ATTACHMENT 1

DIGIBEST PEER REVIEW REPORT
BASILICATA / ITALY

AUGUSTO FERREIRA, PORTUGAL
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TABLE 1. LIST OF ABBREVIATIONS USED IN THE TEXT.

AF	Application form
AP	Advisory Partner
BDRM	Business Digitalisation Regional Road Maps
DESI	Digital Economy and Society *Index*
CRM	Customer Relationship Management
CV	Curriculum Vitae
EC	European Commission
eIDAS	EU regulation on electronic identification and trust services for electronic transactions in the European Single Market
ERDF	European Regional Development Fund
ESF	European Social Fund
EU	European Union
GP	Good Practice
HP	Hosting partner
ICT	Information and Communication Technologies
IE	Interreg Europe
JS	Joined Secretariat
LP	Leading partner
MC	Management Committee
MoEPRD	Ministry for Environmental Protection and Regional Development
PP	Project partner
PR	Peer Review
PRM Guidelines	Peer Review Methodology Guidelines
PRR	Peer Review Report
RIS3	Regional Innovation and Smart Specialisation Strategy
ROP	Regional Operational Programme
RRP	Recovery and Resilience Plan
RS	Regional Studies
RTD	Research and Technological Development
SH	Stakeholder
SG	Steering Group
SP	Sending partner
SME	Small and medium enterprise
STEM	Science, technology, engineering and mathematics

This PR methodology is using specific terms, such as:

- **PR expert** – the expert hired by the project sending partner;
- **Hosting partner** – the project partner responsible for organizing the PR event;
- **Hosting region or country** – the region or country, where the PR event takes place;
- **Sending partner** – the project partner responsible for hiring and sending the PR expert;
- **PR process** – the whole process starts from hiring PR experts by PPs until conducting the Joint PRR of the DigiBEST project by the AP.
- **PR event** - PR online or onsite visit to the HP's region during which the field research will be done.

1 Introduction

This peer review (PR) exercise consisted of an analysis performed by external experts on the situation of digital transformation of SMEs in the Basilicata region.

The achievement of the following goals under the peer review action was considered crucial to fully address the expectations expressed by DigiBEST Hosting Partner (HP):
- identification of the main challenges, barriers and difficulties in the digital transformation of SMEs and microenterprises in the Basilicata region;
- analysis of the main regional policy instruments for promoting digitalisation and identification of opportunities for improvement;
- analysis of the potential of successful practices implemented in other European regions in the field of digitalisation and consider their transferability to Basilicata;
- advising on concrete digitalisation-related solutions to foster digital transformation in small businesses based in the region;
- recommendations for new policicies and policy tools to overcome existing problems and barriers.

The PR was based on two main sets of activities: desk research, including review of literature, policy documents and a detailed analysys of the regional study put together by Sviluppo Basilicata; as well as field research, which consisted mainly in carrying out online meetings and interviews.

With regard to desk research, the analysis of the report sent by the HP on the Basilicata region assumed a central part of this activity. In particular, topics included in the report on the economic context and business activities, innovation ecosystem and digitalisation supporting policies proved to be of significant importance for a better understanding of the region's situation regarding the challenges posed by digital transformation.

The analysis of two key regional policy documents – ERDF Regional Operational Programme Basilicata 2014-2020[1] and the Regional Innovation and Smart Specialisation Strategy 2014-2020[2] - was very useful to understand the main strategic guidelines and respective public policy instruments for innovation and digitalisation.

Other documents about the region were consulted from the bibliographic list offered by the HP in the submitted report, which proved to be helpful for a better understanding of the Lucanian socio-economic framework and innovation system. Thanks to basic knowledge of the Italian language and the use of automatic translators, the experts were able to work with original versions of the documents.

Field research activities consisted of online meetings organised by the HP on the 14th, 15th and 16th of December 2021. The first two days were mainly dedicated to interviews with local stakeholders, while the last day was reserved for a presentation delivered by the experts on draft conclusions and recommendations, as well as an open debate with all participants who intervened during the previous days.

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[1] http://europa.basilicata.it/fesr/wp-content/uploads/2019/03/Programma-Operativo_FESR-2014-2020-Versione-4.3.pdf
[2] http://europa.basilicata.it/fesr/strategia-innovazione-e-specializzazione-intelligente-s3-basilicata/

Interviews were conducted with the following organisations: ERDF Regional Operational Programme 2014-2020 Managing Authority; Chamber of Commerce of Basilicata; University of Basilicata; Confindustria Basilicata; Basilicata Creativa Cluster; and Energy Cluster. The Automotive Cluster and the Aerospace Cluster were included in the final agenda but did not attend the interviews due to unexpected needs.

A questionnaire was prepared by the experts and previously distributed to the interviewees by the HP. The questionnaire included a set of general questions asked to all stakeholders, as well as specific questions distinguishing four groups of actors: regional operational programme (ERDF authority); university; clusters; and business associations. A simultaneous translation service was provided by the HP during the three days of the event, which allowed for good communication with the participantes who preferred to respond in Italian.

Overall, the interviews were carried out in a very satisfactory way and the interviewees generally responded clearly to the asked questions, having provided very relevant information for the peer review exercise.

2 Presentation of the Peer Review team

The University of Latvia acted as the AP, being responsible for ensuring that DigiBEST methodology was followed and implemented during the PR process.

The AP participated in all field research meetings (i.e., PR online event) contributing to the discussions that took place there. During and after the PR online event, the AP provided guidance to experts and other members of the PR team regarding the methodology and other issues related to the PR process.

