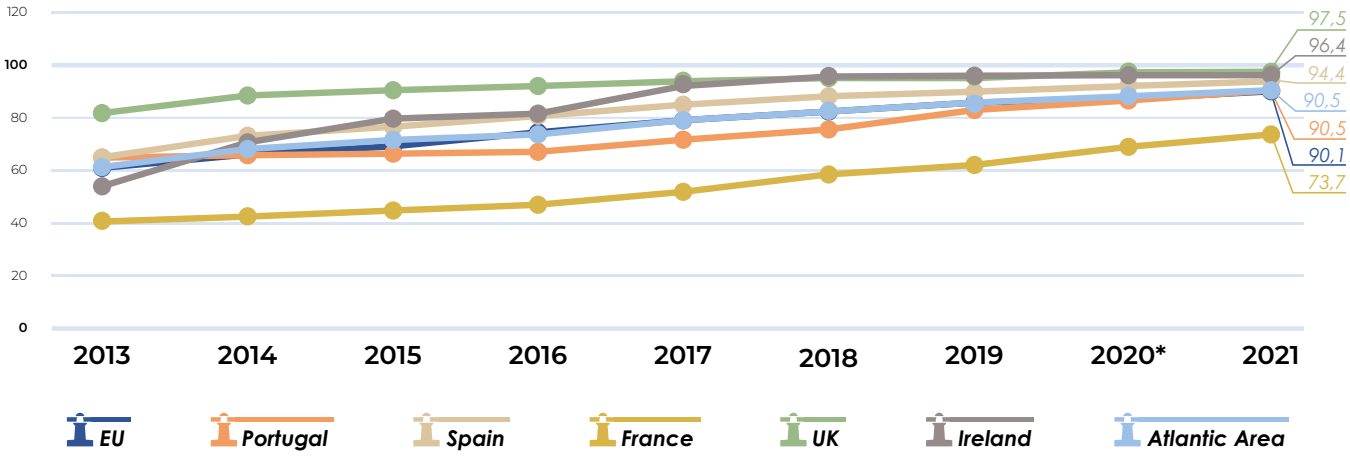


Figure 14. **Fast broadband coverage - NGA** *(% of households, 2013-2021)*
Source: Own Elaboration

In 2021, the UK ranked first with 97.5% of households using NGA, followed by Ireland (96.4%) and Spain (94.4%). Conversely, Portugal (90.5%) and France (73.7%) had the lowest levels in the AA (Figure 15). It is worth mentioning that the percentages were still significant in all the countries considered and in the EU as a whole, representing more than half of the households in each of the countries using NGA.

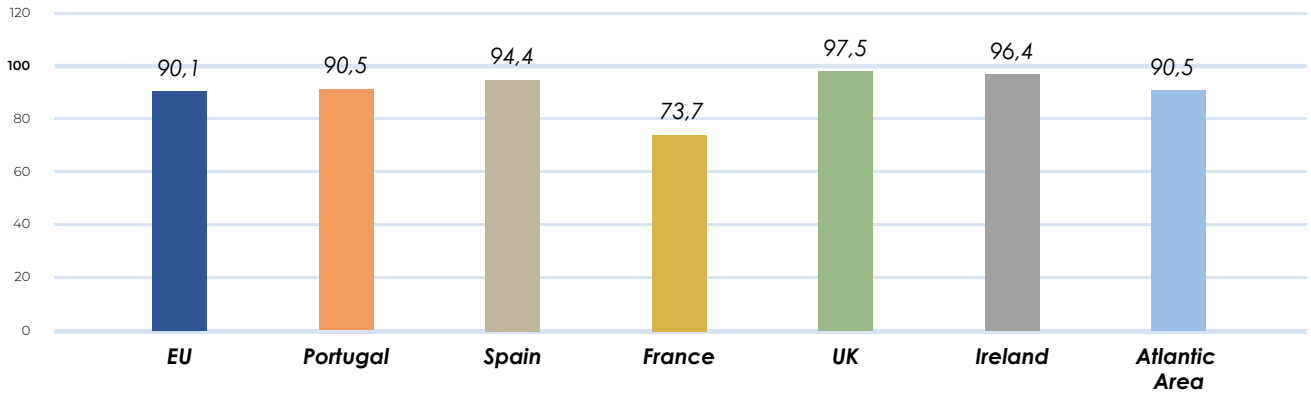


Figure 15. **Fast broadband coverage - NGA** *(% of households, 2021)*
Source: Own Elaboration

When it comes to *'high-speed cable modems'*, there are two types: the older DOCSIS 3.0 and the newer DOCSIS 3.1 (updated in 2019), which are measured by the percentage of households using them.

For the former, the results have remained stable in most cases over the years. However, the use of DOCSIS 3.0 dropped by 19.4% between 2013 and 2021 in Spain and France. In the AA, the country with the highest score over the years was Portugal, with figures above 50%. On the other hand, France was the country with the lowest share, with a decrease of 7.2% between the years considered (Figure 16)

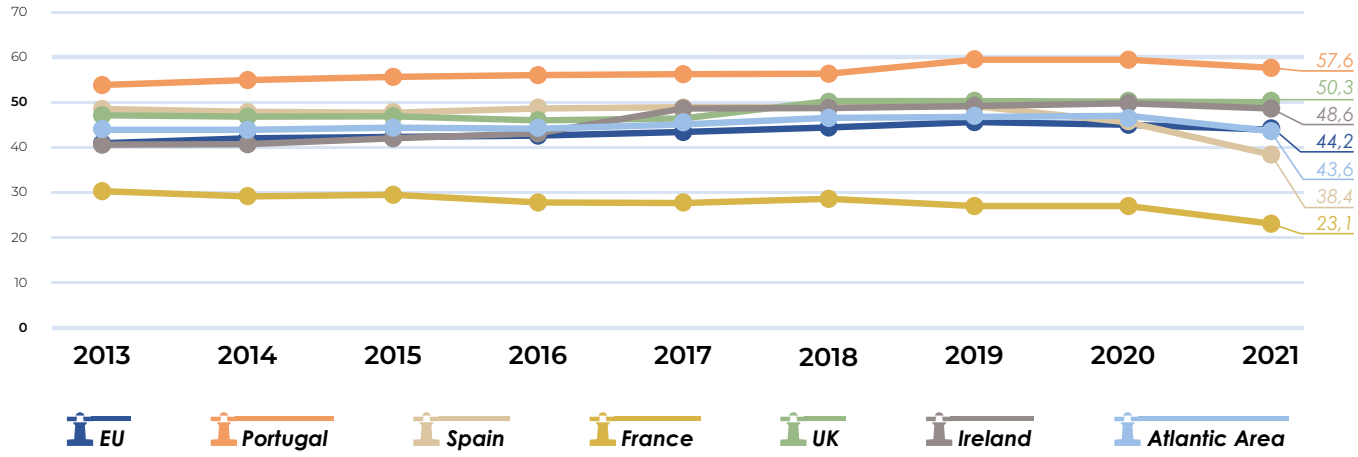


Figure 16. **Cable modem DOCSIS 3.0**
Source: Own Elaboration

In the years 2019-2021, Portugal represented the highest value for the DOCSIS 3.1 cable modem. A significant increase in DOCSIS 3.1 adoption can be observed in Ireland, from 0 to 48.5%. Curiously, there was a decrease of 10.5% in Spain (Figure 17). France has not yet reported DOCSIS 3.1 adoption data. However, the average AA was between 20 and 30%. Nevertheless, it was slightly higher than the EU.

