GUIDELINES

# Digital Agenda of Emilia-Romagna 2020-2025

# Data Valley Bene Comune

## Preface

This document was developed within the framework of the Emilia-Romagna Digital Agenda, which, in turn, falls within the tasks of the Cabinet of the President of the Regional Council of Emilia-Romagna headed by Andrea Orlando.

The working group that prepared this document is formed by: Dimitri Tartari (coordinator), Massimo Fustini, Barbara Santi and Giovanni Grazia from the Emilia-Romagna Region; Giuseppe Sberlati, Sandra Lotti and Antonio Iossa from LepidaScpA; Marina Silveri, Lucia Mazzoni and Rita Trombini from ART-ER.

The document incorporates contributions and feedback given by the Scientific Committee for the Emilia-Romagna Digital Agenda, whose members are: Piera Magnatti (chair), Luciano Baresi, Sonia Bergamaschi, Fabio Maccaferri, Mauro Moruzzi, Giovanni Pau, Andrea Prati and Cesare Stefanelli.

The document takes into account the contributions, considerations, suggestions and insights gathered during the meetings with the coordinators and all the participants in the Thematic Communities of the Emilia-Romagna Community Network (CN-ER). It was also shared - again with a view to receiving their input - with the stakeholders of the regional innovation ecosystem: the CLUSTER Associations, the laboratories and innovation centres of the Emilia-Romagna High Technology Network, the MAK-ER Association, the Open Laboratories, the BI-REX Competence Centre, the Big Data Association, the Technopoles. In the period between 11 November 2020 and 18 December 2020, 4 meetings were held with the regional administrators in order to present the document and collect further contributions.

As a first step in the process of inter-departmental coordination for digital innovation, meetings were held with all Regional Councillors to identify the strategic priorities of the individual departments and to share an initial set of actions that were consistent with the Digital Agenda 2020- 2025.

On a technical level, the document was shared with the Digital Controlling Body - which is represented by all the General Directors of the Region, the Regional Institutes, Agencies and in-house Companies - on 30 October 2020.

The document received a positive opinion from the Council of Local Authorities (CAL) on 3 November 2020 and was shared with the Standing Working Party of the Community Network of Emilia-Romagna on 4 November 2020 (in a session extended to all the public bodies that are present in the regional territory).

# Index

**The health emergency and the economic crisis have made it even more urgent to speed up the pace on innovation and digitalization as fundamental elements of a change that must affect the entire regional society, for a more sustainable growth, increased employment, democracy, equality, ethics, justice and inclusion.**

# Vision

**Stefano Bonaccini**
President Emilia-Romagna Region

Never before has Emilia-Romagna been so ready and determined to embrace the digital revolution. The Pact for Work and Climate signed on 14 December 2020 is among the cross-cutting pillars that are required to generate new sustainable development. It clearly states that the digital transformation of the economy and society starts from three essential components: infrastructure, right of access and people's skills.

We are the Data Valley where the Bologna Technopole is based, but we are also the Region whose award-winning Digital Agenda is largely recognized as having a broad impact throughout the regional territory. At national level, it holds the record for broadband coverage of even small municipalities and schools.

The goal of the new Emilia- Romagna Digital Agenda – whose title is 'Data Valley Bene Comune (Common Good)' – is to combine excellence in computing capacity and research on the one hand, and digital inclusion on the other.

Building a Data Valley that is 'Common Good' means a lot, including fostering participation and democracy, helping to overcome gender inequalities, designing new services starting from people's concrete needs, averting the social and territorial polarization that technology might generate, and transforming intangible assets – i.e. data - into a community asset, into new science, new enterprise models and new forms of work. The technological revolution has already profoundly changed the manufacturing processes: our ambition is to control the transformation so that it does not result in the replacement of jobs, but rather helps redesign a 'digital-augmentation' world of work, in which automation generates new employment and opportunities.

We therefore intend to strengthen the digital transformation of the economic system as well as that of the public administration and society as a whole through coordinated actions by all the members of the Regional Council. This transformation should not translate into marginalization, as was all too often the case during the pandemic, but should become a real instrument of democracy and a driver of competitiveness and cohesion, both at social and territorial level: in other words, 'a common good'.

# Mission

**Paola Salomoni**
Councillor for schools, universities, research and the digital agenda
Emilia-Romagna Region

The Digital Agenda outlines the strategy with which the Emilia-Romagna Region intends to support digital development throughout its territory and within its society in a process geared towards excellence and inclusion, promoting a regional digital ecosystem that enhances opportunities for economic development and social integration.

We continue to qualify as the Data Valley - the place of the most innovative technologies - but we also want to become the region where widespread and inclusive digital capabilities, resources and skills support sustainable development and guarantee opportunities for all citizens, in all areas of the region. We must build on the momentum that the digital transformation has had during the months of the pandemic, to continue enhancing and working on all its positive aspects. At the same time, however, we must take action to ensure that digital technologies - in terms of infrastructure, skills, opportunities for growth and innovation - are a democratic and inclusive tool and by no means a reason for further isolation. In order to achieve this goal, the Agenda integrates and harmonises all the actions in the digital sphere that the Regional Council has already provided for in the Regional Government Programme and has further strengthened through the Pact for Work and Climate. These range from digital technologies in culture to precision farming, from digital support to territorial control and telemedicine, passing through digital innovation in tourism and trade and, more generally, in the manufacturing system and in the Public Administration. The first step in this direction will be the development of a regional Data Strategy, in line with the European one, which will increase data collection from the territory with the contribution of all local bodies with a public goal, i.e. to enable the use of big data for the creation of innovative and customizable services, for streamlining the procedures, but also for the development of decision-making tools and data-driven policies. A fundamental pillar in this transformation is certainly the infrastructure, which must be present and equally distributed throughout the territory. Above all, however, it is the advanced technological skills, which are indispensable to guide and give technological strength to the digital transformation, and the collective skills which are fundamental to take us into a future regional society that is digitally aware, resilient, and capable of taking advantage of the new services and opportunities that we will make available.

# The Regional Council

## Elly Schlein

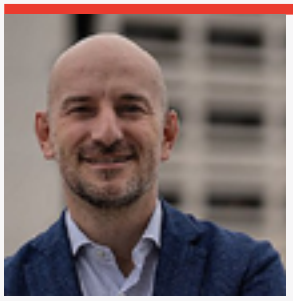
Councillor for the Fight to inequalities and the ecological transition: Pact for Climate, welfare, housing policies, youth policies, international development cooperation, international relations and relations with the EU

**Increasing digital skills, exploring the potential of new technologies to put innovation at the service of people and communities, to better understand their needs and develop more effective and integrated responses are priorities for this region.**

## Davide Baruffi

Undersecretary to the Presidency of the Regional Council

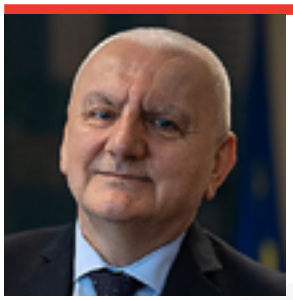
**Connectivity for citizens and businesses is currently a fundamental need over the whole regional area. The Digital Agenda must therefore coordinate private and public interventions to guarantee access to the Internet for all.**



## Paolo Calvano

Councillor for budget, human resources, heritage and institutional reorganisation

**In order to speed up the implementation of investments, it is necessary to act on the simplification of administrative action, the speeding up of administrative procedures for access to services and the digital transformation of public administration.**



## Vincenzo Colla

Councillor for economic development and green economy, employment and training

**In the new Pact for Work and Climate, we have clearly identified widespread digitalization as a strategic goal, both in terms of upgrading the infrastructure and in terms of business innovation and upgrading workers' skills. My councillorship will invest decisively in a new deal of knowledge, with the aim of eliminating the digital divide that might widen the gap between the few who have IT skills and the bubble of poor labour.**

## Andrea Corsini

Councillor for mobility and transport, infrastructure, tourism and trade

**The digitalization of local public transport is one of the priorities of our mandate. On the other hand, once the health emergency is over, it will also be crucial to reprogramme our Region's tourist promotion on the national and international markets, so as to make the most of digital technologies for targeted and widespread market penetration.**

## Raffaele Donini

Councillor for health policies

**In our region, scientific and technological innovation plays a fundamental role; in particular, translational research and technological innovations in the biomedical sector with the contribution of machine learning and artificial intelligence techniques are continuously providing the health care system with innovative potential, which must be grasped and rationalized in order to produce the best results in terms of quality of patients' care.**

## Mauro Felicori

Councillor for culture and landscape

**2020 saw the establishment of digital libraries, the use of platforms for film distribution, a growing number of live-stream concerts with a huge number of viewers and – though to a lesser extent – online museum activities. This confirms that digital technologies are at the heart of the future cultural policies of our Region.**

## Barbara Lori

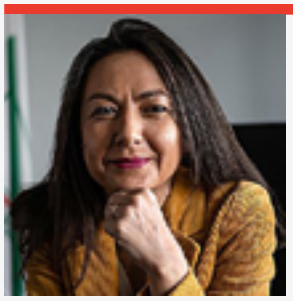
Councillor for mountains, inner areas, territorial planning and equal opportunities

**Digital transformation means breaking down distances, increasing the quantity and quality of services in the most remote areas, starting with the mountain ones, and expanding opportunities for residents, whether students or workers.**

## Alessio Mammi

Councillor for agriculture and the agri-food system, hunting and fisheries

**The digital transition is central to agricultural production, precision farming, varietal diversification and water saving. Never before has it been possible to have as many monitoring opportunities as we have today in our fields and crops.**



## Irene Priolo

Councillor for the environment, soil and coastal protection and civil protection

**Digital Agenda also means access to data, right to information and knowledge. It means making the citizenship aware of Region's commitment to territorial and environmental security for which we are accountable.**

# Strategy

The Emilia-Romagna Region has long invested in innovation and digitalization. This is witnessed by the choices made and the results obtained both by the public administration (3rd place in the 2019 edition of the Digital Economy and Society Index - regional DESI- instituted by the Digital Agenda Observatory of the Politecnico di Milano) and the private sector (3rd place in the 2020 edition of the SME Digital Index 2020 compiled by GoDaddy) in recent years.

Public and private entities have worked together to implement a network infrastructure that is as inclusive as possible, making common platforms available for the provision of up- to-date and secure services. They have implemented advanced digital solutions in health care services, transportation and, more generally, in the relationship between the citizens and the public administration. The same efforts were made by the regional training and education system, which for some time now has prepared for the on-going digital revolution (see the Digital Skills Observatory 2019 report by Aica, Anitec-Assinform, Assintel, and Assinter Italia) by improving the skills of those who will soon enter the job market, as well as of those workers who need reskilling in view of the upcoming new industrial era. In the past programming period, innovation and digitalization played a key role in achieving the objectives of the Pact for Work and Climate.

**The health crisis resulting from the COVID-19 pandemic** and the lockdown period have challenged the entire national and regional socio-economic context, highlighting even more, if ever possible, the need to digitally reconsider the society and the economy as well as to accelerate, also at regional level, all digital transformation processes because of the broad dissemination of technologies and skills.

**One should start from the results obtained** in order to develop a digital innovation ecosystem based on the cultural change which is taking place in the society of Emilia-Romagna: it is a matter of making digital technologies a **new 'typical product' of our area**, with a view to using technologies to collect, manage and extract **value from data**. A cross-cutting asset, which involves all spheres of our lives and of governance, research and production, helping us govern better, produce innovation, safeguard the environment and promote the objectives set out in the Pact for Work and Climate.

Emilia-Romagna must turn from an 'Excellence-oriented Data Valley' to a 'Collective Data Valley', in which data are common goods, collectively protected and cared for. This approach has led to a strategy called **Data Valley Bene Comune** (Common Good) (DVBC). Its very name emphasizes that this new asset (the data) and the opportunities connected to it must be made available to all. A common good is in fact **an asset that is shared by every member of a specific community**: a collective property available for public use.