Sviluppo Basilicata acted as the HP, which main role was to organise and host the PR event as part of the field research phase. The HP set the PR event agenda and invited the various stakeholders to participate in the interviews and debates. Before and after the PR event, the HP was responsible for communicating with other members of the PR team by providing supporting documentation and coordinating the PR event agenda. In particular, prior to the event, the HP provided the experts, SPs and AP with a report with a detailed analysis of the region of Basilicata.

Under this peer review exercise, the Granada County Council (Spain) and the Intermunicipal Community of Tâmega and Sousa (Portugal) played the role of SPs. The responsibility of SPs within the PR process was mainly to hire external experts and coordinate the communication between the HP and the respective experts. The SPs also participated in the PR event meetings, contributing to the exchange of knowledge and experiences, and identifying practices implemented in the HP that could be of interest to them regarding the digital transformation of their territories.

For the present peer review action, the Intermunicipal Community of Tâmega and Sousa hired the expert Augusto Ferreira (from AF Innovation Consulting), while Granada County Council hired Mauricio Álvarez (from Nazaríes IT).

The PR experts were responsible for implementing the PR activities according to the PRM Guidelines. Throughout the peer review process, the experts jointly carried out desk research and field research analyses in order to obtain useful information to prepare the PRR. Desk research was undertaken on the basis of information and documents provided by the HP and SPs, as well as other publicly available documents and information. During the field research phase (i.e., PR online event), PR experts were able to obtain further information and data on the digitalisation situation of Basilicata through interviews and discussions.

FIGURE 1. Structure of the Peer Review Team
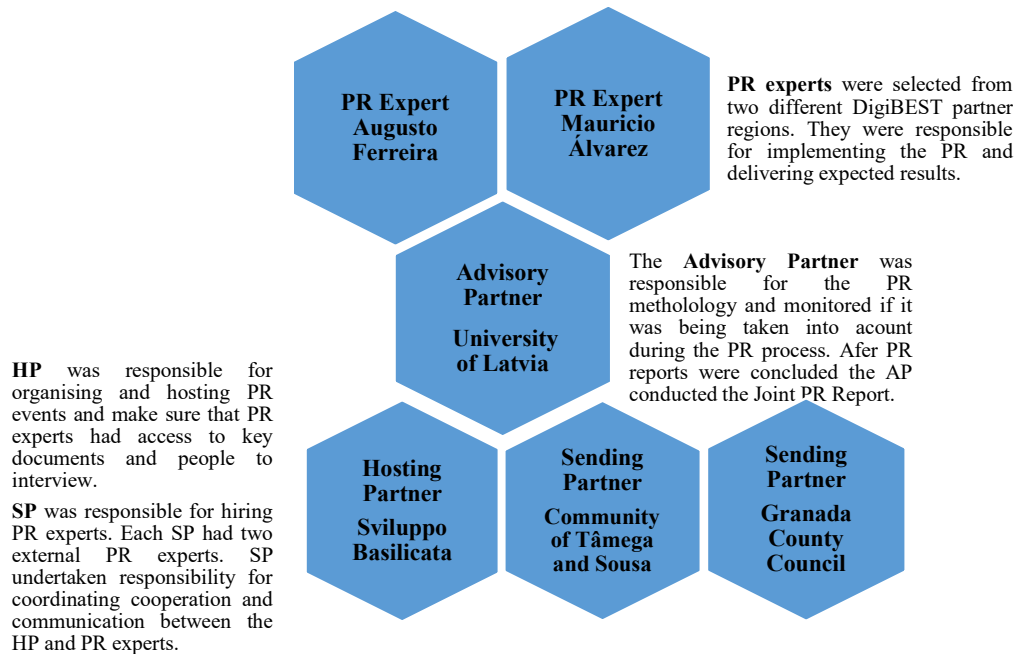
The Basilicata peer review team can be presented as follows (non-exhaustive list):

Hosting Partner (HP) – Sviluppo Basilicata:

- Patrizia Orofino. Head of Business Unit Internationalisation, manager of the Business Incubator of Potenza and project manager of Digibest. Degree in Law and master's degree in Executive MBA. She has 22 years of diversified experience in the field of EU cooperations projects, regional policy, project design, planning, scheduling and execution of projects, regional development, SMEs' internationalisation. Member of the Steering Committees of the projects carried out.

- Maria Giovanna Lecce. Project expert with an extensive experience in management of EU cooperation projects, Finance manager of D, Degree in Translation and master's degree in Local Development Management. Over her 20-year work experience, she gained a sound international knowledge and experience in transnational cooperation and internationalisation, project design and planning, elaboration and control of financial documents, drawing up of project activity reports, organisation of networking events, business to business meetings, international workshops, seminaries. Member of the Steering Committees of the projects carried out.

Advisory Partner (AP) – University of Latvia:

- Denize Ponomarjova. Since 2011 works as a project manager and coordinator at the Centre for European and Transition Studies, the University of Latvia - she has been involved in several EU funded projects, organised several international conferences and coordinated international scientific publications. She has also worked as an assistant of the ambassador and senior desk officer at the Embassy of the Republic of

Poland in Riga (2011-2015). She holds a MSc degree in European Studies (University of Latvia) and is a PhD candidate in Demography (University of Latvia).

– Davis Vītols. Project manager assistant at the University of Latvia, Centre for European and Transition Studies (since November 2020), main responsibilities – implementation of Interreg Europe project. Currently studying "International Business Administration" (BSc) at the Tilburg Univesity, Netherlands.