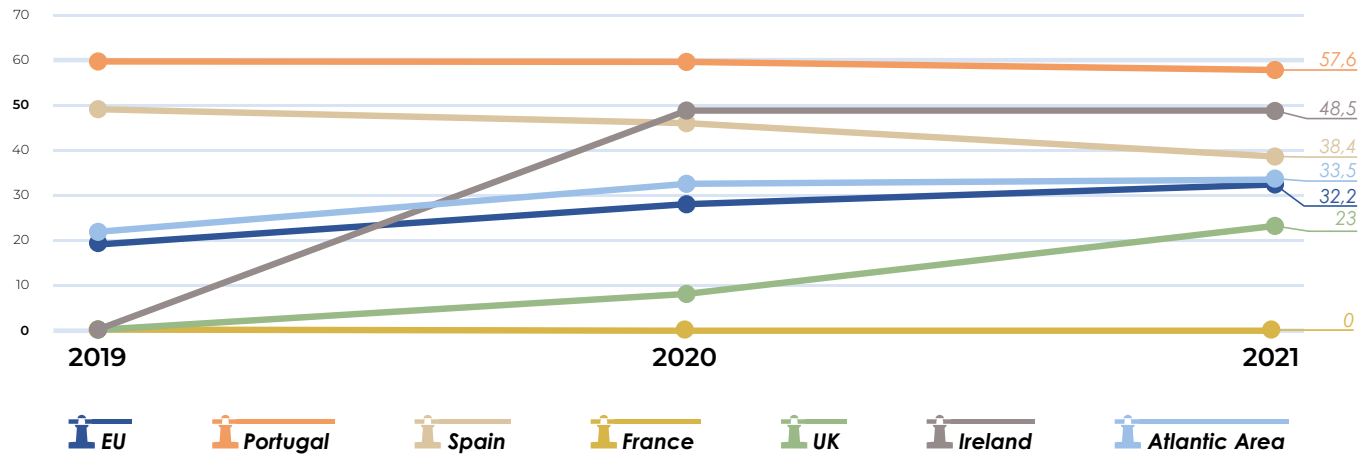


Figure 17. **Cable modem DOCSIS 3.1**
Source: Own Elaboration

Comparing the two types of cable modems, in 2021, the AA countries with equal usage of DOCSIS 3.0 and DOCSIS 3.1 were Portugal (57.6% vs 57.6%), Ireland (48.6% vs 48.5%) and Spain (38.4% vs 38.4%). In the UK, DOCSIS 3.0 was used more (50.3% compared to 23%). France, on the other hand, only reported DOCSIS 3.0 usage with a low percentage of 23.1%, meaning that DOCSIS 3.1 cable modem has not yet been adopted (Figure 18). Therefore, of the five countries in the AA, Portugal has been the country with the highest adoption of both high-speed cable modems. It was also the country that had fully adopted these two types of cable modems.

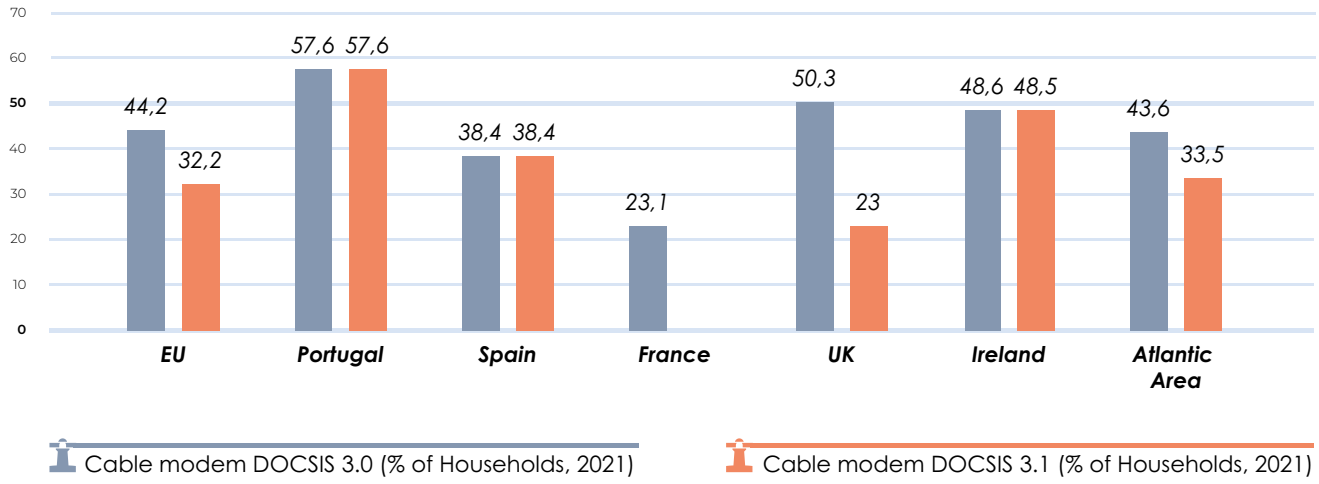


Figure 18. **DOCSIS 3.0 vs. DOCSIS 3.1** *(% households, 2019-2021)*
Source: Own Elaboration

It can be seen that the use of high-speed broadband (NGA) was more widespread in the AA (90.5% compared to 38.6%) and in the EU (90.1% compared to 38.2%) than the use of high-speed cable modems.

4.2.3. Mobile Broadband

Regarding *'5G Coverage'*, it refers to the percentage of households covered by 5G. In one year, between 2020 and 2021, this indicator has increased significantly in all AA countries, with an average of 47%, an increase of 35.98% (47% versus 13%). As far as the EU is concerned, a significant increase of 51.9% was observed (Figure 19).

Due to the recent launch of 5G in Portugal, the country does not present any figures for 2020-2021. As for France, 5G household coverage was not recorded until 2021.