**The DVBC vision** is based on the strategy set forth in the **Regional Council's** 2020-2025 **Mandate Programme**: it is a political choice that points to digital transformation as a fundamental cross-cutting element, which is common to all 'vertical' policies by involving and strengthening the existing ecosystem of companies, research, associations and public administration.

Digitalization is present in all spheres of government, both as an asset and as a solution: we are an **interconnected region** needing to expand our infrastructure to collect data from the entire territory, interpret them with an overarching approach, use them for decision-making purposes and new service provision. In our region we use technology for a more sustainable agricultural production, for monitoring the local territory and the environment, for strengthening our points of excellence and supporting trade, tourism and internationalization, for vitalizing cultural life, bringing it closer to young people, offering artists unexpected creative opportunities. **The Pact for Work and Climate** identifies digitalization as an urgent need, recognizing that **widespread and pervasive digitalization of the economy and society** is a necessary condition that relies on three essential pre-requisites: infrastructure, the right of access and people's skills. Access is thus to be understood as a new essential public service, a service that should be universal and therefore guaranteed to all.

The Regional Government Programme focuses on the **value of proximity and reducing territorial distances**. The challenge posed by proximity lies in the full participation of the entire regional society in the opportunities offered by the digital transformation. It is also about the full inclusion of all, overcoming old and new gaps. Emilia-Romagna must therefore transform itself into a single, widespread Data Valley where infrastructures, platforms, technologies, skills, data and applications are available to all and represent a common good that is a distinctive feature of our area.

Data Valley Bene Comune (Common Good) thus represents a point of arrival, a strategic objective for a society in which high performance computing (HPC) and high-level skills in the field of artificial intelligence and big data go hand in hand with basic and mid-level knowledge, technological infrastructures available throughout the territory, territorial networks and tools to promote proximity digital transformation in a widespread and well-distributed manner.

The public administration, starting with the regional administration, has an important role to play in this strategy: governing the process, acting as an incentive for the production and use of data by public and private entities, guaranteeing the ethics of data processing and storage. These are just some of the new challenges that the public sector is facing. For this reason, it is necessary for the public administration to transform itself digitally and begin to think and act in a completely digital logic. At the same time a cross-cutting strategic vision must be implemented that considers digitalization as the new asset for the regional economy and society; **data** are the central element for change and growth: **data-driven approach, integration and sharing of databases** are key words, as is the individual-centred approach and the need to work to strengthen the skills required for the use of data, starting with one's own.

In the Data Valley Bene Comune (Common Good) strategy, regional economic systems, companies and local supply chains will also be called upon to promote digital and green transformation processes. This will require accelerating the processes of **production, use, consumption and monetization of data** also by private entities, especially **small and medium-sized enterprises**. As a matter of fact, there will be no digital economy if small and medium-sized enterprises do not start to consider data and digitalization as the new asset available to the regional economy and society. The transformation of data is therefore central to

achieving higher levels of efficiency and productivity, as is the individual-centred approach and the need to work on strengthening skills for data use.

In order to support this transformation, it will be necessary to accompany this process with a **specific regional data strategy**, which on the one hand expands the collection of data on the territory - also through coordinated activities with other entities, with a necessary and shared prerequisite, i.e. attention to data quality and the necessary integration of different databases - but on the other hand identifies the actions that will allow the added value of regional big data to be returned to citizens, both through innovative and customizable services and by enabling the development of data-driven decision and policy support tools. The development of data collection and data use methodologies must in any case put people's interests first, in accordance with the fundamental values and rights of our democracy. In this respect, we are perfectly aligned with the European Union, which produced the EU Data Strategy in February 2020 and plans to implement a specific data law in 2021; in short, the EU will take steps to improve its governance structures for data management and expand its quality data pools available for use and re-use. This is the EU way of making better decisions, both at business and public sector level. In short, more data, used better and more extensively to produce better services, both in the public and private sector.

The goal stated at European level is to 'create a single European data space' - a true single data market, open to data from all over the world, in compliance with the European standards and values, in particular the protection of personal data. This implies an active role on the part of the public administration, changing from an expectant attitude to a more initiative-oriented approach. In this respect, the large amount of data already collected and processed by the Public Administration for purposes of general interest and according to the GDPR principles represent a powerful leverage for the public sector to take a proactive, friendly and competent approach 'towards' its citizens.

The concrete and proactive nature of this approach is what we intend to adopt in DVBC, too. It generates benefits, which affect the life of everyone: from more conscious energy consumption to the traceability of products, materials and food; from a healthier lifestyle to better health care. These expected outcomes are also described in our Mandate Programme. The first step will be to produce useful data for the areas to be developed, to find the right balance between the flow and large use of data and the need to maintain high levels of privacy, security and ethical standards: these are the aspects that our strategy will have to outline, aiming at developing an **active synergy with the EU**.

In order for this development to be truly democratic and inclusive, it is necessary to work so that the Region can guarantee **fundamental digital rights** to all those who wish to live and work in our area; a set of digital rights that encompass the concepts that characterize our idea of democracy in the digital sphere: right to network access, right to have and use one's digital identity and personal data, right to digital skills. Digitalization and, consequently, the DVBC must not be a source of further social inequality between those who have access (to the network, to the data and the digital identity) and skills and those who do not. The following general objectives should not be taken for granted: to improve the quality of life, to safeguard the attained levels of democracy and improve them, to include more and more citizens in the definition of our common destiny.

# DATAVALLEY COMMON GOOD

## SOCIETY / ENVIRONMENT / ECONOMY

The DVBC is an **amplifying strategy** that during our mandate will enable us to strengthen the elements that already characterize us – i.e. economic development and the quality of our health care system - and to work more effectively on problematic aspects such as the quality of the environment and the safety of the territory, to name just a few of the priorities of our Mandate Programme. The challenge of our current mandate will therefore be to transform the existing scenario into a true Data Valley as a Common Good with an economic, social and environmental impact.

We have therefore identified the main **challenges** to be faced and overcome. They are explored in more detail in the following chapters:


COLLECTIVE INTELLIGENCE DATA AVAILABLE TO THE TERRITORY


DIGITAL SKILLS: THE NEW INFRASTRUCTURE FOR SOCIAL AND ECONOMIC DEVELOPMENT

DIGITAL TRANSFORMATION IN THE PUBLIC ADMINISTRATION

DIGITAL TRANSFORMATION IN PRODUCTION AND SERVICE SECTORS

USER-CENTRED, INTEGRATED, AUGMENTED, SIMPLE AND SECURE DIGITAL PUBLIC SERVICES

MORE NETWORKS AND MORE NETWORKING FOR A HYPER-CONNECTED EMILIA-ROMAGNA

FROM MARGINAL CONTEXTS TO DIGITAL COMMUNITIES

WOMEN AND DIGITALIZATION: AN INDISPENSABLE ASSET

# Instruments

The implementation of the Data Valley Bene Comune (Common Good) strategy will be part of a regional **ecosystem** dedicated to innovation and digital development involving the private sector, the public sector as well as the third sector, to ensure homogeneous and organic development of the region. A complex system in which various actors play a key role:

- **University and higher education, vocational training and high school education.** Emilia-Romagna is home to 4 Regional Universities and 2 Universities from other regions with 160,000 students and several post-docs. In addition to this system, there is the network of Istituti Tecnici Superiori (ITS, Higher Technical Institutes), the network of vocational training institutes and the presence of more than 400 high schools. This systems is present in all provincial territories reaching out to a vast area.

- **ART-ER - Attrattività Ricerca Territorio (Attractiveness Research Territory) is the Emilia-Romagna Consortium** created to promote the sustainable growth of the region through the development of innovation and knowledge, attractiveness and internationalisation of the region. It promotes industrial research as the main driver of sustainable economic development, coordinates the regional innovation ecosystem (Rete Alta Tecnologia - High Technology Network -, Technopoles, Clust-ER, Spazi Area S3) and collaborates with business associations to develop strategies and joint actions between research and enterprises, to develop facilities and services for industrial research and to enhance the human capital involved in these areas. It provides support for regional programming and planning.

- **Clust-ER,** a community of public and private actors (research centres, companies, training institutions) sharing ideas, skills, tools, resources to support the competitiveness of the most important production systems in Emilia-Romagna. In the Clust-ERs, the research laboratories and innovation centres of the High Technology Network cooperate with the business and higher education system to form critical interdisciplinary masses, to increase opportunities and develop strategic planning with a high regional impact. The Clust-ER that focuses on digital technologies is INNOVATE. In addition, the BIG DATA ASSOCIATION was established in 2018, thanks to regional funding. The Big Data Association was founded to interconnect the potentials of the new technologies within Big Data, which form the technological pillars of the continuously evolving digital society: High Performance Computing, Big Data Analytics, Deep Learning and Machine Learning Algorithms, Ultra Broadband Networks. The Big Data Association has 15 members, including the Universities of Emilia-Romagna and the research centres of excellence, which account for over 90% of the national supercomputing power and of the Italian public research on Big Data-related topics. Aim of the Association is to promote access to HPC facilities and to share knowledge and results in the field of Big Data and Artificial Intelligence in the economic sector,

in public administration -promoting a more widespread and effective e-government system-, and in the knowledge community, improving their digital capabilities.

- **Open Laboratories** are spaces equipped with advanced technological solutions to start cooperation and collaboration projects involving citizens, the public administration, the third sector, the universities and, in general, all actors that play a significant role in the transformation of the information society in the urban environment. Themes: open innovation, real-life situations, active involvement of end-users, co-creation and user-driven innovation, generation of services, products and social infrastructures.

- **Digital Innovation Hub Emilia-Romagna:** it is brand new in the regional scenario, it is still in the design phase and has submitted an application to be recognized as one of the European Commission's centres in Italy. It will be a widespread place for digital innovation in the sectors that are fundamental for the development of society and the data economy, through the advanced digital technologies identified by the 'Digital Europe' programme i.e. HPC, AI, Cybersecurity, but also through other leading sectors such as the Internet Of Things (IOT). The Digital Innovation Hub will act as the coordinator of a set of territorial services, consultancy and competences made available by the regional innovation and digital ecosystem. This integrated ecosystem will rely on the infrastructure made available at the regional level by Cineca, INFN and Lepida. It will use the skills and the research and experimentation capacity of the laboratories of the High Technology Network and of the regional Universities, and it will include all the networks that are part of the Emilia-Romagna innovation and digital system, involving the local authorities through the Emilia-Romagna Community Network (CN-ER), including the mountain and inland areas.

- **BI-REX** (Big Data Innovation & Research Excellence) is a public-private consortium consisting of 56 members (including the Universities that are present in the Emilia-Romagna region, research centres and companies of excellence) that was established in 2018 in Bologna as a Centre of Competence (CC) within the framework of the Industry 4.0 National Plan, with the mission to support companies in their innovation processes and in the adoption of enabling technologies with a view to Industry 4.0. BI-REX has a participation of ART-ER and pursues its mission by collaborating with trade associations; it is also the only Industry 4.0 CC, which at national level focuses specifically on the Big-Data enabling technology.

By the same token, in order to ensure the constant involvement of the regional public administration, both as a service provider and as an innovation actor, DVBC identifies the following as key players in the **digital transformation of the PA**:

- **Emilia-Romagna Region** through its structures dedicated to Digital Transformation, such as the Competence Centre for Digital Transformation, which supports the Head of Digital Transformation (RTD).