Sending Partner (SP) - Intermunicipal Community of Tâmega and Sousa:

– Susana Alves. Head of Multidisciplinary Team of the Investment and Territorial Promotion Agency of the Intermunicipal Community of Tâmega and Sousa. More than 15 years of experience in the design, planning and implementation of regional development projects in public organisations in the fields of tourism, culture, agro-food, entrepreneurship, internationalisation and business competitiveness, namely under the EU funding cycles Portugal 2020 (2014-2020), QREN (National Strategic Reference Framework 2007-2013) and QCA III (2000-2006). Extensive experience in organising national and international events and specialist in Marketing and Communication.

Sending Partner (SP) - Granada County Council:

– Ignacio Rosales Zabal. Economist and master's degree in Planning, Financing and Management of Development Projects. More than 20 years of experience in the design and management of local development projects, especially in the field of entrepreneurship support and SME's consolidation. Manager of the SME Incubator of County Council of Granada. Experience in EU transnational projects. Project manager of DigiBEST.

– Luis Ignacio Fernández Aragón Sanchez. Development technician, with 6 years of expeience working abroad in international cooperation managing different programmes of human development. Employment and development Agent in rural environment in the province of Granada. Project technician of DigiBEST.

Experts:

– Mauricio Álvarez García (Nazaríes IT). Business development consultant, currently developing PhD research about the investment and development in Innovation and R&D in Spain compared with other European countries.

– Augusto Ferreira (AF Innovation Consulting), consultant in science, technology and innovation (STI) policies, with special interest in Digital Economy, including business digital transformation, smart cities, and territorial digital strategies.

3 Peer Review implementation

Apart from the regional analysis report provided by Sviluppo Basilicata, the desk research task focused on documents that could inform, on the one hand, about economic and business activities, as well as the characteristics of the regional innovation system and, on the other hand, could enlighten on implemented public policies to support companies and organisations to innovate and digitalise.

Documents such as the Regional Operational Programme 2014-2020 funded by the European Regional Development Fund (ERDF), the Regional Operational Programme 2014-2020 funded by the European Social Fund (ESF), and the Regional Innovation and Smart Specialisation Strategy 2014-2020 also implemented under ERDF funding, provided key information and data to understand the current state of Basilicata's economy, society and innovation ecosystem, as well as the policy instruments that have been used to improve regional competitiveness.

Documents suggested by the Hosting Partner about the Basilicata region were also consulted, being useful to better understand the socio-economic regional framework, namely critical aspects such as the main economic sectors, business fabric, employment and qualifications, competitiveness, innovation and internationalisation. Examples of such documents include "Economie regionali - L'economia della Basilicata" (Banca d'Italia),[3] "Localizzare l'Agenda 2030: the case of Basilicata" (Fondazione Eni Enrico Mattei),[4] or "Report Regione Basilicata – Dati and informazioni sullo stato and sull'evoluzione del socio-economic profile of the territory" (Unioncamere),[5] which are all mentioned in the bibliography section together with the respective access links.

Several studies from international institutions such as the European Commission and the Organisation for Economic Cooperation and Development (OECD) were also examined in order to understand how such organisations see the strategic role that regions can play in supporting digital transformation of the businesses of the future. In addition to the EU Digital Economy and Society index (DESI), which summarises indicators on Europe's digital performance and tracks the progress of EU countries but has no information on NUTS 2 level regions, information was also checked on the "Digital Agenda for Europe" portal. Furthermore, documents such as "Shaping Europe's digital future" (European Commission),[6] "The state of digital transformation at regional level and COVID-19 induced changes to economy and business models, and their consequences for regions" (European Committee of the Regions),[7] and "Rural regions of the future: Seizing technological change" (OECD)[8] were also consulted (list provided in the bibliography section).

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[3] https://www.bancaditalia.it/pubblicazioni/economie-regionali/2020/2020-0017/2017-basilicata.pdf
[4] https://www.feem.it/m/publications_pages/2018-06-28testo-agenda2030.pdf
[5] https://www.basilicata.camcom.it/sites/default/files/contenuto_redazione_isin/notizie/file/report_regionale_basilicata_5_12_19_invio.pdf
[6] https://ec.europa.eu/info/files/communication-shaping-europes-digital-future_en
[7] https://data.europa.eu/doi/10.2863/37402
[8] https://doi.org/10.1787/ae6bf9cd-en

TABLE 2. PEER REVIEW DESK RESEARCH FINDINGS

No	Source of literature, document or information on the website reviewed or analysed	Date	Main findings and conclusions
	DigiBest Analysis of the Region of Basilicata	29.03.2021	The report sets the context for economic and business activities, innovation ecosystem and policies for digitalisation in Basilicata. It highlights that while significant progress has been made in digitalising SMEs (including technologies, processes and business models), there are still significant challenges to be overcome.
	Programa Operativo FESR Basilicata 2014/2020	08/2015	The regional operational programme, mainly through the first three axes, supports RTD activities (both entities of the scientific and technological system and companies), the implementation of a digital agenda by investing in broadband internet connection and digitalisation of public services, and the competitiveness of SMEs through innovation.
	Strategia Regionale Per L'Innovazione E La Specializzazione Intelligente (RIS3) 2014-2020	08/2015	RIS3 strategy is an integrated, regional-based economic transformation agenda built on Basilicata's strengths, competitive advantages and potential for excellence. Points out smart investment in five sectors in which the region should stand out: aerospace, automotive, bioeconomy, energy, and creative industries.
	Programa Operativo Nell'ambito dell'objettivo "Investimenti in favore della crescita e dell'occupazione" 2014-2020 (FSE)	November 2020	It focuses on the promotion of employment (including young people), social inclusion, and investment in skills, education and lifelong learning, apart from supporting the digitalisation of public services. It supports innovation processes in companies (articulation with ERDF regional operational programme and RIS3) through upskilling and reskilling of human resources (including owners of micro companies) and creation of new jobs. It also promotes digital literacy for population at large.
	EU Digital Economy and Society index (DESI)	Consulted in December 2021	It shows statistical evidence that Italy started as an underperforming country within the EU but has significantly progressed across all DESI indicators from 2014 to date, including connectivity, human capital, use of internet services, integration of digital technology and digital services.
	Innovation in Basilicata agriculture: From tradition to digital (D'Oronzio)	30.07.2021	Modernisation and restructuring of agricultural, agri-food and forestry farms by rural development policies.