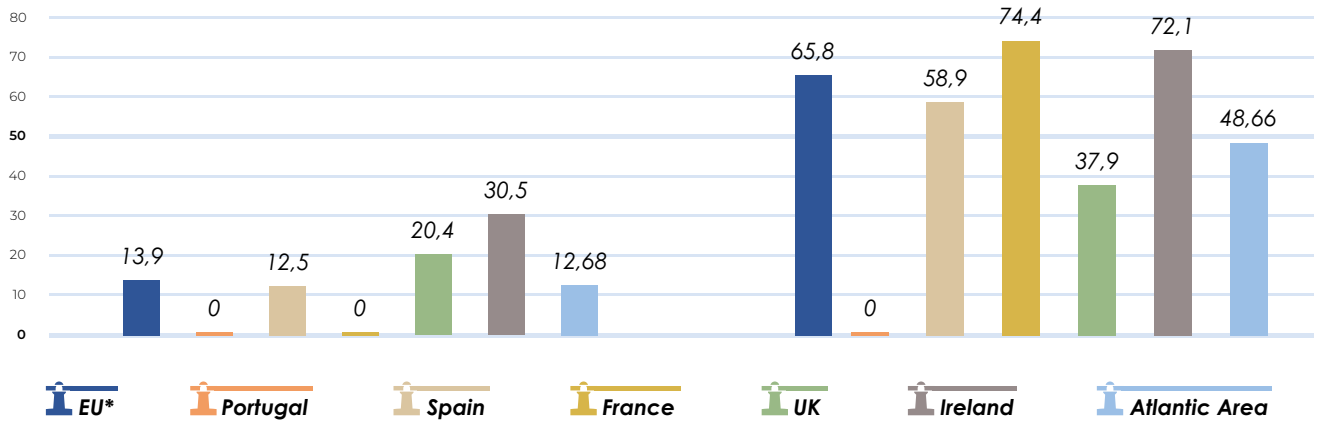


Figure 19. **5G coverage** *(% households, 2020-2021)*
Source: Own Elaboration

As for the *'use of the internet on a mobile device'*, this indicator refers to the percentage of individuals using the internet on a mobile device. Between 2012 and 2019, there was a sharp increase in the use of the internet on a mobile phone in all countries of the AA, which in turn registered an increase of 37.3% (43.5% versus 80.8%) - Figure 20.

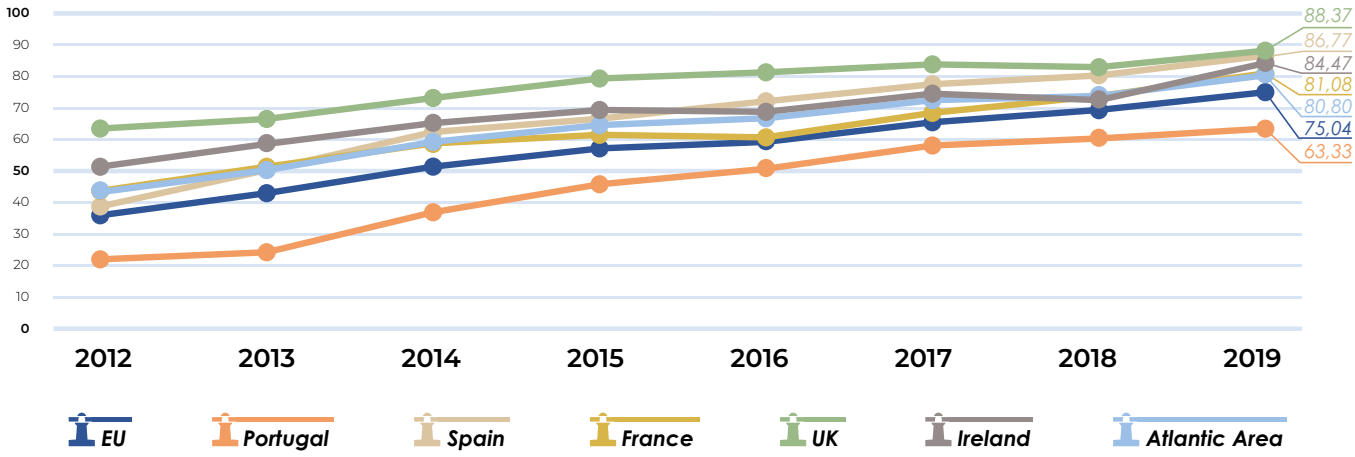


Figure 20. **Internet use on a mobile device** *(% of individuals, 2012-2019)*
Source: Own Elaboration

The UK has been the main performer over the years, with an increase of 30% between 2012 and 2019. Portugal, despite being the country lagging furthest behind in previous years, has recently made significant progress, almost reaching the EU level by 10%.

4.3. Integration of Digital Technology

4.3.1. Digital intensity

The percentage of enterprises (with 10 or more persons employed) with a high digital intensity index corresponds to *'SMEs with at least a basic level of digital intensity'*. It is important to underline that a basic level of digital intensity requires the use of at least 4 technologies.

In 2021, among the five countries of the AA, the UK[3] had the highest percentage (70.5%) of enterprises with at least a basic level of digital intensity. In particular, the UK had the highest share in comparison with the EU, as well as with the other AA countries (Figure 21).

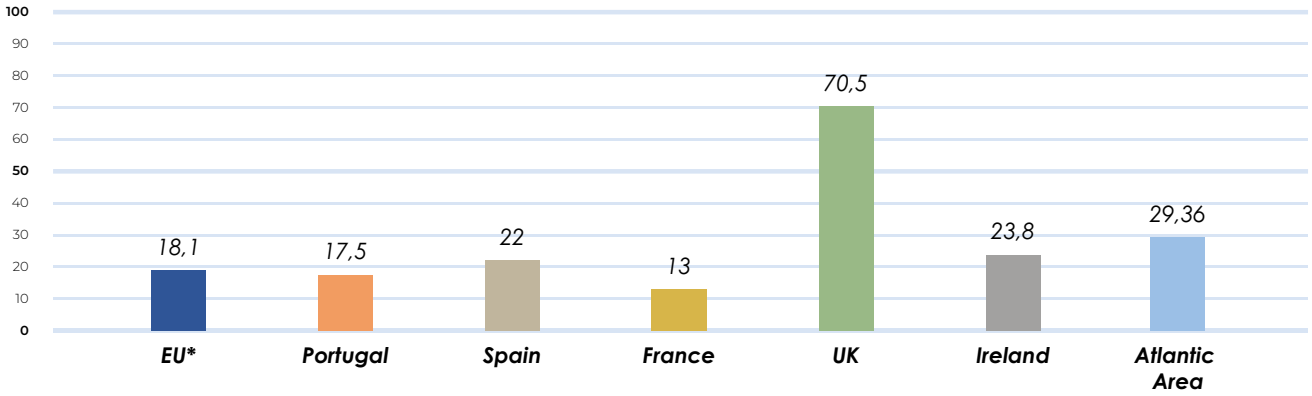


Figure 21. **SMEs with at least a basic level of digital intensity** *(%, 2021)*
Source: Own Elaboration

This evidence shows that the UK has been the most agile country in the transition to the digital world, with a remarkable proportion of SMEs with at least a basic level of digital intensity (using at least four technology tools). In contrast, the other countries of the AA, and even the EU as a whole, are still struggling to adapt to this increasingly digital and fast-moving environment. These data thus confirm the existing disparities between countries in adopting technologies related to the digital economy (Figure 21).