- **Community Network of Emilia-Romagna (CN-ER):** it is composed of the local authorities of the region and represents the framework within which to implement the objectives set forth in the Emilia-Romagna Digital Agenda and in the Local Digital Agendas, as well as to implement, put into operation and manage - through system policies - services and tools aimed at the development of the Digital Administration and of the Emilia-Romagna information society. Among the main aims of the CN-ER are: to pursue the digital innovation process for the overall growth of the Emilia-Romagna territory by sharing policies and strategies; to expand the real and effective use of services by users, as well as to ensure the transparency of processes and managed information vis-à-vis the community; to foster and support the processes of institutional and organizational innovation through ICT in a cooperative, supportive and subsidiary manner, with particular reference to initiatives aimed at encouraging digital transformation and the adoption of agile working methods; to implement and manage in a shared, coordinated, integrated and harmonized manner the process of technological and social innovation within the regional territory; to co-design, implement interventions and deliver services in an integrated manner, implementing economies of scale, in particular through the implementation of a single access system for all services to citizens and enterprises; to promote the design and use of sustainable models of innovation, also from an IT-legal point of view; to rationalize and make all the existing ICT infrastructures and services more efficient while at the same time reducing the spending thanks to actions undertaken by all CN-ER Bodies; to promote actions for the full implementation of the European and national reference regulations on the protection of personal data; to foster actions aimed at developing IT security and cybersecurity policies.

- **Thematic Communities,** a strategic action of the Emilia-Romagna Digital Agenda, were set up with the aim of fostering the development of a digital administration throughout the region, relying above all on the contribution of its professionals. As a matter of fact, the process relies on the collaboration of more than 1,000 employees of the territorial PAs with the aim of helping those who, due to lack of resources, limited size or other reasons, struggle to keep up. A true competence-based community system in which participants bring problems to light and propose solutions, contributing first-hand with their competence and commitment.

- **LepidaScpA** was set up to build and manage the Lepida network, the ultra- wideband network that connects (mainly with optical fibre) all the local authorities in the region, the schools and the world of public health. Over the years, the Lepida network was joined by EmiliaRomagnaWiFi, the free wifi network that covers the entire regional territory and, recently, the IOT network for the PA, which aims at networking public and private sensor systems, is expanding and will be a source of important data for DVBC. In addition to being an infrastructure company, LepidaScpA plays a central role in the design and implementation of digital proximity services for people: from the Public Digital Identity System to the Electronic Health Record, from payment services

to COVID-19 emergency management services, from the Web appointment booking system management to digital justice services and telemonitoring for frail people and their caregivers. In addition to this, the company supports the digital plans of the region in terms of design, research, development, testing and management of ICT services and products for the CN-ER entities. Lepida ScpA also manages the regional DataCenter system where more than 10 Petabytes of regional local authorities data are stored to date. It is therefore the reference point for the regional PA on digital innovation issues and plays an important role in the constant updating of public employees through the management of Thematic Communities.

As a regional policy, the Data Valley Bene Comune (Common Good) will clearly need an appropriate governance structure that will have the dual purpose of monitoring appropriate implementation and promoting integration among actions developed in other sectors and at different levels:

- **Inter-departmental Coordination for Digital Innovation** - In view of the inherent cross-cutting nature of the digital potential involved in the different 'components' of the development policies and the need to exploit this potential in every possible field of application in a coordinated manner, it is first of all necessary to strengthen the coordination between regional digital innovation departments, through the establishment of a system of Interdepartmental Coordination for Digital Innovation, which – alongside the Digital Agenda Coordination system -, promotes an administrative streamlining process inside the Regional and local governments through a 'gentle digital revolution'.

- **The Digital Agenda Scientific Committee,** set up by Regional Law 11/2004, represents the link with the academic world and scientific research, and has the task of supporting the regional government in the preparation and implementation of the Digital Agenda strategy.

- **The "digitalization" controlling body,** established by Regional Council Resolution No. 2226/2016, is an entity that supports the Steering Committee in defining the innovation and digital transition strategy and in continuous monitoring, ensuring the necessary strategic alignment with other existing and related cross-cutting initiatives.

- **The Emilia-Romagna Digital Agenda** represents a coordination function set up within the Cabinet of the President of the Regional Government that aims at overseeing the implementation of the Emilia-Romagna Digital Agenda policy (as per Regional Law 11/2004) and keeping relations with the national, interregional and European levels on a permanent basis and in a logic of concentric circles that progressively widens the scope and relations especially with the regional territory.

The following regulatory instruments (Regional Laws) as well as Planning and Programming elements are fundamental tools for the timely implementation of the strategy:

- **Guidelines for the Digital Transformation of the Emilia-Romagna Region,** which give form and substance to the digital transformation objectives going beyond what has already been done so far with the digitalization of processes and services, the creation and dissemination of a digitalized work space and remote working, digital skills for public administration operators, the rrationalization and standardization of technologies, infrastructures and data. The guidelines outline a path of transformation that goes beyond the Regional boundaries and aims to produce positive impacts on the social and economic contexts of the regional territory, trying to turn the public administration into a forerunner, an experimenter and a driver of an innovation that must become pervasive.

- **Three-year ICT plan of the Emilia-Romagna health care system** – This is an essential tool for the planning, monitoring and verification of the on-going macro-activities in the health care sector, where ICT represents a continuous renewal process. The need for care, the management of acute episodes, chronic conditions, the multidisciplinary approach, the overall progressive ageing of the population and, last but not least, the COVID-19 pandemic and the resulting economic crisis are factors that have particularly affected the Eurozone countries requiring an ever more pressing rationalization in the use of available resources, especially in the health care sector. As a response to this, on the one hand one needs to identify areas and methods to reduce or contain spending and, on the other, define new organizational and technological models aimed at improving care processes. The three-year ICT plan focuses on the latter objective, integrating its actions with the Digital Agenda strategy and with the Digital Transformation Plan of the Emilia-Romagna Region.

The definition of a Regional Law for the recognition of fundamental digital rights is included among the programme objectives. One of the primary goals in the full implementation of the Data Valley Bene Comune (Common Good) strategy is the definition of a digital citizenship law that establishes and protects the digital rights of the citizens of Emilia-Romagna, outlining what the regional 'digitally-augmented' society will have to be like in compliance with the fundamental ethical principles. Furthermore, useful indications will be provided to seize the opportunities offered by technologies and guarantee the competitiveness of our socio- economic system. This law will go hand in hand with Regional Law 11/2004 for the development of the Information Society, which defines the overall aims that have guided the Digital Agenda policies for the last 15 years, identifying infrastructures as a strategic regional asset and recognising how fundamental it is for society to develop a widespread culture and full awareness of the opportunities and risks associated with digital technologies.

On the European front:

- **The Region has approved the document EMILIA-ROMAGNA 2021-2027: GROWING TOGETHER IN EUROPE,** which contains the common regional strategic indications for the negotiations on the 2021-27 programming of European development policies where ample space is given to digitalization. Moreover, in line with what has been defined in the framework of the 2014-2020 Structural Funds programming, the Region's 2021-2027 Smart Specialization Strategy will place digitalization at the heart of the regional specializations because, as already emphasized in the 2014- 2020 S3, "...information and communication technologies are crucial protagonists of the regional development strategy, due to their pervasive impact in the pathways of structural change for the entire production system. This contribution comes both from the enterprises falling within this sector and from the world of research engaged in the relevant information and digital technologies'. Initiatives integrating digitalization and regional sector strategies were already present in the previous S3.

The integration of the innovation ecosystem with the digital ecosystem, the digital transformation of the public administration, the Digital Agenda governance, consistency with the European policies and planning and regulatory instruments makes it possible to implement the objectives of Data Valley Bene Comune (Common Good) and to obtain the related outcomes.

# Challenges

The implementation of the Data Valley Bene Comune (Common Good) strategy to generate the impact envisaged in the Regional Government Programme, involves the definition of 'challenges' associated to change in the entire territory.

These challenges are related to a series of sustainable development goals included in the 2030 Agenda for Sustainable Development, as shown by the icons below.


## 1. COLLECTIVE INTELLIGENCE DATA AVAILABLE TO THE TERRITORY

**Data are at the heart of the positive change that technologies can bring about in every area of society and the economy**. The aim is to define a **regional Data Strategy** in line with the European one, for which our Region intends to be a pioneer. The strategy is presented as a **common cross-sectoral framework of rules, specifications, procedures for access to data and their use which applies to the entire regional system**. It is developed considering all possible producers and users of data (both public and private), it enables the flow of data - starting with the most widely available - and a broader level of data use, guaranteeing high levels of privacy, security, protection and compatibility with standards.

Objectives of the strategy: **the first relates to services**, i.e. promoting a greater use of data for the production of services that are more precisely tailored to users, more flexible and adapted to the specific environment.

The second one is aimed at fostering the **development of systems that support informed decisions based on the processing and analysis of data** and that make it possible to interpret their meanings and information, also in order to make the local areas 'smarter'. The objectives will be achieved also through the widespread availability of advanced **analysis tools and artificial intelligence**. It will be essential to guarantee the utmost attention to the **ethical aspects** of these tools. All this will always take into account clear final (impact) objectives of the use of data.

## FIRST ACTIONS

- → Definition of a regional data strategy: cross-sectoral framework of rules and specifications for data access and use (e.g. privacy policy, legal notes, user licences), always proceeding in relation to specific cases (information assets) of application and ensuring homogeneity and integrability of data;

- → Provision of priority information assets related to mobility and transport, environmental monitoring, health care, social and cultural areas;

- → Development of a decision-support system, based on data processing and analysis, at the 'service' of regional and local government, enterprises (especially SMEs) and the service system (e.g. tourism and the trade fair system);

- → Execution of a feasibility study that, starting from the objective of citizen empowerment, examines in depth national and international models and experiences in which the value of the data made available is recognized to the user so as to make data easily and largely available.


## 2. DIGITAL SKILLS: THE NEW INFRASTRUCTURE FOR SOCIO-ECONOMIC DEVELOPMENT

The dissemination of digital skills in every context is necessary if we are to move from an era in which digitalization is an option to one in which it is the backbone of the production, social, cultural and environmental systems. The main goal is the dissemination of digital skills, responsibility and awareness in all age groups of the population with a specific focus on the gender gap. This goal is to be pursued and implemented with the active involvement of public and private entities -schools, vocational training institutes, libraries, Open Laboratories, players from the regional innovation ecosystem, associations, foundations, network of youth gathering spaces- for a synergistic and scalable action throughout the regional territory.

At the same time, it is equally important to support **training actions on specific digital skills for business development and workers' retraining,** and to promote, together with the world of business and trade associations, actions to support the regional training and education system in training **professionals with advanced digital skills**, also in relation to the exploitation, **management and use of data.** The dissemination of **digital skills** will also have to involve the **public administration personnel.** Specific actions targeted towards the elderly population will also be necessary so that they can also benefit from the services offered by technology.