TABLE 3. PEER REVIEW FIELD RESEARCH FINDINGS

Activity	Where and when	Stakeholders met	Policies and actions discussed
Interview	*Online Peer Review Event 14.12.2021*	ERDF Managing Authority: Mr Antonio Bernardo	Role of Basilicata ROP 2014-2020 in supporting innovation and digitalisation in SMEs
Interview	*Online Peer Review Event 14.12.2021*	Chamber of Commerce of Basilicata: Ms Daniela Marchese	Role of the Chamber of Commerce in supporting SMEs digitalisation, regarding particularly the "Punto Impresa Digitale" and "Growing in Digital" initiatives
Interview	*Online Peer Review Event 14.12.2021*	University of Basilicata, Technology Transfer Office: Ms Rosanna Piro	Role of the university in supporting SMEs in the fields of R&D, innovation and training, particularly in the area of digitalisation
Interview	*Online Peer Review Event 15.12.2021*	Confindustria Basilicata: Mr Simone Piedilato	Role of Confindustria in supporting SMEs digitalisation, regarding particularly the "Digital Innovation Hub" initiative
Interview	*Online Peer Review Event 15.12.2021*	Basilicata Creativa Cluster: Mr Raffaele Vitulli	Role of regional clusters in supporting SMEs digital transformation, in particular the "creativa cluster"
Interview	*Online Peer Review Event 15.12.2021*	Cluster of Energy: Ms Ida Leone	Role of regional clusters in supporting SMEs digital transformation, in particular the energy cluster

4   Objectives and tasks of the PR Experts

The content of the contracts of both experts was quite similar and had mainly to do with the following main objectives and tasks:

- Carry out the peer review exercise in an online format, focusing on the subject of digitalisation of SMEs and microenterprises in the Basilicata region.
- Analyse a regional study on the Basilicata region previously put together by the Hosting Partner (HP).
- Examine the policy instrument "ERDF Operational Programme Basilicata 2014-2020" and suggest possible proposals to enhance it.
- Study the potential transfer of good practices to Basilicata identified under the DigiBEST project.
- Identify the main challenges, barriers and difficulties in the digital transformation of SMEs and microenterprises in the region.
- Advise on possible solutions, recommendations and/or guidelines for the problems presented by the HP or other participants in the peer review action.

Experts have been required to perform the various tasks under three main phases:

- Phase 1: Desk research (document analysis).
- Phase 2: Field research (three-day online event hosted by the HP).
- Phase 3: Final report, which could be organised around topics such as:
  - Introduction.
  - Team presentation.
  - Peer review implementation process.
  - Experts' goals and tasks.
  - Characteristics of digitalisation in SMEs.
  - Policy framework.
  - Main barriers to SMEs digitalisation and possible solutions.
  - Relevance of good practices.
  - Results and conclusions.
  - Recommendations.

The experts decided from the beginning of the assignment not to divide specific tasks among themselves, but rather to work together to, first, gather the most relevant information (either in the desk research phase or in the field research phase), and then for critically treat information in order to issue solidly supported advice.

It is believed that this methodology brought several advantages to the work carried out. On the one hand, it ensured that whatever the topic under analysis, there would be always two insights into the facts, continually allowing a double check on all material collected and produced. Such mutual validation of research activities prevented that an individual error of judgment could lead to erroneous outputs.

On the other hand, it allowed permanent valuable feedback between the two experts, as they were both knowledgeable about all the issues. For example, during the field research phase (interviews), this allowed for greater flexibility when asking questions to interviewees, since any of the experts could ask any question from the previously prepared questionnaire, thus leading to a more effective and dynamic way of obtaining information from each respondent.

Although this methodology was more time consuming to complete all the tasks, it proved to be more effective to guarantee conclusions and recommendations with greater validity, quality and robustness.

Without tending to an excessive specialisation, it is however true that the professional background of the involved experts was used in a logic of complementarity. Augusto Ferreira has been working more on the development of territorial digitalisation strategies (mainly at regional and city levels), while Mauricio Álvarez is a business developer specialist with experience in digital transformation in manufacturing and service sectors. This diversity of knowledge and experience has been useful for a holistic study of the Basilicata region, both with regard to public policies for digital transformation, as well as to concrete support (e.g., technologies and processes) that SMEs need for digitalisation processes.

5   Characteristics of the SMEs digitalisation

Country level of digitalisation in EU and national level

Italy ranks 20th out of 27 EU Member States in the 2021 edition of the Digital Economy and Society Index (DESI). The country has registered significant progress in all the dimensions of DESI from 2014 to today, namely in what concerns to connectivity, human capital, use of internet services, integration of digital technology and digital advertising services.