4.3.2. Digital technologies for businesses

'Enterprises using IoT' refers to the percentage of companies using the Internet of Things (IoT - connected devices or systems that can be remotely monitored or controlled over the Internet). In 2021, Ireland had the highest share, with 34% of enterprises using IoT in 2021, followed by the UK (29.5%) and Spain (27.5%). It is also evident that the average of the five countries forming the AA (27.3%) was very close to the EU average (28.7%), which covers 27 countries (Figure 22). However, there were still few enterprises using IoT in all countries of the AA and in the EU in general.

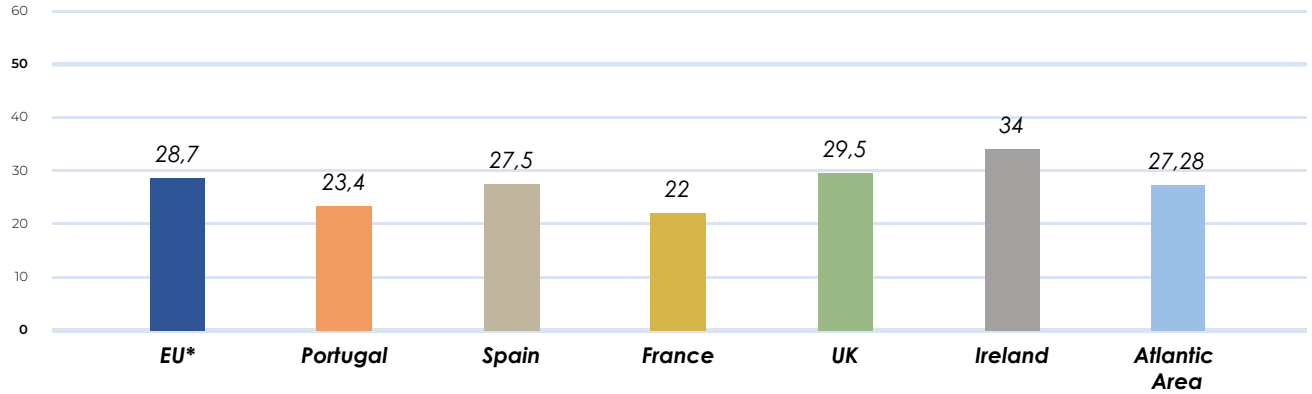


Figure 22. **Enterprises use IoT** *(%, 2021)*
Source: Own Elaboration

[3] Cf. ERC (2021).

The indicator *'Enterprises using any social media'* measures the percentage of enterprises using any social media. From 2015 to 2021, the use of social media in enterprises increased in all countries of the AA. However, Ireland slightly decreased between 2019 and 2021, from 71.1% to 63.7% (Figure 23). Therefore, if we compare this figure with the previous one, we can see that social media use has been more prevalent in businesses than IoT devices.

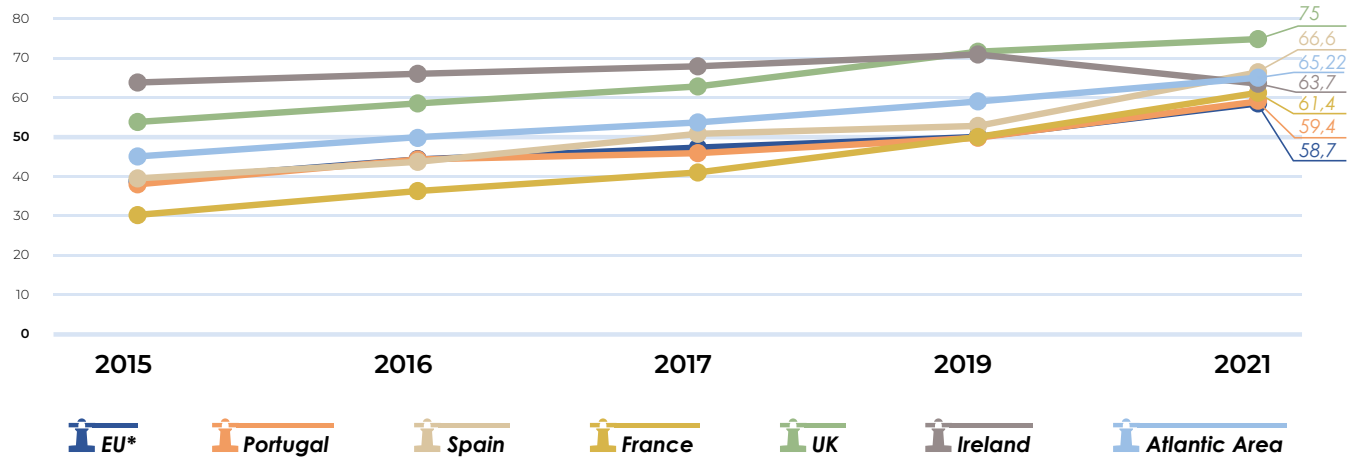


Figure 23. **Enterprises that use any social media** *(%, 2015-2021)*
Source: Own Elaboration

In 2021, all countries covered by the AA were more or less at the same level. Nevertheless, the UK had the highest share, with 75% of enterprises using any social media, followed by Spain (66.6%) and Ireland (63.7%). Portugal, on the other hand, was the country in the AA with the lowest share (59.4%) (Figure 24). Nevertheless, this country still ranks above the EU average.

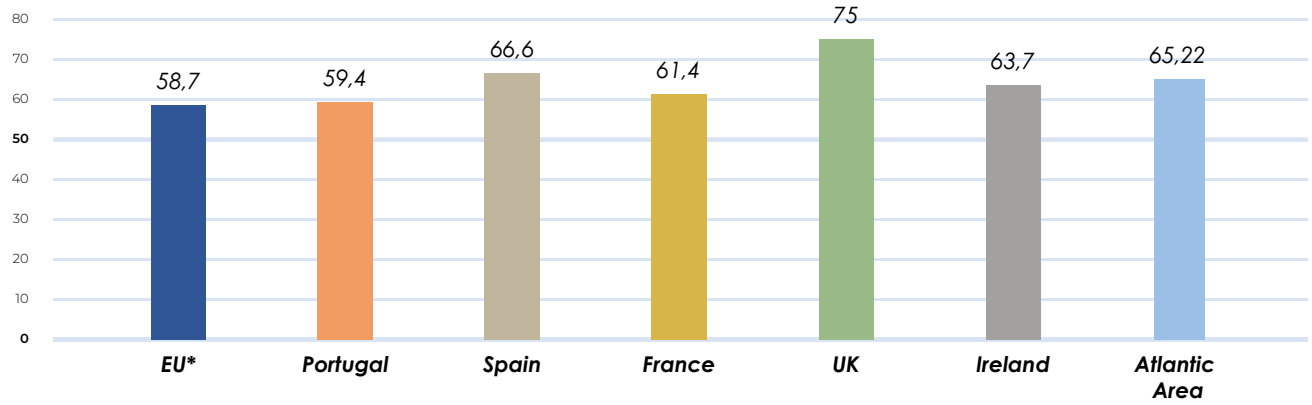


Figure 24. **Enterprises that use any social media** *(%, 2021)*
Source: Own Elaboration

Digitalisation is becoming more widespread in the business world. However, advanced digital technologies are not being used as much as they could be. According to the proposed Path to the Digital Decade, at least 75% of enterprises should start using AI and big data technologies by 2030.