### FIRST ACTIONS

- **Creation of a digital skills certification standard based on Open Badges -also drawing on previous initiatives- to develop the digital competence of citizens, students, workers. The standard will be consistent with the European DigComp framework;**
- **Enhancement and implementation of open platforms for digital skills development (MOOCs, webinars and self-learning materials) diversified by user category: citizens, vocational training participants, students. The platforms will be enabled to certify the achievements through the release of Open Badges;**
- **Facilitating the development of computational thinking from primary school onwards and in all school cycles with coding courses delivered on open platforms;**
- **Increasing digital intensity in Higher Technical Institutes (ITS and IFTS) by introducing both specific digital transformation courses and digital specifications in any type of course;**

- → Increasing digital intensity in university courses by introducing training on digital applications and their potentials in any type of course;

- → Promoting training courses on Artificial Intelligence in coordination with "Artificial Intelligence Emilia-Romagna", the task force composed of representatives from regional universities;

- → Inclusion in post-diploma training courses (within Higher Technical Institutes) and in university courses (in cooperation with universities) also courses for data enhancement, management and use;

- → Promoting guidance pathways towards STEAM fields and digital subjects in schools and informal learning contexts;

- → Offering highly-skilled young people - Polytechnic Network students, university students and PhD students, particularly from the humanities and socio- economic areas - the opportunity to improve their advanced digital skills through challenge-based approaches, in collaboration with enterprises;

- → Promoting digital skills training initiatives for the weaker segments of the regional population and for caregivers;

- → Promoting initiatives, carried out by public as well as private entities (e.g. pharmacies), aimed at training and informing citizens on the use of online services of public interest, with particular reference to digital identity (SPID), digital payments (PAGOPA), the Electronic Health Record and online public services (APP IO);

- → Promoting initiatives to increase digital skills among young people aged 14-29 who are involved in youth-targeted projects (youngERcard, active citizenship projects, Regional Law 14/08, etc.), youth operators and youth workers belonging to the network of youth services/youth gathering places. Open Badges will be assigned according to the standard digital skills certification system adopted at regional level;

- → Setting up a territorial support network for the dissemination of digital skills among young people as a way to support and assist them in the use of technologies (informagiovani services);

- → Focusing the national civil service programme on intergenerational exchange projects for teaching digital skills to people mostly affected by digital divide (the elderly, etc.);

- → Promoting targeted actions to improve digital skills in the economic sectors lagging furthest behind in terms of IT development (e.g. the agricultural sector).

## 3. DIGITAL TRANSFORMATION IN THE PUBLIC ADMINISTRATION

The technologies that enhance the value of data, that enable more flexible services and a more dynamic relationship between the various Public Administrations and between the PAs and their users, must also be favourably exploited in the organization of work in the public administrations, in the Emilia-Romagna Region and in the entire CN-ER. In the next three years, through the **definition of the Guidelines for the digital transformation**, it will become decisive to strengthen the on-going approach to substantially change administrative processes, work models, the organizational culture and the very nature of many services that will transition to a totally digital mode, with a view to **simplification** as the main goal.

Increasing and strengthening the focus on **working from home**, an intuition that proved to be strategic during the pandemic. In line with the process of defining the regional Data Strategy, we will then proceed with the definition of **governance for the use of data**, which will be instrumental to improving the services provided by the PA and making internal procedures more efficient. The issues **of cybersecurity, algorithm ethics and privacy protection** remind us of the implications of managing data centrally and of digital operations. The **transformation must take place in the entire Public Administration of our territory**, which is why the Region promotes and supports the process of rationalization and strengthening of the Local Authorities within the regional area focusing on the need for digital transformation also in the Unions of Municipalities.

The Emilia-Romagna Region started some time ago to experiment the effectiveness of **digital participation** for the involvement of citizens and stakeholders in the public decision-making process; new tools are needed as well as enabling platforms that allow an open but at the same time safe and honest dialogue between the public administration and the citizens, fostering discussions based on **concrete, verified and open data** (accountability and transparency).

## FIRST ACTIONS

- → Development of the regional dataset catalogue and governance for the use of data consistent with the regional Data Strategy;
- → Definition of regional guidelines for data management (interoperability, integration, use of standards, etc.) in the context of calls for tender;
- → Digital transformation of document management (also through 'augmented intelligence' applications) to produce automatic suggestions useful for the classification and routing of incoming documentation;
- → Implementation of an automated system for answering citizens' queries (URP Chatbot), a platform for standardizing, classifying and simplifying response services to citizens and internal users, standardizing the relationship with the users and significantly reducing the use of e-mail and telephone;
- → Definition of a Simplification Pact and identification of the first areas (16 procedures) which will undergo digital transformation;
- → Launching actions to raise awareness and promote training in digital culture among the public administration staff by promoting inclusion in the CN-ER Thematic Communities of and the collection, exchange and re-use of experiences and skills that are already present in the PAs;
- → Defining in a common way the function and role of the 'Data Manager' within the Emilia-Romagna public administrations;
- → Support action for organizational and technological innovation in the judicial offices in the region;
- → Creation of an open data portal, targeted towards citizens, to disseminate all up-to- date information on the implementation of the territorial security and civil protection works funded during the Government's mandate and their progress, municipality by municipality and province by province.

## 4. DIGITAL TRANSFORMATION IN THE PRODUCTION AND SERVICE SECTORS

Digital technologies are transforming production and service sectors (manufacturing, tourism, trade, agriculture, culture, third sector, etc.): they enable new business models, increase productivity and support the transition to sustainability. With a view to the revitalization of the region and to make the regional economy compete on a European and global level, data represent a primary strategic asset.

The DVBC aims to **support the change of the regional production and service system** by helping to **accelerate the ongoing process of digital transformation of enterprises**, with models that promote digitalization, the generation, collection and processing of data (including big data), access to HPC (high performance computing) and the potential use of Artificial Intelligence, support for the digital transformation of enterprises and for the adoption of 4.0 infrastructures in the processes of transformation and delivery of goods and services, as well as agile organizational approaches. For this reason, the data ecosystem, the renewal and development opportunities, the skills and services of the **Data Valley will** have to be **designed also for the manufacturing and service sectors** so that they benefit from this extraordinary competitive edge and development potential.

The technological specialization model of businesses in Emilia-Romagna lacks many of the emerging technological drivers linked to the digital world and Industry 4.0. Therefore, the companies are not prepared to face unprecedented scenarios in the medium and short term. This is particularly true on the SME side. This is why the **DVBC will have to fit within the Industry 4.0 scenario and its evolutions**, where coordinated and integrated management of enabling technologies, development of information systems and an additional input of specialized skills can bring benefits in terms of productivity, competitiveness and quality for the regional system as well as better wage conditions and work-life balance. A data-based social and economic system will have to foster data sharing dynamics between PA, businesses and the third sector (generation, processing, access and re-use) in a logic of reciprocity.

## FIRST ACTIONS

- → Promoting targeted and coordinated knowledge about digital opportunities in the region's private sector, also with a view to attracting and retaining talent;
- → Supporting the participation of Emilia-Romagna companies in the European project 'Digital Opportunity Traineeships', the initiative promoted by the European Union to develop digital skills through transnational traineeships;
- → Promoting digital procurement throughout the region, particularly for procedures involving the acquisition of innovative goods or services;
- → Promoting the digital servitisation of products, particularly in manufacturing;
- → Fostering a "platform economy" approach for all companies that will create APIs on their services and/or assets, fostering interconnection and open innovation;
- → Facilitating data sharing between public and private entities so as to enable certified traceability of products in the made-in-Italy supply chains.

## 5. USER-CENTRED, INTEGRATED, AUGMENTED, SIMPLE AND SECURE DIGITAL PUBLIC SERVICES

The past programming experience has left us with a legacy of a still limited percentage of users of online services and a level of quality and usability of PA online public services that needs to be improved, also as a result of PA digital transformation practices.

The services to be developed during the current programming period should be designed and built according to three guiding principles right from the outset: (1) **digital & mobile first logic** with a **user-centred approach** to be more efficient and easier to use, resulting in an increased number of users; (2) **flexible and responsive processes** towards changes in society to ensure that services are always adapted to the needs of citizens and businesses and that they make the best use of current and future technological innovations; (3) **collaborative culture**, transparent processes, open and consolidated tools and the use of cloud architectures to support continuous transformation. In order for these principles to be put to real use in the activities of the CN-ER, the creation and development of a regional design-community is proposed with the aim of raising the level of competence on service design and implementation throughout the region.

One of the actions of the Community will be the launch of targeted continuous improvement cycles for strategic services. The result of this Community's work will be regional augmented services integrated with national platforms and consistent with the European directives and capable to proactively propose the most useful, simple and secure options and solutions, guaranteeing data security and user privacy. We will prioritize intervention in specific areas, such as health care, mobility (local public transportation services, etc.), digital humanities (libraries, museums, cinemas, music, etc.).

## FIRST ACTIONS

- A number of existing strategic services have been identified, for which continuous improvement cycles will be initiated that, through a sequence of 'do - measure - improve' steps, will quickly enable the desired level of user experience quality and will continue to improve over time;
- Definition of parameters for assessing the user's central role in the design and implementation of online services;
- Drawing on the experience of improvement projects and within the framework of the European H2020 project UserCentresCities, a pathway will be initiated to build a regional design community, starting with the definition of Guidelines for user-centred digital public services, with precise constraints for CN-ER members;
- Experimentation and development of innovative services for integrated in-person and online use, also including augmented reality technologies and integration with existing services, e.g. for health and social services or trade shows;
- Implementation of televisit, telemonitoring and teleconsultation functions in the regional telemedicine platform;
- Development of an Electronic Health Record chatbot for answering citizens' questions;
- A digital library for the schools of Emilia-Romagna: digital content of all kinds for the schools of the Emilia-Romagna region.

## 6. MORE NETWORKS AND MORE NETWORKING FOR A HYPER-CONNECTED EMILIA-ROMAGNA

A necessary pre-requisite for a hyper-connected region is **the completion and further development of an enabling technology infrastructure** that allows all citizens, businesses and public administrations to have ultra broadband connectivity and access to computing and storage capacity.

This involves, on the one hand, **completing the ultra broadband infrastructure work**, with a specific focus on infrastructure for Internet access throughout the territory (mountain, rural and peri-urban areas) for the connection of schools, town halls, the network of youth gathering spaces/services, but also of production settlements.

The **EmiliaRomagnaWiFi network is** also to be strengthened, with a specific focus on the Romagna coast and in the sports areas of all the municipalities in Emilia-Romagna. On the other hand, if optical fibre and wifi have been the challenges of previous programming efforts, it is now also a matter of looking at new solutions such as 5G and **Internet of Things** networks to increase the pervasiveness, efficiency and resilience of telecommunication, **data collection and transmission** infrastructures **in a fully smart territory**. Emilia-Romagna wants to be a hyper-connected region; for this it will be necessary to support the demand and stimulate the supply of services so that they become available and are adopted.

## FIRST ACTIONS

- → 1Gbps fibre optic connection and bandwidth expansion based on the educational needs of all schools and accredited institutions implementing vocational training courses and the Higher Technical Institutes Foundations;
- → Completing the regional optical fibre cabling plan for productive areas;
- → Completing the National Ultra Broadband Plan in the so-called market failure areas - white areas - giving priority to mountain territories;
- → Providing citizens and businesses with demand incentives (vouchers, subsidies or grants), support and initiatives for widespread community connectivity;
- → Setting up a Connectivity Observatory to make information available to institutions and citizens on the actual availability of connectivity in the regional territory.The Observatory will provide updated information on the status of approval/advancement of infrastructure projects;
- → Completing EmiliaRomagnaWifi coverage along the entire Adriatic coastline;
- → Extending coverage with EmiliaRomagnaWifi to the major sports facilities in the region;
- → Identifying synergies between optical fibre laying and civil works -either planned or under construction at regional level-, making the installation of infrastructural conduits for fibre optic telecommunications (e.g. on cycle paths, etc.);
- → Supporting the creation of " experimentation'islands " of 5G infrastructure and utilisation in specific areas such as port logistics and management and mobility;
- → Extension of the PA's public IoT infrastructure (networks and data platform) for the collection and transmission of public and private sensor data, also in support of territorial governance;
- → Establishment of a regional technical working group on 5G and definition of recommendations or guidelines for the management of 5G technology at territorial level;
- → IoT for real time integrated management of the emergency services infrastructure.

## 7. FROM MARGINAL CONTEXTS TO DIGITAL COMMUNITIES

We believe that giving value to the strategy outlined so far means implementing it as soon as possible, starting from the most marginal areas including the Mountain Areas, the Inland Areas of the region (Inland Areas National Strategy - SNAI), the areas of the crater of the most recent earthquake, but also remote villages and isolated neighbourhoods of large cities, where digital technology can really make a difference. Implementing it means testing it, but above all leaving the 'technological ideology' level to go into the concrete aspects of real life.