At national level, Italy adopted the Strategy for Digital Growth 2014-2020 and the Strategy for Ultra Broadband in March 2015. In September 2016, the country established its Industry 4.0 strategy which was renamed National Industry 4.0 Plan in 2017, to better reflect the broad scope of the initiative, including both service sector companies and companies of the industrial sector.

Level of digitalisation of SMEs

Regarding the level of digitalisation of SMEs, Basilicata shows significant growth potential, not only due to the large number of investments focusing on promoting digitalisation and internet connectivity throughout the region (including in rural areas), but also by the proactivity of various institutions in the territory able to carry out different initiatives that can make a difference in the digital transition of local companies.

Nevertheless, several shortcomings have been noticed, such as SMEs' limited skills in digititalisation and lack of knowledge to acquire digitital tools and develop innovation processes, as well as general poor internet connection in rural areas.

It should, however, be emphasised that various strategies and initiatives have been developed to enhance the digitalisation of companies, as well as the development of fast Internet connectivity infrastructure, which allows significant percentage of the population to be already covered by fast connection. Progressive digitalisation of SMEs has been achieved, including digital technologies, processes and business models, and the digitalisation of regional and local administration has increasingly occurred.

Policies, developments and activities to promote SMEs digitalisation

Regional policy measures to support SMEs competitiveness (including digitalisation), in particular through the Regional Operational Programme (ROP) 2014-2020 and the brand-new ROP 2021-2027, should be considered important Basilicata's assets in the fields of RTD, innovation and digital transition.

The relevant role of the Basilicata operational programme 2014-2020 funded by the European Social Fund should also be highlighted in supporting the skilling and upskilling of the region's workforce, digital literacy in the population in general, ICT investments in schools, teachers' training and students' education, and digital capacity building at public administration.

Basilicata's main regional policy orientation concerning business competitiveness and innovation stem from the Regional Innovation and Smart Specialisation Strategy (RIS3) 2014-2020, which significantly shaped the ROP 2014-2020 and will continue to influence the ROP

2021-2027, especially regarding the support to RIS3 selected sectors: aerospace, automotive, bioeconomy, energy, and creative industries.

At the national level, emphasis should be given to the National Innovation Plan 2025 addressing digitalisation, technological innovation and ethical and sustainable development, as well as the National Recovery and Resilience Plan (RRP), which identifies innovation and digital transition as key priorities for investment.

As further explained below in Chapter 6 - Policy Context, apart from regional public funding, SMEs located in Basilicata can also be supported in their digital transformation endeavours through the "National Operational Programme on Enterprises and Competitiveness 2014-2020", and "SME Initiative Operational Programme 2014-2020".

Last but not least, initiatives led by local stakeholders, such as the Digital Innovation Hub, Punto Impresa Digitale and Growing in Digital are showing very positive outcomes and can be presented as good examples to any other European region.

Main actors

The local innovation ecosystem, considering that Basilicata is a region with relatively small population, has diverse actors that can ensure complementary roles in promoting regional innovation.

One of the most relevant is certainly Sviluppo Basilicata, the financial regional company. The ERDF and ESF managing authorities, insofar as they manage abundant resources that are critical to the development of Basilicata, and the Office for Internationalisation, Scientific Research and Technological Innovation of the Region of Basilicata, must also be considered crucial entities for supporting the digital transformation of the region at large, and the business community in particular.

Other relevant institutions and organisations are the University of Basilicata and its research centres; the Chamber of Commerce; Confindustria; and the several clusters based in the region representing either the most important sectors or sectors having the greatest potential for excelling at international level, namely the automotive, energy, aerospace and creative industries clusters.

Main barriers for SMEs digitalisation

The barriers for the digitalisation of SMEs have different nature. On the one hand, there is limited access to high Internet connectivity, despite great efforts made to improve connectivity infrastructures in the region. On the other hand, the shortage of digital skills in SMEs and insufficient digital literacy among small business entrepreneurs, have usually led to a low adoption of digital technologies and processes.

Another challenge to be addressed is the scarce knowledge and resources that reduce the ability of SMEs to hire ICT experts (internal or external). Considering that small companies, and especially micro companies, are the vast majority in the territory, the most effective way to address this issue would be to resort to ICT specialised support whenever necessary.

Insufficient collaboration among companies could also be pointed out as an obstacle for higher innovation, as business synergies in areas where companies have little expertise could help to improve their performance in the market. As commented in the interviews, many companies have a conservative mindset, so the risk aversion of investing in digitalisation can be, together with the necessary organisational changes this may imply, a barrier to digitalise businesses. It is always difficult to change the organisational form of a company that has been operating in the same way for many years.

Possible solutions to improve the situation

In order to deeply understand the ecosystem, the regional authority could identify the actors in Basilicata who are potential providers as well as beneficiaries of knowledge and technologies to create a collaborative and integrated digital innovation ecosystem, which can become a stable basis for the digital transformation of SMEs in the region. Strategies for economic development, competitiveness and innovation could be connected to a strategy for digital transition.

In order to significantly expand the use of digital technologies, physical and virtual technology marketplaces for digital innovation could be launched. Intermediaries for digital innovation, such as clusters, business associations or ICT companies, which are offering digital products and solutions to businesses, could be used to foster digital transformation in SMEs, contributing to facilitate the creation of physical and virtual tech marketplaces that use digital innovation as a service. Besides the technical push by intermediaries, SMEs also need organisational and business expertise for the transition of their business models towards new paradigms.