In the case of *'Big Data'*, this refers to the percentage of businesses analysing large amounts of data internally or externally, using technologies, techniques or software tools such as data or text mining and machine learning. In the case of *'AI technology'*, it is the percentage of companies using artificial intelligence technologies.

In the AA, only 18.2% analysed big data and 10.9% used AI technology between 2020 and 2021. It should be noted that enterprises in France (21.7% vs. 6.7%), the UK (26.9% vs. 15%) and Ireland (22.7% vs. 7.9%) use big data analysis more than AI technology. Conversely, businesses in Portugal have been using more AI (17.3%) than big data analysis (10.6%).

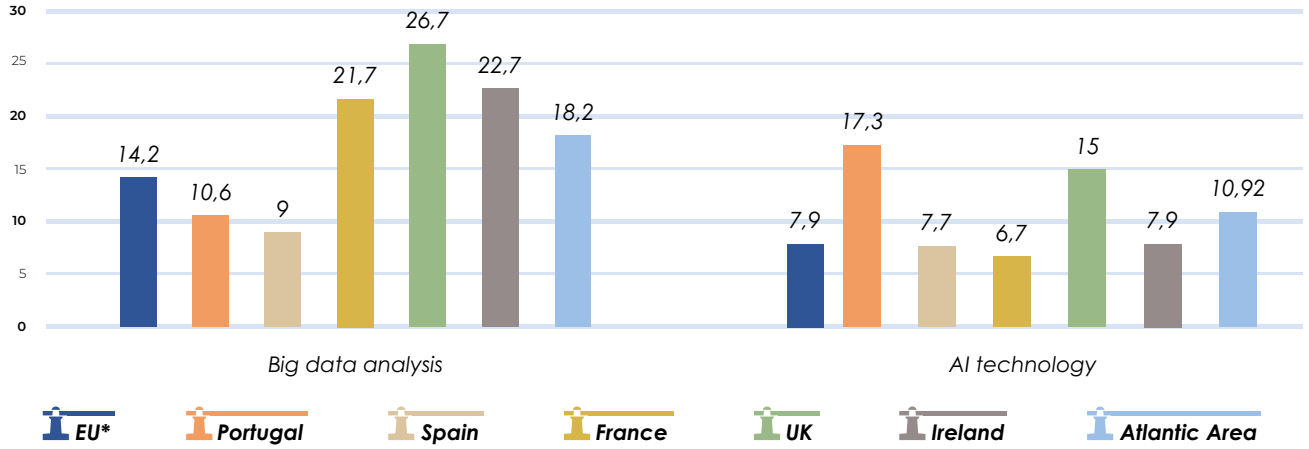


Figure 25. **Adoption of advanced technologies, Big Data and AI** *(%, 2020-2021)*
Source: Own Elaboration

In the AA, Spain had the lowest percentage of enterprises using advanced technologies in terms of big data analytics and AI technology (9% and 7.7%, respectively) - Figure 25. Thus, to reach the percentage of enterprises using any social media proposed by the Path to the Digital Decade, the countries of the AA still have a long way to go.

4.3.3. e-Commerce

Comparing the percentage of *'enterprises selling online'* (with e-commerce sales of at least 1% of turnover) between 2013 and 2022, the most outstanding countries in the AA were Ireland, the UK and Spain. The country with the lowest growth rate was France. It has been declining since 2019 and has stabilised in the last two years. Spain had an outstanding pace. In terms of the existence of enterprises selling their products and/or services online, the AA has outperformed the EU from 2013 to the present (Figure 26).

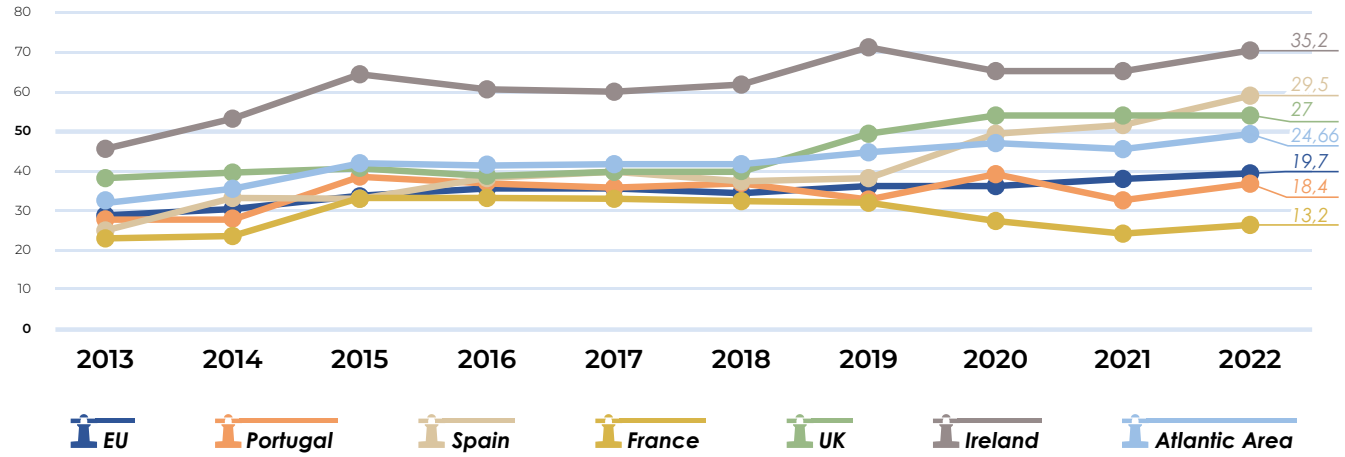


Figure 26. **Enterprises e-commerce sales** *(% of enterprises, 2013-2022)*
Source: Own Elaboration

In 2022, with a percentage of 35.2%, Ireland was the AA country with the highest number of companies selling online, followed by Spain (29.5%) and the UK (27%). Meanwhile, France (13,2%) had the lowest number of businesses selling online, followed by Portugal (18,4%) (figure 27). Even so, the countries assessed have a long way to go, since there are still many companies not selling online, according to the latest available data.