We propose the creation of **100% digital communities**, i.e. communities where citizens, businesses, and public administration are able to use technology to qualitatively transform their local reality, making it more pleasant, easier, cheaper, or more profitable to live in: meeting points between digitalization and sustainable development, areas where the Pact for Work and Climate is implemented, more attractive territories, which thanks to digitalization offer slow tourism and ancient heritage.

These are the areas of intervention where to identify enabling solutions such as connectivity. Equally important will be to plan for widespread digital competence (for young people, but also for workers and adults in general), to introduce technologies in the local economy, to organize work providing for remote work and to identify and promote the use of co-working and distance learning (co-schooling) places, so as to encourage people to remain in those areas.

## FIRST ACTIONS

- → Creation of 100% Digital Communities through a co-design process with local actors, giving priority to Mountain and Inland Areas;
- → Setting up of coworking spaces to revitalize urban centres;
- → Implementation of public and private IOT networks to control the territory and provide security to the most frail subjects, with the contribution of citizens and local associations;
- → Adoption of digital solutions within the projects contained in the Framework Agreements of the Inland Areas Strategy in the planned areas of intervention (mobility, school, personal services);
- → Supporting for the use of digital tools in the design of actions to promote and enhance the cultural and natural heritage of the Mountain and Inland Areas as a driver for the development of tourism in these areas;
- → Creation of digital learning communities by strengthening the local collaboration networks between businesses, schools, associations and Public Administration.
- → Adoption of digital solutions through simple tools which make it possible to find the solutions already available within the CN-ER system, to try them in test environments, to obtain a clear description of the underlying process in order to assess its organizational impact, to estimate the costs of deployment and full operation, with particular reference to community welfare solutions;
- → Supporting Mountain and Inland Areas (Inland Areas National Strategy - SNAI) so that young people have the same opportunities to learning digital skills in school and out-of-school settings;
- → Designing a strategy to relocate creative and cultural initiatives as well as digital and innovative activities to peripheral areas.

## 8. WOMEN AND DIGITALIZATION: AN INDISPENSABLE RESOURCE

Gender inequality is still one of the most widespread and invisible inequalities in our everyday context, often taken for granted as if it was 'normal'. This disparity is also true in the technology world. At a global level, only 28% of researchers are women, and this figure is even lower in the field of science. In Italy, according to the report titled The Gender Gap in STEAM fields (Osservatorio Talents Venture, 2019), only 17.71% of women enrolled at university attend a STEAM course, a figure that drops to 17.3% in Emilia- Romagna. Gender stereotypes that are still widespread lead girls and their families to think that science and digital technology are 'male stuff', horizons that are out of their reach. This culture then has repercussions in the world of work: in the start-up and digital worlds, the presence of women is still very limited, and the same applies to the public sectors that are more focused on innovation.

The challenge launched by DVBC is that of changing course, first and foremost in the educational and training spheres, putting the issue of gender equality at the heart of all initiatives as an indicator that makes the role of women and their active presence visible in the Data Valley: a right among rights.

## FIRST ACTIONS

- → Setting up a standing committee of women representing the world of research, work, education and training who, with the help of gender issue experts, propose projects, cooperate and supervise the implementation of the actions envisaged in the DVBC and the annual operational programmes with a view to promoting gender equality;

- → Including gender equality as a pre-requisite for joining DVBC-promoted initiatives and incentives;

- → Implementing synergies and collaborations with all local educational agencies to share and implement a plan to combat the gender gap in STEAM fields and digitalization;

- → Supporting research and development projects based on Big data and AI applications to promote services and tools to facilitate gender equality in professional career pathways, in public services, in training and education;

- → Adopting special attention with reference to the biased use of gender data and related AI applications, starting with equal participation of both genders in the production of research and algorithms. Starting collaboration with the AI4EU[1] European project;

- → Defining the projects of the Digital Transformation Plan from a gender equality perspective with a specific focus on facilitating the reconciliation of life and work for women and for everyone;

- → Involving universities in a joint action to promote STEAM and digital subjects among girls by borrowing good practices already in place and promoting actions for gender equality in university careers;

- → Promoting strong cultural action against stereotypes in the STEAM and digital sphere and also in the school guidance initiatives with the involvement of teachers, educators and families;

- → Promoting and strengthening networks of public and private stakeholders in the region aimed at implementing equal opportunities actions in the field of innovation and digitalization also through a regional award system;

- → Promoting specific guidance initiative for girls concerning STEAM and digital subjects and organizing vocational courses on the new digital professions addressing, in particular, NEET and unemployed women.

1. https://www.ai4eu.eu/

# Results

The table below lists the indicators that most characterize the DVBC strategy and measure its success or failure. One or more indicators are associated to each challenge, for which the state of the art, the 2024 target, the estimated requirements and financial resources to reach the target are provided.

| Description | Baseline/Target | Available/ needed resources |
|---|---|---|
| Reducing the Digital Divide - Connectivity demand incentives for households and businesses in mountain municipalities (vouchers) | 40,000 households out of 212,000 (i.e. 19% of the total)<br><br>9,000 out of 43,500 (i.e. 21% of the total) | 24M€/24M€ |
| Digital skills certification for all population groups (students, workers, elderly people, etc.) - creation a standardized evaluation, certification and acknowledgement system through OPEN BADGES | 100,000 open badges distributed to certify digital skills | 0M€/5M€ |
| Training courses on new digital skills for the 6-19 age group (number of users trained) | 100,000 out of 370,000 (i.e. 27% of the population) | 0€/3,5M€ |
| Setting up of a territorial network to support the dissemination of digital skills and to act as a reference point for first help and assistance (number of available reference points / libraries) | 0/200 | 0€/4M€ |
| Hyperconnected Emilia-Romagna - completion of the Ultra Broadband project in white areas | 102/335 municipal white areas connected with services in operation | 120M€/120M€ |
| All primary and secondary schools, high schools, Higher Technical Institutes and Vocational Training Institutes are hyperconnected up to 1 Giga | 2.200 (i.e. 54% of the total) | 24M€/24M€ |
| Free access to the Emilia-Romagna WiFi Network for Coastal Areas (wifi points per km of coastline) | 0/2.5 points per km of coastline | 3M€/10M€ |

| Description | Baseline/Target | Available/ needed resources |
|---|---|---|
| Free access to the Emilia-Romagna WiFi Network for Sports Centres (EmiliaRomagnaWiFi points made available in sports facilities) | 0/1.200 | 0.5M€/4M€ |
| Integrated, augmented, simple and secure online public services (number of citizens with a digital identity) | 1M/3.5M | 0M€/0.5M€ |
| Integrated, augmented, simple and secure online public services (number of citizens using the electronic health record) | 1M/3.5M | 1M€/1M€ |
| Shared spaces for study and work in marginal areas or conditions (active spaces with common rules and shared standards) | 0/18 | 0M€/2M€ |
| Shared regional data strategy for the Emilia-Romagna Community Network (CN-ER) (number of public bodies formally adhering) | 0/250 | 0.2M€/0.2M€ |
| Info-training events aimed at creating positive discrimination of girls in the STEAM and digital fields with school guidance activities (initiatives specific for girls, teachers, and families) | 100 for girls<br>10 for teachers<br>100 for parents | 0/0,5M€ |
| Increase in the digital skills of 14-29 year olds, youth operators and youth workers involved in youth-targeted projects (youngERcard, active citizenship R.L. 14/08, etc.) and creation of territorial support network for the dissemination of digital skills among young people as a way to support and assist them in the use of technologies | 100,000 open badges distributed | 0/1M€ |

‘the [...] transition from a rich linear economy to a rich circular economy can only happen through new technologies and innovation, above all if combined with the digital, i.e. through automated and smart data processing. If used well, the digital technology enables us to design reusable and recyclable products, to optimize the entire production and consumption cycle, and to do more and better with much less’.

**Luciano Floridi**

from the book ‘The Green and the Blue’

# Annexes

## Annex 1

### THE STATE OF THE ART IN EMILIA-ROMAGNA

The DVBC valley develops in an already fertile ground, thanks to two decades of specific regional digital programming.

In the last programming period, the ADER 2015-2019 Digital Agenda followed the red thread of 'digital for...', i.e. not investing in technology as such, but in digitalization as a facilitator of different business models, social innovation, and as a means to improve the quality of life. Some results:

**Digital Agenda for ... citizens**

**Ultra Broadband (BUL) coverage of the territory for the citizenship**

| | | |
|---|---|---|
| Households with more than 30 Mbps | 2015: 41,2% | 2019: 76,2% |
| Households with more than n 100 Mbps | 2015: 1,4% | 2018: 37% |

Fiber-optic connectivity was joined by an important initiative concerning public and free WIFI, whose priority was to give citizens ubiquitous digital access throughout the region. EmiliaRomagnaWiFi was thus introduced, with the initial objective of creating 1 WiFi point for every thousand inhabitants (4,000 points) by the end of the programming period; in 2015 there were 1,000 WiFi points on the regional territory, in 2019 there were 7,891: this equals 1.8 WiFi points for every thousand inhabitants.

**Services:**

**Availability of online services (% of municipalities with online services)**

| | | |
|---|---|---|
| Pre-school enrolment | 2015: 17% | 2018: 25% |
| School canteen registration | 2015: 16% | 2018: 34% |

**Use of online services (% procedures)**

| | | |
|---|---|---|
| Pre-school enrolment | 2015: 56% | 2018: 78% |
| School canteen registration | 2015: 42% | 2018: 73% |

Among the services, the Electronic Health Record deserves special attention, since it is a true 'single system' of regional health services. the EHR allows citizens to access a series of online services (in addition to their own health data and documents).

## EHR

| | | |
|---|---|---|
| Activated EHRs | 2015: 114.685 | 2019: 771.466 |

Another relevant figure: 46,834,931 HER documents consulted by citizens (in 2019 alone, they were 18 million).

The ADER **Digital Strategy** was also instrumental in supporting national projects on the one hand and, on the other, in enabling the regional municipalities to implement such projects within their own scope of action. An example of this is the implementation of a single **Digital Identity** for access to all the online services of the PA. In this process the Emilia-Romagna Region was a pioneer in the dissemination of the single fedERa identity and in the integration of the online services of local authorities so that they could be accessed with this single identity. Subsequently, the region coordinated with the national action for the dissemination of the SPID digital identity and its integration in the online services of the regional Public Administrations.

| | | |
|---|---|---|
| No. of distributed FedERa IDs | 2015 537.435 | 2019 1.420.491 |
| No. of services accessible with fedERa | 2015 155 | 2019 312 |
| No. of SPID IDs distributed by Lepida | 2018 0 | 2019 23.310 |
| No. of services accessible with SPID Lepida IDs | 2016 30 | 2019 229 |

## Digital skills

The **Pane e Internet** (literally "Bread and Internet") project for the development of digital literacy and digital inclusion continued in cooperation with local municipalities, libraries and associations.

| | | |
|---|---|---|
| Citizens who have attended PeI courses | 2015 12.600 | 2019 37.769 |

## Digital Agenda for ... schools

On the **infrastructure** side, a study by AGCOM (Communications Regulatory Authority) shows how already in 2017 the Emilia-Romagna Region was the region with the highest number (in percentage) of schools connected to Ultra Broadband, well above the national average, far outstripping the other regions.

| | | |
|---|---|---|
| No. of schools connected to Ultra Broadband (UBB) | 2015: 392/1.900 | 2019: 1.074/1.900 |
| % connected buildings | to the Lepida UBB network 47.5% (2019) | to the Lepida fibre-optic network 47.3% (2019) |

## Training

With the Memorandum of Understanding between the Emilia-Romagna Region and the Italian Ministry of Education (MIUR) signed on 16 June 2016 in the framework of the "National Digital School Plan", the Emilia- Romagna Region committed itself to the dissemination of digital innovation in all the educational institutions of its territory, even those located in the most peripheral areas of the region. The Region also committed itself to carrying out training actions on issues related to gender stereotypes in the field of digital technologies and the so-called STEAM fields in which girls show little interest, in order to bring them closer to technology and the digital world.