The digital transformation of the public sector has to be robustly developed, not only to raise awareness among public employees and end users (businesses and citizens) about the potential of digital solutions, but also to produce a pull effect of digital transformation throughout the society, so this can be an example for the rest of the stakeholders and companies, showing more visibly the advantages that digitalisation can generate.

In order to overcome financial barriers to digital transition, it is necessary to facilitate support for the implementation of any kind of digital transformation in SMEs, paying particular attention to micro and small enterprises. Vouchers and grants, which have been the most common instruments used to support SMEs in Basilicata, should continue to be made available to small businesses under the next cycle of ERDF support. On the other hand, the rural-urban digital divide should be addressed through a better understanding of the needs of Basilicata's rural SMEs in terms of the type of digital transformation and type of support required. As already argued in other parts of this report, specific measures for small and micro businesses could be considered with support from ERDF and ESF funding, particularly to those based in the remotest areas.

Regional and local authorities could recognise the potential of e-commerce and work more closely with third-party e-commerce companies, so that they can provide guidance on their websites about e-commerce sites, thus increasing SMEs' sales and visibility in Italian and foreign markets. Incentives could also be offered to SMEs to digitalise payment processes, which would allow them to boost their commercial flows, increase sales and improve exports (e.g.: Commercetools, Sales Force, Shopify). These tools would help to have a greater number of online sales and an updated monitoring on them. In turn, they can also be used as CRM -

Customer Relationship Management to contact customers more easily through a database in the form of a newsletter and promoting online payments through various means (e.g., Virtual POS, PayPal, Google Pay, Apple Pay, Amazon Pay, etc.).

Recruiting employees with appropriate digital skills is a main constraint for SMEs. This may be particularly challenging in less populous regions like Basilicata that also include remoter rural labour markets. This requires collaborative local efforts involving for instance the university, training institutions (e.g., clusters, business associations) and employers – including SMEs – to deliver qualifications that reflect local labour market needs.

New training centres for digitalisation and digital tools could be considered. The number of institutions providing training services in digitalisation seems to be insufficient to respond to the needs of Basilicata's labour force. There seems to be room for higher offer in this field, including the creation of new training centres that could also support businesses through ICT technologies applied to production processes, such as digital manufacturing, automation and robotisation, artificial intelligence and data driven processes, IoT, virtual, augmented and hybrid reality, etc.

Training on ICT technologies could also be delivered through public access e-Learning platforms (e.g.: Linkedin e-Learning, E-lingua, Twenix), which could be a solution to the upskilling and reskilling of the region's labour force, for instance through collaborative local efforts among the university, clusters, business associations and employers (including SMEs).

Finally, covering multiple target audiences regarding the development of digital skills would benefit the region as a whole, namely:
- – SMEs. In addition to the staff, training actions should focus on of small business owners.
- – Citizens. Support the population at large by developing citizens' digital skills towards greater civic participation and social inclusion, namely promoting new technologies and digital literacy, training actions on Office tools, internet training for beginners, cybersecurity, etc.
- – Children. Support the youngest generation to be proficient in digital skills through the provision of education on the use of ICT tools, including Office tools and internet training for beginners, privacy and cybersecurity (basic level), introduction to computer programming, graphic design, and WEB page development and management.

Comparison of the host country and the SPs' and experts' home countries in the field of SMEs digitalisation

Italy (PR Hosting Partner) and Spain and Portugal (PR Sending Partners' and experts' home countries) have achieved positive evolution in the field of SMEs digitalisation, as suggest the indicators of the EU Digital Economy and Society index (DESI). The three countries have a feature in common that is the significant use of EU Structural Funds to support their digital transformation endeavours.

It is interesting to note that the three countries launched a common organisation - COTEC Europa - whose main objective is to provide member companies in the respective countries (Fondazione COTEC, Fundación COTEC and COTEC Portugal) with the opportunity for transnational reflection and dialogue on common problems. COTEC Europa meetings are held

annually in Italy, Spain and Portugal on a rotating basis and the chairmen of the national COTECs are the President of Italy, King of Spain, and President of Portugal. In recent years, the digital transformation of companies has been strongly highlighted at COTEC Europa's annual meetings.

In-depth analysis of the DESI index for the three countries suggests, however, there are inequal performances regarding several digitalisation indicators, as well as different challenges to which they seek to respond.

Spain ranks 9th among the 27 EU Member States in the European Commission's 2021 edition of the Digital Economy and Society Index (DESI). Spain is a strong performer in Digital public services thanks to the digital-by-default strategy throughout its central public administration. Spain also performs very well in Connectivity, although gaps between urban and rural areas remain. On Human Capital, Spain ranks 12th and has been improving over the last few years, but there is still room for progress, especially on the Information and Communication Technologies (ICT) specialist indicator. Spain ranks 16th on the integration of digital technologies; its score is in line with the EU average and the increase in Small and Medium-size Enterprises (SMEs) selling online is significant.

There are various centres where people of different ages can go to train with technological tools. In turn, the chambers of commerce also offer help to companies to expand their contacts through business meetings and webinars. The government offers, through different financial aids, support for companies so that they can digitalise their processes and use 4.0 technology tools and get the chance to invest in marketing and digital platforms in order to promote online sales. Rural areas and companies dedicated to the agricultural sector are increasingly involved in IoT technology due to the advantages that it provides.