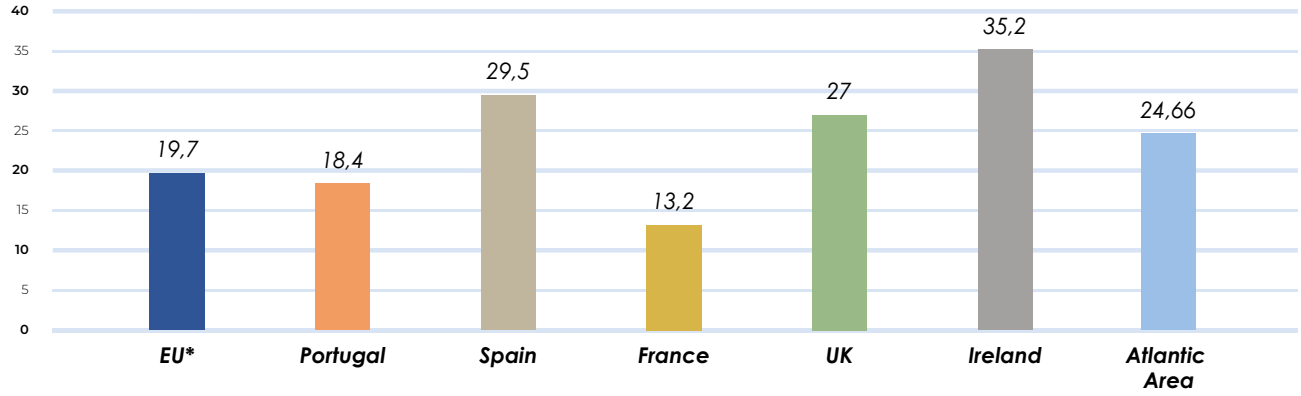


Figure 27. **Enterprises e-commerce sales** *(% of enterprises, 2022)*
Source: Own Elaboration

In terms of *'businesses selling online across borders'* in the AA, the pace of development in each country has been inconsistent and its nature unclear. - Figure 28. However, it is noteworthy that Ireland experienced a significant decline of 6.8% between 2019 and 2021.

According to the DESI (2022b, p. 63), e-commerce across borders benefits enterprises through the exploitation of economies of scale. It reduces costs, increases efficiency, improves productivity and fosters competitiveness. Cross-border e-commerce is even more important for enterprises and SMEs with limited domestic markets.

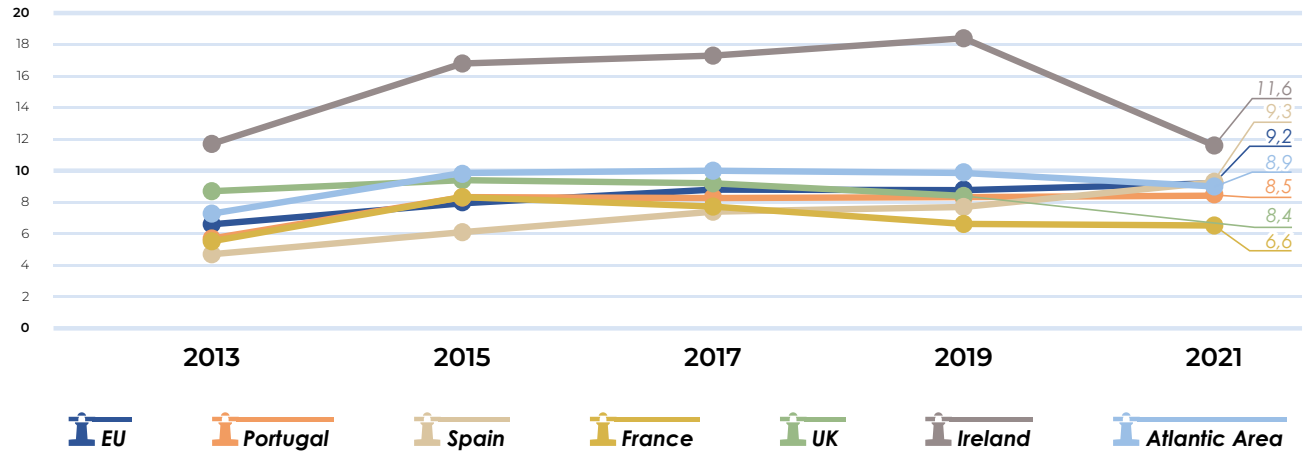


Figure 28. **Enterprises sales online cross-border** *(%, 2013-2021, bi-annual)*
Source: Own Elaboration

Despite slight improvements in the rankings of the AA and the EU, there are still very few enterprises with online sales across borders. In 2021, Ireland had the highest percentage of companies selling across borders with 11.6%, followed by Spain (9.3%), Portugal (8.5%) and the UK (8.4%). Meanwhile, France (6.6%) was the country in the AA that was lagging furthest behind - Figure 29.

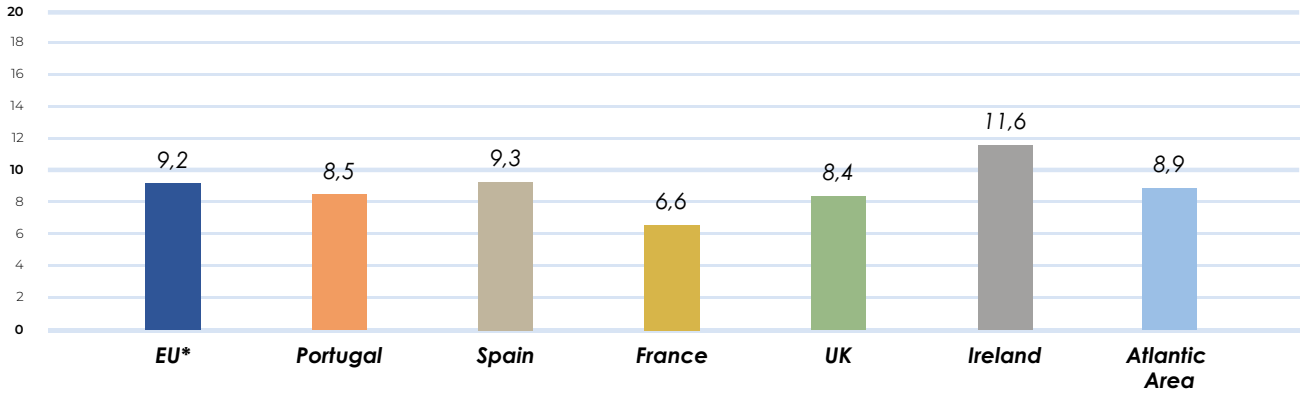


Figure 29. **Enterprises sales online cross-border** *(%, 2021)*
Source: Own Elaboration

In general, many enterprises still have difficulties in selling their services/products online to other countries. In the DESI report (2022b), some SMEs reported at least one barrier, mainly related to economic factors (e.g. high delivery or product return costs). Difficulties in selling online to other EU countries were also highlighted as problems related to complaints and disputes and limited knowledge of foreign languages.

4.4. Digital Public Services

4.4.1. e-Government

Public services have become increasingly available online over the last decade. This has been accelerated by the COVID-19 pandemic, making digital interactions more common.

In terms of the percentage of *'individuals interacting with public administrations via the internet'*, there is an upward trend in all AA countries, with Ireland showing the largest growth between 2020 and 2021. Meanwhile, the country with the slowest growth between 2013 and 2021 has been Portugal (Figure 30).