As of 2019, we implemented 130 technology workshops in the Inland Areas, 3 summer camps, involving 10,000 young people, 40 schools and 150 teachers.

## Digital Agenda for ... PA

### Infrastructure

| | | |
|---|---|---|
| Municipalities with UBB connection | 2015: 85% | 2019: 100% |
| Municipalities with fibre-optic connection | 2015: 82% | 2019: 95% |

### Data Centre

The ADER Data Centre and Cloud Infrastructure for PA continued the actions started in the previous programming period, with the aim of concentrating the IT resources of the regional PA within four territorial data centres.

| | | |
|---|---|---|
| Datacentres providing services | 2015: 0 | 2019: 3 |
| Entities using services | 2015: 0 | 2019: 126 |

## Digital Agenda for ... enterprises

**Fibre optic connection of productive areas,** in order to bring Ultra Broadband to those areas where private operators were not expected to arrive.

| | | |
|---|---|---|
| Productive areas with fibre-optic connection | 2015: 14 | 2019: 224 |

## Services

One of ADER's priorities in the area of PA online services is the integration of services into '**single access points**' at regional level. Thus, since the end of 2018, the single access point for business services has been available, integrating SUAP (One-stop Shop for Productive Activities) services with Construction and Environment services in a single online access point: since 2018, 79,896 SUAP files have been managed online with the new platform, representing 54% of the total number of files.

316 (out of 328) municipalities now use the single regional platform.

## Annex 2

# THE REGIONAL GOVERNMENT PROGRAMME FROM A DIGITAL PERSPECTIVE

| Department | Mandate Goal | Action |
|---|---|---|
| Vice-Presidency and Department for the Fight to inequalities and the Ecological Transition | Reduce inequalities and implement new proximity services for people | Building knowledge pathways towards a more conscious use of new technologies; preventing and combating bullying and cyberbullying under the new plan for adolescents |
| Vice-Presidency and Department for the Fight to inequalities and the Ecological Transition | Reduce inequalities and implement new proximity services for people | Contributing to the definition of digital citizenship training paths for foreign nationals within the AMIF projects |
| Department of Economic Development and Green Economy, Employment and Training | Embarking on a new path of growth | Building an extraordinary digital skills plan to ensure digital skills to employed and unemployed people, facilitate the entry of younger people into the world of work, improve the skills of those already in work and facilitate the re-integration in the job market of those who choose to or are forced to seek a new job |
| Department of Economic Development and Green Economy, Employment and Training | Pervasive and widespread digitisation | Completing the regional cabling plan in production areas and supporting the actions and services of the Digital Innovation Hubs, with particular reference to those undertaken by associations to achieve wide dissemination of infrastructures and services for the digitalization of enterprises |
| Department of Health Policies | Citizen- friendly territorial health care | Further developing the Electronic Health Record platform in order to make all the digital documents produced by the Health Authorities for patients who have given their consent available to healthcare professionals |
| Department of Health Policies | Citizen- friendly territorial health care | Completing the process of introducing e-prescriptions |
| Department of Health Policies | Citizen- friendly territorial health care | Increasing the health care services that can be delivered through telemedicine: video calls, remote delivery of specialist services, teleconsultation between professionals, homecare monitoring of patients, teleconsultation, televisiting, telemonitoring |
| Department of Health Policies | A new season of investments in health care | Developing teleassistance, teleconsultation, tracking and all technological solutions aimed at streamlining the relationship between citizens and the Regional Health Care Service and the exchange of information between professionals. Launching of the regional IT platform and enhancement of digital networks for the provision of Telemedicine Services (teleconsultation, televisit and telemonitoring), as well as for e-learning, inclusion activities and remote assistance |
| Department of Health Policies | Pharmaceutical assistance | Supporting rural pharmacies as multi- purpose health centres through telemedicine |
| Department for School, University, Research, Digital Agenda | An inclusive school, with rights, duties, and equal opportunities | Fighting the digital divide between students, schools and territories to enable schools to implement innovative teaching methods, if necessary also at a distance, equipping families with the necessary tools to guarantee all students access to education |

| | | |
|---|---|---|
| Department for School, University, Research, Digital Agenda | An inclusive school, with rights, duties, and equal opportunities | Supervising the implementation of the "Project to counter the digital divide in access to educational and training opportunities" to ensure that it is completed before the resumption of teaching activities |
| Department for School, University, Research, Digital Agenda | An inclusive school, with rights, duties, and equal opportunities | Monitoring the impact of funding and the residual digital divide in order to take any further action in this direction, through the Technical Committee of the "Project to counter the digital divide in access to educational and training opportunities". |
| Department for School, University, Research, Digital Agenda | An inclusive school, with rights, duties, and equal opportunities | Completing the 1Gbps fibre connection of schools, accredited bodies that implement Vocational Training pathways and Higher Education Institutes Foundations |
| Department for School, University, Research, Digital Agenda | An open, innovative, european school | Completing the 1Gbps fibre connection of schools, accredited bodies that implement Vocational Training pathways and Higher Education Institutes Foundations |
| Department for School, University, Research, Digital Agenda | An open, innovative, european school | Supporting integrated actions with the territory and schooling system in order to promote digital citizenship themes, digital culture and awareness by combating cyberbullying phenomena |
| Department for School, University, Research, Digital Agenda | Schools and territory grow together | Implementing new actions to counter gender stereotypes in educational and vocational choices: supporting training, information and guidance to direct more young people, in particular girls, towards quality technical and scientific training and to overcome cultural barriers that prevent girls from choosing their education or career path free of stereotypes |
| Department for School, University, Research, Digital Agenda | Hyper- connected region and the right to access | Setting up a connectivity observatory to collect and make available to institutions and citizens information on the actual availability of connectivity in the region |
| Department for School, University, Research, Digital Agenda | Hyper- connected region and the right to access | Rediscussing the National Broadband Project to accelerate coverage for private citizens and businesses |
| Department for School, University, Research, Digital Agenda | Hyper- connected region and the right to access | Increasing the availability of connectivity technologies for businesses and citizens through the combination of market initiatives and publicly funded interventions, coordination of interventions and complementary technologies |
| Department for School, University, Research, Digital Agenda | Hyper- connected region and the right to access | Promoting the deployment of networks (fibre-optic, FWA, WIFI, 4G and 5G, Internet of Things networks) to increase the pervasiveness, efficiency and resilience of telecommunication infrastructures and data collection and transmission in a fully smart territory |
| Department for School, University, Research, Digital Agenda | Hyper- connected region and the right to access | Providing incentives, facilities, support and initiatives for widespread and community connectivity, aimed at families and businesses in mountain municipalities or in difficult situations (priority given to conditions of economic fragility and territorial marginality) |
| Department for School, University, Research, Digital Agenda | Hyper- connected region and the right to access | Expanding the connectivity offer of EmiliaRomagnaWiFi, the fast free-access WiFi connection on the Romagna coastline and in the sports facilities of all the Emilia-Romagna municipalities, for easy connectivity available to everyone |
| Department for School, University, Research, Digital Agenda | The data region: efficiency and simplification | Strengthening coordination between departments for digital innovation, through the establishment of a system of Interdepartmental Coordination for Digital Innovation, which through a 'gentle digital revolution' promotes administrative streamlining within the regional and local governments |

| | | |
|---|---|---|
| Department for School, University, Research, Digital Agenda | The data region: efficiency and simplification | Promoting a new way of using data as an information asset for authorities, citizens and businesses by defining a regional Data Strategy |
| Department for School, University, Research, Digital Agenda | The data region: efficiency and simplification | Fostering the development of systems that support informed decisions based on data analysis and management as well as systems that make meanings and information understandable also through artificial intelligence tools |
| Department for School, University, Research, Digital Agenda | The data region: efficiency and simplification | Promoting the implementation of digital and mobile-first public services, which are aggregated, augmented, secure, simple, available in all conditions and contexts and based, whenever possible, on cloud architectures and open code |
| Department for School, University, Research, Digital Agenda | The data region: efficiency and simplification | Ensuring data security and the protection of citizens' privacy through compliance with the highest standards of data protection |
| Department for School, University, Research, Digital Agenda | Citizenship and digital competence | Enacting a digital citizenship law that establishes and protects the digital rights of the citizens of Emilia-Romagna, defining what is to be the 'digitally-augmented' regional society, respecting and stating fundamental ethical principles as well as identifying useful guidelines for taking advantage of the opportunities offered by technologies to ensure the competitiveness of our social and economic system |
| Department for School, University, Research, Digital Agenda | Citizenship and digital competence | Promoting actions that strengthen the use of remote working and coworking spaces as a way for people to continue living in mountain areas, and to foster the ecological transition, both through coordination of and access to national and EU funding plans, and through specific regional projects |
| Department for School, University, Research, Digital Agenda | Citizenship and digital competence | Promoting the spread of digital skills and digital awareness among all age groups of the population to support full digital citizenship |
| Department for School, University, Research, Digital Agenda | Citizenship and digital competence | Promoting support and guidance actions, also of an inter-institutional nature, to overcome the gender gap in technology professions |
| Department for School, University, Research, Digital Agenda | Citizenship and digital competence | Supporting training actions on specific digital skills for the development of the industrial ecosystem and the re-skilling of labour |
| Department for School, University, Research, Digital Agenda | Citizenship and digital competence | Promoting actions that support the Region's training and education system in training advanced professionals in digital skills, also in relation to the valorization, management and use of data, as measure supporting the expansion of the Data Valley project |
| Department for the Environment, Soil and Coastal Protection, Civil Protection | A transparent region, close to citizens and useful in emergencies | Activating an open data portal to easily retrieve all up-to-date information on the state of the works funded during the regional government's term of office and their progress, municipality by municipality and province by province |
| Mountain Department, Internal Areas,<br><br>Territorial programming, Equal opportunities | Near apennines. Enhancing the mountain identity and potential | Completion of communication infrastructures throughout the mountain areas. The isolation imposed by COVID-19 highlighted the need to ensure the infrastructure coverage of the Apennines. We will immediately speed up the construction of infrastructure for access to mobile telephony and fibre-optic connection of all school buildings, town halls, and production sites in all mountain areas. At the same time, we will provide incentives for connectivity and the purchase of the necessary information technology to families and businesses through the provision of vouchers. We also intend to promote actions to solve the problems of TV signal reception |

| | | |
|---|---|---|
| Department of Agriculture and Agri-food, Hunting and Fisheries | Generational turnover and development of rural areas | Reducing the territorial digital divide and completing the network infrastructure for full broadband coverage of the rural territory |
| Department of Agriculture and Agri-food, Hunting and Fisheries | Resilience and adaptation to climate change | Strengthening the agro-weather monitoring network, warning systems and forecasting models, exploiting the potential of new technologies and big data |
| Department of Agriculture and Agri-food, Hunting and Fisheries | Knowledge, innovation and simplification | Strengthening the on-going digitalization and dematerialisation processes of agricultural farms, also capitalising on the simplified, agile and online working methods implemented during the COVID-19 emergency (UMA, remote ITC monitoring, digital badges) |
| Department of Agriculture and Agri-food, Hunting and Fisheries | Knowledge, innovation and simplification | Ensuring greater integration and interoperability of agricultural databases and information systems |
| Culture and Landscape Department | Digital humanities | Providing for interventions in favour of the digitalization of the historical, book and archive heritage |
| Culture and Landscape Department | Digital humanities | Providing for interventions and advice to foster the increasing application of digital technologies to the cataloguing, use and communication of museums and cultural heritage |
| Culture and Landscape Department | Digital humanities | Integrating Emilia-Romagna cultural databases into world networks (cultural institutes need to increasingly follow the 'Wiki philosophy', contributing with sophisticated content to shared databases) |
| Culture and Landscape Department | Digital humanities | Providing for digital integration of booking services, access (cards), promotion, quality standards of museums and libraries |
| Culture and Landscape Department | Digital humanities | Contributing to designing libraries in the age of digital libraries |
| Department of Budget, Personnel, Heritage, Institutional Reorganisation | A new pact between citizens, businesses and public administration | Digitalizing access to public administration services and data- driven policy-making processes, implementing 'digital and mobile-first' policies, enabling authorisations, payments and information from everywhere and in as few clicks as possible; standardizing digital tools between different institutional levels as much as possible; making decisions using all available data to the best of their ability |
| Department of Budget, Personnel, Heritage, Institutional Reorganisation | Revitalisation of the civil service | Implementing and disseminating remote working within the PA, in order to achieve the goal of structuring working methods in an innovative way, by objectives and with feedback on the attained results. |
| Department of Budget, Personnel, Heritage, Institutional Reorganisation | Valorisation and organisation of heritage | Completing the investment of the Bologna Technopole to make it a European research hub |
| Presidency of the council | Promoting territorial security | Selecting and supporting effective and quality video surveillance systems, giving priority to projects that include advanced technologies, sustainable resources and management methods, uniform minimum standards of technical and technological components |