Portugal ranks 16th of the 27 EU Member States in the 2021 edition of the Digital Economy and Society Index (DESI). On connectivity, Portugal performs well in VHCN (very high-capacity network) and fast broadband coverage, leaping from 56% to 63% in at least 100 Mbps fixed broadband, ahead of the EU's 34% average. The proportion of Portuguese enterprises with at least basic digital intensity stands at 51% versus an EU average of 60%. National companies exceed the EU average on the use of ICT for environmental sustainability, SMEs selling online, and AI use. Regarding digital public services, e-government users have increased to 57%, still trailing the EU's 64% average.

In 2020, Portugal approved the national action plan for digital transition, which prioritises digital inclusion, business digital transformation, public administration and digitalisation of education. In the Portuguese Recovery and Resilience Plan (RRP), the contribution to the digital objectives amounts to 22.1% of RRP's allocation, exceeding the digital target of 20%. The operational programmes funded by the ERDF at national, regional and sub-regional levels have clearly supported SMEs digital transition, investing heavily in computer equipment, software (including standard and bespoke software), ICT and business development services, and human resources training (also with ESF funding).

6 Policy context

There is a favourable national context for innovation and digital transition of Italian companies. The establishment of the National Innovation Plan 2025 to address key issues such as digitalisation, technological innovation and sustainable development, shows the commitment of the government (and in particular of the Ministry of Technological Innovation and Digital Transition) to decisively advance the country in matters such as the digitalisation of public services and the private sector, widespread application of advanced technologies in fields such as blockchain, artificial intelligence (AI), Internet of Things (IoT) and cryptocurrency, and the promotion of local innovation through digital infrastructure, emergence of start-up companies, and new innovation hubs and ecosystems.

The new national Recovery and Resilience Plan (RRP) points out innovation and digitalisation as key priorities for investment. In line with the National Innovation Plan 2025, the RRP will make available, in the next few years, very significant investments in innovation and digital transformation of the state, economy and society.

In addition to the support available at regional level, companies and especially SMEs based in Basilicata can use national funding for their innovation activities.

The National Operational Programme on Enterprises and Competitiveness 2014-2020 (*Ministero dello Sviluppo Economico*), funded by ERDF, supports less developed and transition regions in four thematic priorities:
- Strengthening research, technological development and innovation, promoting in particular business investment in R&D and innovation.
- Improving access to and use of ICT, namely through the development of high-speed broadband infrastructure (100 Mbps and higher) targeting areas of high concentration of companies.
- Enhancing competitiveness of SMEs, for instance through the promotion of entrepreneurship, implementation of new business models and support to increased capacity to develop new products and services, and internationalisation.
- Supporting a low carbon economy, particularly through the use of renewable energy in businesses and implementation of smart energy distribution systems.

Furthermore, through the "SME Initiative" Operational Programme 2014-2020 (*Ministero dello Sviluppo Economico*), Basilicata's small companies may also access to credit for investment and creation of jobs.

The Basilicata Regional Operational Programme (ROP) 2014-2020, funded by ERDF, is the main policy instrument to support innovation and digital transformation in the region at large, and in companies in particular.

The ROP was designed to support the main strategic lines identified in the Regional Innovation and Smart Specialisation Strategy (RIS3) 2014-2020, which was established as an economic transformation agenda built on Basilicata's strengths and competitive advantages. In the framework of the RIS3 strategy, five priority domains have been selected, which have the potential to stand out nationally and internationally: aerospace, automotive, bioeconomy, energy, and creative industries.

The ROP 2014-2020 was organised around eight main axes, being the first three the most directly related to supporting innovation and digitalisation: Research, Technological Development and Innovation (Axis 1); Digital Agenda (Axis 2); and Competitiveness (Axis3).

The main objective of Axis 1 is to enlarge the regional scientific and technological system (e.g., higher education institutions, research centres), as well as to improve R&D and innovation capacity of the business community.

Axis 1 supports a wide range of activities through its main lines of action: 1) support to research infrastructures considered critical for the regional innovation system; 2) acquisition by companies of technological, strategic, organisational and commercial innovation services; 3) participation of regional actors in technological specialisation networks (e.g. clusters), as well as in European RTD and innovation programmes (e.g. Horizon 2020); 4) implementation of complex R&D projects under relevant thematic areas for the regional smart specialisation strategy.

The main objective of Axis 2 - Digital Agenda - is to extend broadband infrastructure in the region to allow high speed internet access, but also to significantly increase the digitalisation of local public administration and public services provided to citizens and businesses.

The main lines of action in this axis are as follows: 1) implementation of ultra-broadband internet, including in areas of high economic production and rural areas; 2) digitalisation of internal processes of public administration in areas such as justice, health, tourism and culture; 3) interoperable e-governance services aimed at citizens and businesses, including smart cities solutions; 4) technological solutions for digital literacy and social inclusion, prioritising disadvantaged citizens and rural areas.

The Axis 3 focuses on increasing the competitiveness of companies based in the region, including assistance to the sectors selected under the RIS3 strategy, regeneration of local production systems that are in a difficult situation, creation of new companies, internationalisation of the Lucanian economy, and implementation of financial engineering tools aimed at SMEs.