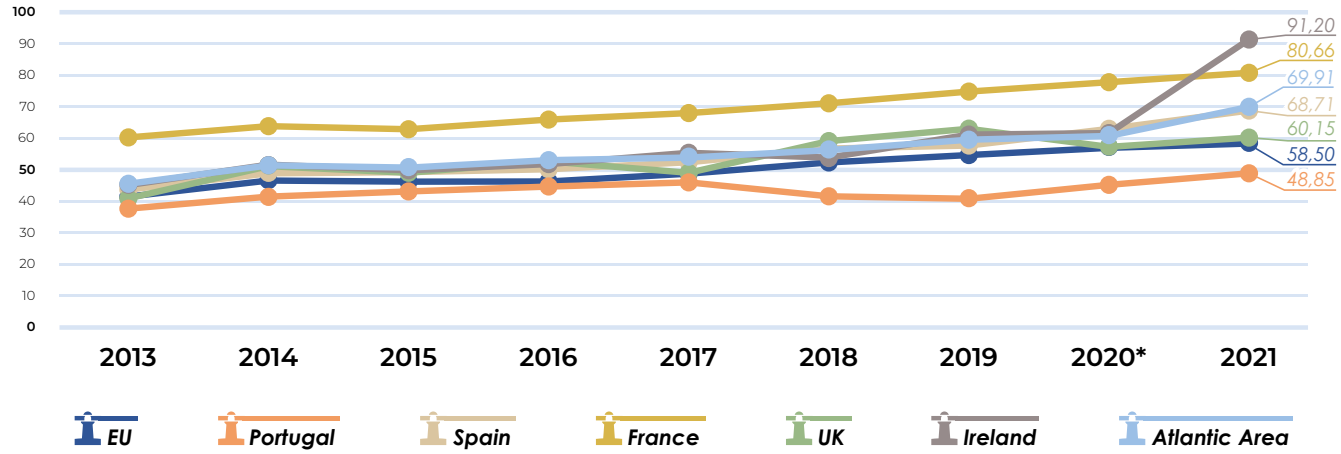


Figure 30. **e-Government Users** *(% individuals 2013-2021)*
Source: Own Elaboration

In particular, in 2021, Ireland remained the country with the highest share (91.20%), followed by France (80.66%) and Spain (68.71%). Among the countries of the Atlantic Area, Portugal was the only one with a share below 50%. The UK was the second country with a low percentage of e-Government users (Figure 31). In general, a high proportion of individuals interacting with public administrations online can be observed in all countries analysed.

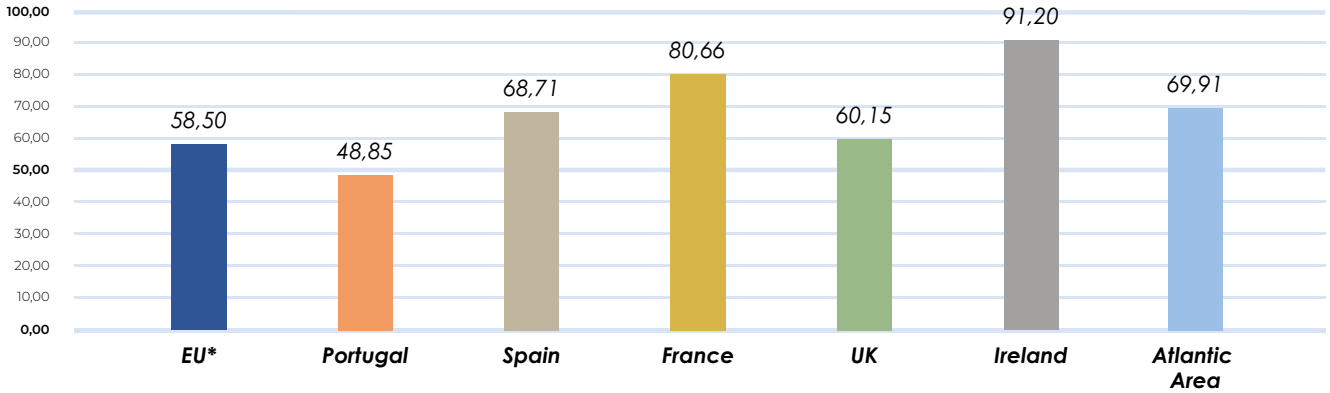


Figure 31. **e-government users** *(% individuals, 2021)*
Source: Own Elaboration

There are two types of public services: those that are provided to citizens (1) and those that are provided to enterprises (2). In this case, it was decided to compare only the user-centricity and the cross-border services provided to citizens and to enterprises.

'User-centricity' indicates the extent to which (information about) services are provided online, how online travel is supported, and whether public websites are suitable for mobile phones. *'Cross-border services'* are an indicator of the extent to which citizens have access to online services in another country. While for citizens these indicators relate to the performance of e-Government in relation to policy priorities, for businesses they relate to the performance in relation to life events (domains). The latter covers

16 services, both mandatory services and information needs, that enable the entrepreneur to start a business: advice, administrative and registration requirements, and tax and insurance issues.

Regarding the former, in 2021, except for Spain, all AA countries had higher user centricity scores for companies than for citizens. Nevertheless, in both user centricity for citizens and for businesses, the five countries had scores of over 90%.

In terms of user centricity for businesses, Ireland and Portugal were the countries with the most outstanding scores in 2021 (100 and 99 respectively), followed by the UK (97), France (97) and Spain (95) (figure 32). In turn, Spain (96) and Portugal (95) were the two countries with the highest scores for user centricity for citizens, closely followed by France (94) (Figure 32).

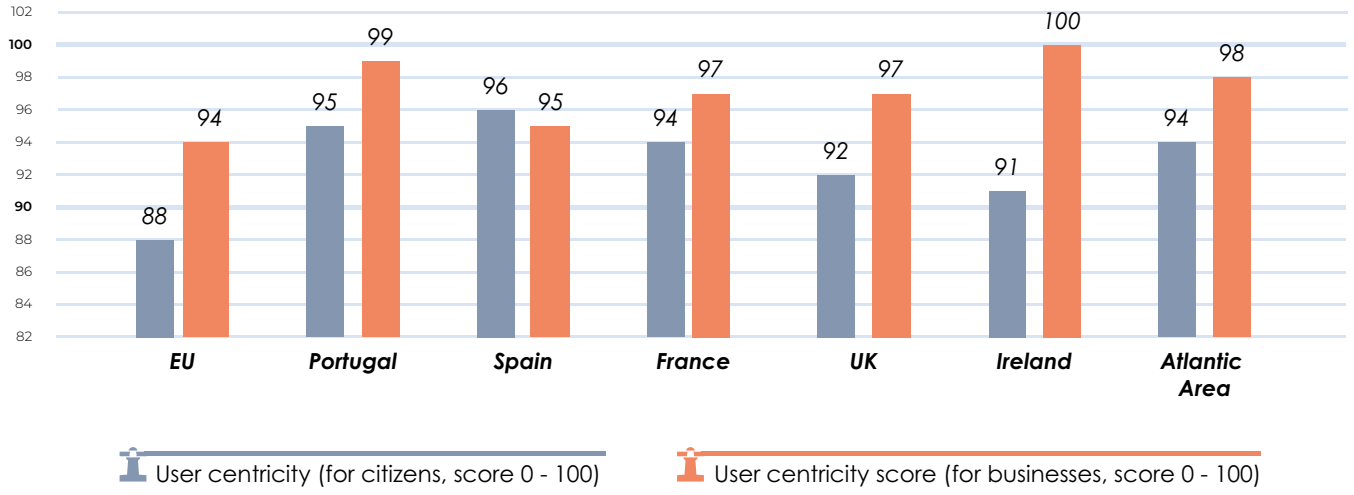


Figure 32. **User centricity** *(for citizens vs. for businesses, score 0-100, 2021)*
Source: Own Elaboration

With regard to the *'Cross-border services'* indicator, the scores of all the countries in the AA were highlighted in the area of cross-border services for enterprises, where the average score for the AA was 84, compared to cross-border services for citizens, where the average score was 63. For the former, Portugal was the best performer scoring 92 points. For the latter, all countries scored between 60 and 70 points. The exception was France, which scored 46 points (Figure 33).