## Annex 3

# THE MAIN DIGITAL POLICIES OF THE EUROPEAN UNION AND ITALY

The motivations and priorities underlying the Data Valley Bene Comune (Common Good) strategy are common to those set forth in the main European and national strategies that are currently being defined. We are therefore responding to the common perception that a leap forward is urgently needed. Digitalization is no longer as an add-on, but THE resource to best address the current social, economic and environmental challenges and crises. In this new approach, data are the cornerstone in their entire life cycle: production, storage, processing. These common priorities will allow us not only to have fixed points of reference, but also to propose ourselves as an area in which to devise, test and implement solutions in partnership with other territorial realities, developing them together with the network of innovators of the Emilia-Romagna region with European-level ambitions.

At the beginning of 2020, the **European Union** produced a Digital Strategy that brings together the framework communication 'Shaping Europe's Digital Future', the European Data Strategy and the White Paper on Artificial Intelligence. It is worth summarizing here the central points of these documents, because they will inform legislation and investment over the next five years, and they also guide our programming strategies.

'**Shaping Europe's Digital Future**' highlights all the digital elements that are and will have to be part of the various vertical policies in order to maximize investments and results. It covers initiatives in every sector, from enhancing connectivity to the relationship between citizens and public administrations, with a focus on the need to ensure reliable digital identities for European citizens, from a new industrial strategy that favours the transition to a clean, circular and digital economy for large companies and SMEs, to stringent actions to boost the digital skills of Europeans; on this topic it foresees, among other things, the development of a digital skills agenda aimed at boosting digital skills in the world of work and initiatives targeting young people at the start of their careers. It eemphasizes the need for PAs to tackle digital transformation head on, in order to manage the overall changes in a climate of confidence.

The **EU Data Strategy** poses a challenge to all Member States: to find a European way to balance the flow and wide use of data while maintaining high levels of privacy, security, protection and ethical standards. The goal is to create a single European data space in which both personal and non-personal data, including commercially sensitive data, are secure and businesses have easy access to an almost infinite amount of high quality industrial data that stimulate growth and create value while minimizing our carbon and environmental footprint.

Four areas of intervention have been outlined, which can serve as a 'beacon' for the development of our regional strategy **a cross-sectoral governance framework for data access and use**, including a possible European data law; **investment in data and strengthening European infrastructures and capac-**

**ities for data hosting, processing, use and interoperability**, with the creation of European data spaces and federated cloud infrastructures; **skills**, for individuals (by strengthening the right to portability) and businesses (focus data and big data); **common European data spaces in strategic areas and areas of public interest** with sector-specific legislation for data access and use and mechanisms to ensure interoperability.

**The White Paper on Artificial Intelligence** indicates tools and guidelines to make artificial intelligence accessible to large companies, but also to SMEs and public administration. This again involves investment in **skills, support for start-ups, innovators and companies with high growth potential**, as well as action in the **regulatory sphere** that, on the basis of the ethical guidelines drawn up by the high-level expert group set up by the commission, responds to the new questions posed by AI in the areas of security, liability and the protection of fundamental rights.

On the European front, the **first programme** entirely dedicated to digital technology called **'Digital Europe'** has been launched with targeted investments in strategic digital infrastructure, improving advanced skills and modernizing the interaction between governments and citizens. Focus is on high-performance computing, artificial intelligence, cybersecurity and trust, advanced digital skills, deployment, optimal use of digital capacity and interoperability (for PA and businesses).

With regard to education and training, the European Union, following a public consultation held from June to September 2020, recently updated its **Digital Education Action Plan**: an initiative to make education fit for the digital age. The initiative has two strategic priorities: promoting the development of a high-performance digital education ecosystem and improving digital skills and competences for digital transformation.

Concerning the first priority, the European Commission intends to propose guidelines on e-learning and distance learning for primary and secondary education, encourage broadband connection of schools, support digital transformation plans for education and training, and develop ethical guidelines for artificial intelligence and the use of data in teaching and learning. The second priority includes both initiatives to develop basic digital skills from an early age and projects to increase advanced digital skills in order to create more digital specialists and ensure that girls and young women are given equal opportunities in digital studies and careers.

On the online services and eGovernment front, all ministers of the EU member states signed the **Berlin Declaration** at the beginning of December 2020. The Berlin Declaration restates the principle of user-centricity already set forth in the Tallinn Declaration and recognizes the role of public administrations as a leading and driving force for the digital transformation of the European society. To do so, it establishes seven key principles linked to related policy actions: respect for fundamental rights and democratic values in the digital sphere; social participation and digital inclusion; digital literacy; trust and security in digital interactions with PA; digital sovereignty and interoperability; human-centred services and innovative technologies in the public sector; a resilient and sustainable digital society.

Another international initiative of interest and in line with the DVBC principles is the **Contract for the Web** global action plan. It is an initiative that was set up with the aim of making our online world safe and secure for everyone to use. Contract for the Web states that everyone has a role to play in safeguarding the future of the Web, especially public administrations, businesses and citizens.

**The Contract for the Web defines 9 principles:**

**For public administrations:**

- Ensure everyone can connect to the Internet;
- Keep all of the Internet content available, all of the time;
- Respect and protect people's fundamental online privacy and datarights.

**For companies:**

- Make the Internet affordable and accessible to everyone;
- Respect and protect people's privacy and personal data in order to build online trust;
- Develop technologies that support the best in humanity.

**For citizens:**

- Being creators and collaborators on the Web;
- Building strong communities that respect civil discourse and human dignity;
- Fight for the Web.

In **Italy,** meanwhile, programmes and regulations have been produced that are fully consistent with the EU approach and the DVBC, with key words such as skills, data, artificial intelligence, digital transformation.

**Digital Republic** arises from the awareness that Italy is significantly penalized in digital growth by a lack of **digital skills** in the population and its productive component. **Digital Republic** is promoted by the Department for Digital Transformation of the Presidency of the Council of Ministers with the aim of combating the digital divide with two specific actions: **reducing the phenomenon of digital illiteracy** to levels at least similar to those found in European countries of reference and **significantly increasing the percentage of ICT specialists** who are expert in emerging technologies to the levels of many other European countries.

Strategy for Italy's technological innovation and digitalization by 2025

This strategy, developed by the Ministry for Technological Innovation and Digitalization (MID), relies on the assumption that innovation and digitalization must be part of a structural reform of the state to promote more democracy, equality, ethics, justice and inclusion and generate sustainable growth that respects human beings and our planet. The strategy includes three challenges identified from the United Nations Sustainable Development Goals and twenty innovation and digit digitalization actions implemented by the MID in consultation with other ministries, central and local government, public bodies, agencies, private companies and ordinary citizens.

2020-2022 three-year plan for IT deployment in PA

The 2020-2022 three-Year Plan aims to foster the **growth of an increasingly digital society** through the informatization of public administration.

Its core points are as follows: the use of the cloud must always be placed at the centre when defining a new project or developing a service; public data as a common good: to be valued and made available to citizens and businesses, in an open and interoperable form.

Interventions to support the digitalization of businesses in Italy were mainly led by the Ministry of Economic Development. The measures are part of the Ministry's broader Industry 4.0 Plan, introduced in 2017 with a four-year duration. This programme aims at stimulating investment in R&D and the creation of new technologies, focusing mainly on supporting the integration of smart manufacturing practices as a driver of SME growth in the manufacturing sector. The support provided was not limited to the manufacturing sector, and the scope of digitalization encompasses investments in capital goods as well as intangibles and processes, with policies specifically designed to guide and assist SMEs in their pursuit of digitalization. In addition, Digital Innovation Hubs (DIHs) and competence centres have been created to form a network linking businesses with actors that can assist them in the digitalization process.

In August 2019, the Ministry of Economic Development published a **draft of its National AI Strategy**[2] for public consultation that ended in September, producing a document that is now under consideration by the so-called "high-level group". At the same time, the Ministry also published a background document, entitled Proposals for an **Italian AI Strategy**[3], which provides initial guiding principles and policy recommendations as the basis for the Italian AI strategy. The document addresses several topics including AI-related skills at all levels of education, a regulatory and ethical framework to ensure sustainable and reliable AI, developing a data infrastructure, and improving public services through wider adoption and use of AI applications.

Finally, at the regional level, the new Smart Specialisation Strategy (S3) for research and innovation for the period 2021-2027 is being defined. The S3 is a tool used throughout the European Union to improve the effectiveness of research and innovation policies and contribute to the competitive strengthening and growth of regional economic systems. The new Strategy will have to take into account the results of the previous seven-year period, the evolution of technology, the regional ecosystem, but in particular the new global challenges (objectives of the new cohesion policy and Agenda 2030) and the objectives of the Regional Council's Government Programme. It is confirmed that the Region is specialized in 7 production systems (Agrifood, Mechatronics and Motor Engineering, Construction, Health and Wellbeing, Culture and Creativity, Innovation in Services and Green Technologies) and the priorities are defined according to the major challenges: sustainability, digitalization, social inclusion, wellbeing and quality of life, safety, through the identification of priority cross-sectoral thematic areas.

2. https://www.mise.gov.it/images/stories/documenti/Strategia-Nazionale-Intelligenza-Artificiale-Bozza-Consultazione.pdf
3. https://www.mise.gov.it/images/stories/documenti/Proposte-per-una-strategia-italiana-2019.pdf

## Annex 4

# ANALYSIS OF MACRO-ENVIRONMENTAL VARIABLES AND EXTERNAL FACTORS

The definition of the Digital Agenda and the strategic actions envisaged to make our territory a "Data Valley as a Common Good" must take into account the existing scenario and the environment in which it operates. To better understand the current context, a PESTEL Analysis (Analysis of Political, Economic, Social, Technological, Environmental, Legal Factors) will be carried out.

The analysis will be useful to identify and highlight which external factors may influence (negatively or positively) our strategic and operational choices and thus help us to identify possible corrective measures.

The analysis will take into account the macro-environmental variables most relevant to our issues, actions and objectives. In addition, since the analysis is performed in relation to the current situation, it will inevitably be affected by the effects of the pandemic.