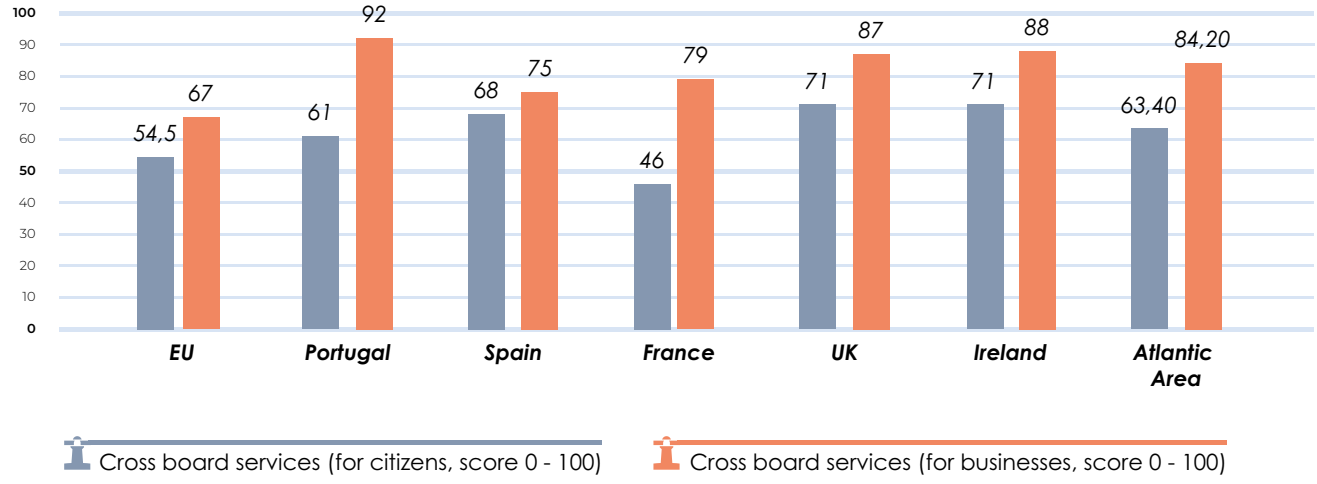


Figure 33. **Cross-board services** *(for citizens vs. for businesses, score 0 to 100, 2021)*
Source: Own Elaboration

Thus, in the majority of countries in the AA, online public services have been given preference to businesses over citizens in terms of user-centricity and cross-board services. However, there have also been notable figures for citizens.

CONCLUSIONS

CONCLUSIONS

Social innovations are developed and proposed by various types of organisations, stakeholders and individuals. These innovations, driven by a social purpose and social benefit, are often implemented through the use of advanced IT technologies, intelligent machines, artificial intelligence (AI) and other new technologies, which are being widely seen as enablers for meeting society's diverse needs.

Due to Covid-19, the modern world has experienced significant transformations. The recent pandemic has highlighted the importance of digitalisation. As people became confined to their homes, there was a paradigm shift with many people starting to work from home using digital tools. As a result, employment is becoming increasingly non-localised and distributed across different places. Currently, the employment landscape has been reshaped, with employees and employers being viewed differently, as well as territorial opportunities.

Digitalisation is impacting every aspect of human life through online presence, data, and information exchange between devices and individuals. However, while digitalisation opens up a wide range of opportunities in all areas of human life, as organisations adapt to a broader model of remote working and the delivery of public services to citizens, it is important to remember that societies and individuals who are not digitally literate are unprepared to take full advantage of this technological revolution.

This report aimed to provide an overview of the structural conditions for digitisation in the Atlantic Area (AA) countries. To this end, a secondary dataset was collected to analyse and compare digitalisation trends within the AA. For most of the indicators analysed, the AA are more or less on a par with the EU. However, the AA has outperformed the EU on some indicators.

In the dimension of human capital, as regards the sub-dimension of digital literacy, the AA has shown the best performance, particularly in terms of the percentage of people with basic or above basic skills.

In the connectivity dimension, more specifically in high-speed cable modem, the AA was the one with the highest average in DOCSIS 3.1 adoption (despite the fact that France has not yet adopted this type of high-speed cable modem). Over the years, the AA has also shown an increase in the percentage of people using the internet on their mobile phones above the EU average.

Furthermore, in the dimension of digital technology integration, the AA stood out in 2021 in terms of the percentage of SMEs with a basic level of digital intensity. More AA enterprises use social media, use advanced technologies, sell products/services online and sell across borders than in the EU (although the EU outperformed AA by 0.3% last year).

As for the last dimension, digital public services, according to the e-Government users' indicator, the AA stood out in 2021 compared to the EU, with a difference of 11.41%. Furthermore, the AA offers more online public services to both citizens and businesses. However, the AA and the EU have given more priority to businesses.

In general, both the AA and the EU still have low levels of digital literacy, a general shortage of ICT professionals and very few businesses selling online across borders. There is also evidence that digital governments in both the AA and the EU provide a wide range of services to a diverse group of individuals, but entrepreneurs and businesses are better served online than citizens. For entrepreneurs, digital services are more likely to be available online than they are for citizens. Therefore, there is a need for digital governments that are inclusive and meet the needs of both citizens and businesses.

From the macro-level analysis carried out, it was possible to evidence that the Atlantic Area has been improving its digital performance. However, there are still countries that are lagging behind. While the United Kingdom, Ireland and Spain were the top performers in most of the indicators analysed, Portugal and France were the laggards.

However, it should be noted that Portugal has picked up the pace and is catching up with, if not outperforming, other countries in the AA, in some cases taking a prominent position in the take-up of high-speed cable modems and the provision of cross-board online services for businesses. As for France, it has shown remarkable speed in the interaction of individuals with public administrations online and even in user-centricity and cross-board services, especially for businesses, thus occupying a dominant position by 2020.

This statistical overview confirms that digitalisation does not reach everyone, neither individuals nor countries. It may be even another factor that increases inequalities in the growth and development of countries.

In an increasingly digital world, we stressed the need to develop effective strategies to promote the adoption of technologies not only by citizens with different physical, psychological, intellectual and financial conditions, but also by large, medium and small businesses. This will ensure that everyone has access to the same opportunities to improve their well-being.

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