### Political factors

The political factors are the ones we have to pay most attention to in our analysis for several reasons. Firstly, the Digital Agenda is a political act; moreover, in recent years, different levels of government (from the European Union to local authorities) have implemented digital policies. Among the political factors we can therefore list the following:

- Regional political situation: the regional elections in Emilia-Romagna took place on 26 January 2020. The fact that the next elections will be far off in time and the high number of councillors belonging to the majority group should guarantee the necessary time and stability to be able to develop the planned policies;
- One of the main regional policy actions in 2020 (which will also affect the following initiatives) is the Pact for Work and Climate, an action plan shared by the region with the economic stakeholders, the trade unions and the trade associations, focusing on work and the environment;
- Italian digital policies: there are several national initiatives concerning digital technology and these are likely to continue regardless of the political events.
- In particular, the 2020-2022 three-Year Plan for IT deployment in PA has recently been updated, the Digital Republic project on ICT skills has started, and a national strategy on artificial intelligence has been adopted;
- Digital policies of the European Union: from 2021, the European Union will have for the first time a programme entirely dedicated to digitalization: Digital Europe. Furthermore, a specific data law is planned in 2021. Finally, the Horizon Europe research and innovation programme is scheduled to start in 2021. In early 2020, the European Union published the European Data Strategy, the White Paper on Artificial Intelligence and the strategy 'Shaping Europe's Digital Future'.

## Economic factors

- Economic situation: The ongoing health crisis has led to a significant downward revision of growth estimates for the Italian economy. The recession will hit harder on the northern regions, but in Emilia-Romagna it will be more contained than in Lombardy, Tuscany, Piedmont and Veneto. At the national level, the change in GDP for the year 2020 will be about -9% while growth of about 6% is expected in 2021. For the Emilia-Romagna Region, the variation forecast for 2020 will be -9.9% with a recovery of +7.1% in 2021 (UnionCamere Emilia-Romagna estimate, 26 November 2020). Exports have also suffered a significant drop already in the first quarter of 2020 (-2.4%);
- Recovery fund: following the crisis caused by COVID-19, substantial resources (both in the form of loans and non-repayable financing) will be allocated to Italy by the European Union;
- European Funds: Horizon Europe, Digital Europe, but also indirectly managed structural funds such as the ERDF will provide funding for dedicated initiatives, innovation, research and digitalization;
- Labour market: because of the use of artificial intelligence, repetitive jobs are increasingly being performed by machines, resulting in a loss of work for those with low skills. At the same time, ICT jobs and, more generally, highly skilled jobs are increasingly in demand.

## Social factors

- COVID-19: the ongoing pandemic has changed many aspects and habits in people's lives. Indeed, work habits have undergone significant changes (increasing remote work), education, leisure, sports, tourism and travel in general;
- The results of the latest DESI (Digital Economy and Society Index)[4] report show that Italy is still lagging behind in the items taken into consideration by the index: connectivity, digital skills, Internet use for online activities, integration of digital technologies and public digital services. In particular, Italy scores well below the European average in the areas of 'digital skills' and 'online activities'. The regional DESI 2020 index shows that Emilia- Romagna is fourth in the ranking among Italian regions;
- Despite the low basic IT skills of the population, technology plays an increasingly important role in the lives of citizens in Italy: Internet and ICT are used in all core activities;
- The Emilia-Romagna region has 4,471,485 inhabitants (about 7% of the Italian population): 23.9% of the population are elderly (over 65), the ICT sector employees are 49,460 on a total of 1,555,283 employees, the region produces 9.1% of Italian GDP (2017 figure), it ranks second in per capita GDP (€35,300 - 2017 figure), it has an employment rate of 69.6% (second best in Italy after the Autonomous Province of Bolzano), and the percentage of young people graduating from university is 23.3% (second after the Autonomous Province of Trento);
- Gender gap in employment at national and regional level: in 2017-2018 in Emilia-Romagna the average female employment rate among people aged from 15 to 64 years was 67%, in line with the EU average and considerably higher than the Italian average (52.5%). Women in Emilia-Romagna account for 44.3% of the employed workforce, but with big differences in the various

4. https://ec.europa.eu/digital-single-market/en/desi

economic sectors and professional roles: they represent 72.9% of the staff employed in the health care, social services and education sector and only 35% in information and communication services. In Emilia-Romagna only 13.5% of entrepreneurs are women, compared to 62.4% of employees;
- Gender gap in university education: during the year 2017/2018, 55% of those enrolled in university in Emilia-Romagna were female, with a rate of transition from high school to university of 56.4% for girls and 46.2% for boys. However, the presence of girls in STEAM courses is still very low: girls account for 22% of those enrolled in engineering faculties, 27% of those enrolled in science faculties and 91% of those enrolled in pedagogical area courses. The percentage of girls graduating in Emilia-Romagna is 25%, which is higher than the national average of 22%.

### Technological factors

- Italy has a strategic Ultrabroad Band plan that aims at developing an ultra-wideband network throughout the country;
- Lepida released 418,410 SPID digital identities in the Emilia-Romagna region;
- Cybersecurity: the Clusit2020 report showed a 7% growth in cyber attacks in 2019 compared to the previous year and even a 91% increase compared to 2014. At the same time, investments by companies (mainly medium-sized ones) to secure a 'trust framework' are on the rise;
- The Bologna Technopole is home to the Big Data Technopole, a high- performance computing (HPC) centre;
- Digital Innovation Hub Emilia-Romagna: it is it is still in the design phase and has submitted an application to be recognized as one of the European Commission's centres in Italy, a centre for digital innovation in key areas of societal development and data economy, through the implementation of advanced digital technologies;
- There are 930 start-ups in the region, the entrepreneurial orientation (active enterprises per 100 inhabitants) is 8.3.

### Environmental factors

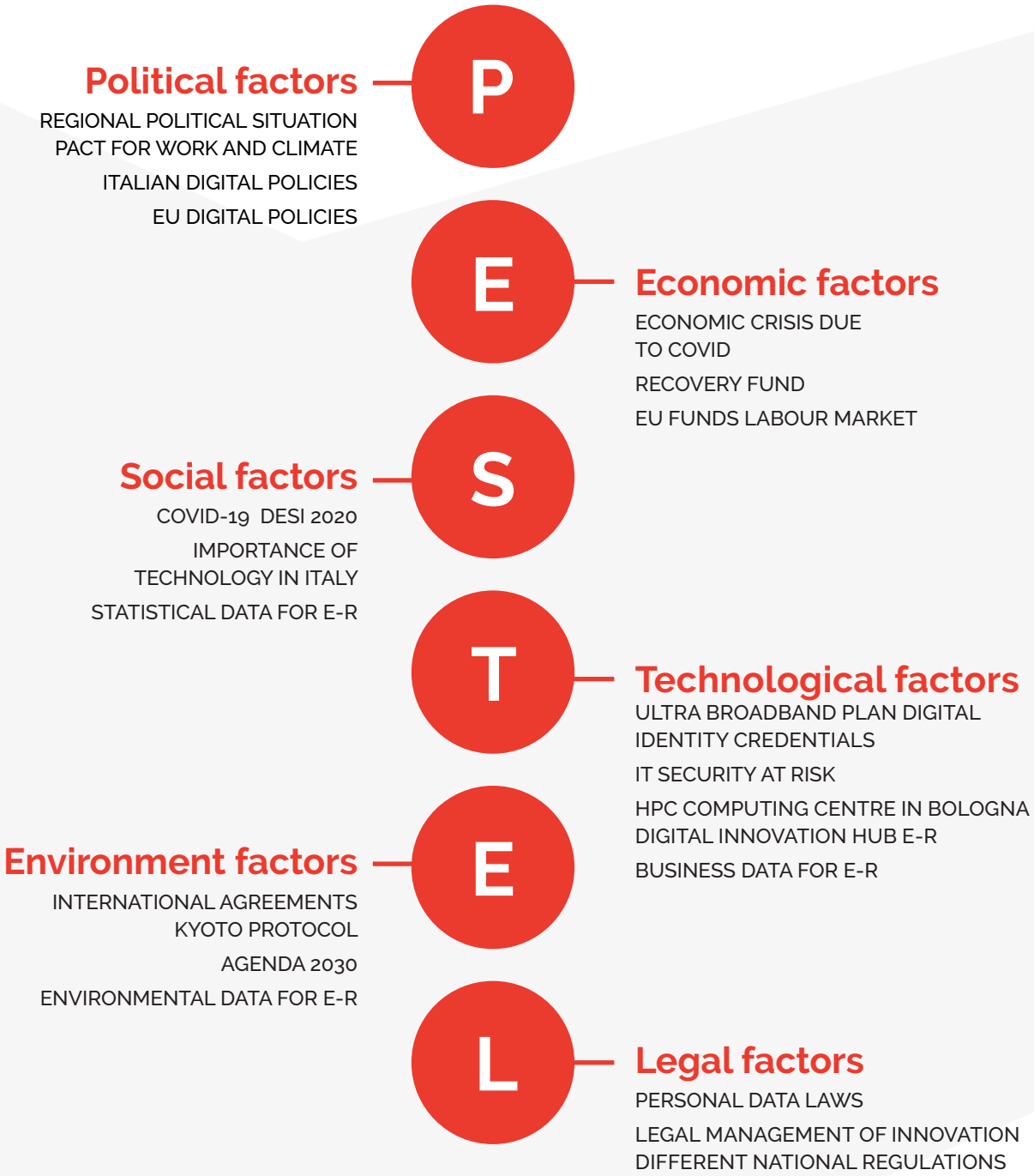
- Environmental factors are increasingly relevant and more and more people are sensitive to this topic. The environment is at the centre of several agreements (Kyoto Protocol extended with the Doha Agreement, Paris Climate Agreement) and important international initiatives (Agenda 2030 for Sustainable Development);
- Pollution data in Emilia-Romagna for 2019:
  - PM10: Annual average 40 µg/m3;PM 2.5: Annual average 25 µg/m3;
  - Nitrogen dioxide (NO2):Annual average 40 µg/m3;
- With almost 80,000 landslides, the Emilia-Romagna region ranks second in Italy after Lombardy.

### Legal factors

- Increasingly stringent laws on personal data;
- Innovation management: While there is a great demand for new technologies (by companies, but not only), there is a lack of or gap in regulations for their management. Some examples: regulations on the use of data (personal but not only), regulations on the use of artificial intelligence, on the use of images, on the management of fake news and, in general, on the responsibility for publishing content online, etc.;

- Differences between the technology regulations of the various states: the European Union is trying to create common regulations to be proposed to all member states (an example: the GDPR - General Data Protection Regulation). There are no international agreements, yet;
- Outcome of the public consultation and revision of the Broadband State Aid Guidelines.[5]

## PESTEL ANALYSIS




5. https://www.fasi.biz/it/notizie/strategie/22508-b

The above macro-environmental variables are thus used to proceed with a partial SWOT analysis: only external factors, i.e. threats and opportunities, will be dealt with. In this way, it is possible to highlight which factors are favourable to our initiative and which are unfavourable, and thus imagine possible countermeasures. It was not possible to determine whether certain factors (listed at the bottom) are favourable or unfavourable.

| Threats | Opportunities |
|---|---|
| Economic situation (Economic Factor) | Regional political situation (Political Factor) |
| Labour Market (Economic Factor) | Pact for Work and Climate (Political Factor) |
| DESI 2020 (Social Factor) | Italian Digital Policies (Political Factor) |
| IT Security (Technological Factor) | EU Digital Policies (Political Factor) |
| International Agreements (Environmental Factor) | Recovery Fund (Economic Factor) |
| Pollution data in E-R (Environmental Factor) | European Funds (Economic Factor) |
| Personal Data Laws (Legal Factor) | COVID-19 (Social Factor) |
| Legal Management of Innovation (Legal Factor) | Importance of technology (Social Factor) |
| Different national regulations (Legal Factor) | Ultra-Broadband Plan (Technological Factor) |
| | HPC in Bologna (Technological Factor) |
| | DIH in Emilia-Romagna (Technological Factor) |

| Neutral Factors |
|---|
| Statistical data for E-R |
| SPID digital identity credentials |
| Business data for E-R |

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