The main lines of action for Axis 3 are: 1) support to the launch of innovative companies through direct incentives, provision of services and microfinance; 2) assistance to territorial areas affected by production crises/industrial transitions; 3) support competitive repositioning and readaptation to the markets, including investment attraction, investment in infrastructures, launching of new activities, training actions (with the possibility of using ESF funding), and creation of self- employment; 4) support to production investment, including premises, machines and equipment, reorganisation of production processes, new organisational and commercial solutions, launch of new products/services, costs with industrial property protection, occupational safety, acquisition of consulting services etc; 5) support to the development of new products and services in the cultural, creative and tourism sectors; 6) strengthening of the public credit guarantee schemes to facilitate SMEs access to credit; and 7) development of the venture capital market to support start-up companies in the pre-seed and seed phases.

Another instrument that is worth taking into account regarding the effort that the region is making towards digital transformation is the Regional Operational Programme Basilicata

2014-2020 funded by the European Social Fund (ESF) (i.e., "Programa Operativo Nell'ambito dell'objettivo "Investimenti in favore della crescita e dell'occupazione").

In addition to lines of action aimed at solving problems related to employability (especially youth employment), fight against poverty and social exclusion, the programme includes several measures related to lifelong learning and upskilling and reskilling of the regional labour force in view to mastering new technologies and, in particular, digital technologies.

It is important to note that the programme supports the regional education system by training teachers and students in digital skills and supporting the acquisition of computer equipment (hardware and software). It provides also funding for distance learning activities, including the purchase or rental of the necessary equipment for distance education and training, such as laptops, software, costs with broadband internet connection etc.

The ESF operational programme also supports digital literacy in the population at large and includes specific measures targeting local employed and unemployed labour force, including fixed-term workers, self-employed workers, and owners of small and micro-companies.

It should be noted that this programme is implemented in conjunction with the ERDF ROP and RIS3 strategy. For example, ERDF funded business investments can be complemented with ESF investments in skills development. Another example has to do with the Digital Agenda (Axis 2 of ERDF ROP), which has been put into practice in complementarity with ESF ROP funding.

The investments approved under the ESF operational programme also take into account RIS3 strategy priority areas, as well as existing regional clusters. For example, it was planned within the programme to provide specific support for training actions and skills development in the domain of creative industries, culture and tourism.

In conclusion, it can be said that the ERDF ROP 2014-2020, as the main instrument to support business innovation in Basilicata, offers a rather diversified and complete set of actions to support companies, and in particular SMEs. In fact, in a non-exhaustive list, businesses can through the programme obtain funding for activities as varied as R&D (in-house or in conjunction with one or more entities of the scientific or technological system); industrial property protection; innovative and greener production processes, including investments in premises, machinery/equipment and acquisition of external support services; launch of new products/services; new management processes, including organisational, marketing, and implementation of quality and innovation management systems; access to new markets and internationalisation; participation in wider national and European networks for technological specialisation, RTD and innovation; access to credit schemes and venture capital schemes; launch of innovative start-up companies etc.

Most of this support is provided through non-refundable grants up to 50% of eligible costs, although credit schemes are also provided by the programme.

Lucanian companies can also use the national programmes supported by the ERDF (namely the National Operational Programme on Enterprises and Competitiveness 2014-2020, as well as the "SME Initiative" Operational Programme 2014-2020 available for the "Mezzogiorno" regions), which increase the chances of obtaining direct funding through grants or credit. They

can also resort to the multiple support actions provided by the ESF Basilicata Operational Programme 2014-2020 for capacity building and skills development.

As the topic of digital transformation is transversal to all business innovation processes, the opportunities presented above correspond to a large extent to the opportunities Lucanian companies have had in recent years to obtain public support for their digitalisation endeavours, including new technologies, new processes and new business models based on digital solutions.

Taking into account its objectives, the effectiveness of the ROP 2014-2020 must consider not only its content but also the capacity of the regional business community to take full advantage of the opportunities offered by the programme. The field research carried out under this review exercise, particularly in the context of the interviews, showed some anecdotal evidence that certain characteristics that predominate in the region's companies may be limiting a better use of this instrument, particularly with regard to the topic of digitalisation.

This includes the size of the vast majority of companies that have fewer than 10 employees (micro companies) or 50 employees (small companies); traditional low expenditure in R&D and innovation activities; little collaboration culture with external entities supporting R&D and innovation; scarce cooperation with other companies; low digital literacy among small business owners; low digital skills leading to scarce adoption of digital technologies; and limited capacity to engage ICT experts.

Bearing in mind these shortcomings, some measures could be considered to make the operational programme more effective in increasing SMEs competitiveness and digitalisation:

– Positively discriminate micro companies in accessing funding for innovation and digitalisation. This could include specific launching of calls for proposals only for micro and small companies (and especially for those located in rural territories) up to a certain amount of investment. Delegation of the management of these calls could be decentralised in rural territories, being entrusted to groups of municipalities or other entities at sub-regional level.

– Funding regional or sub-regional networks for digital transformation of micro and small companies, made up of public and private entities on the supply and demand sides of digital support services. This should be accompanied by a better understanding of the needs of Basilicata's small firms in terms of type of digital transformation needed and type of support required.

– Encourage more collective projects involving various actors of the regional innovation system (region, university, RTD/innovation support centres, business associations, clusters, digital service providers) to the detriment of one-to-one projects in which a SME works with only one service provider (e.g., vouchers). In addition to faster diffusion of new knowledge and new technologies, this would also help to streamline the innovation ecosystem and combat the lack of a cooperation culture.

– Enhance and intensify the articulation with the ESF operational programme in order to improve training actions and the development of digital skills in small companies, including the respective owners.

7 Main barriers for SMEs digitalisation and possible solutions

Awareness Raising and Collaboration

The challenges facing by the region regarding the "Awareness raising and collaboration" topic are based on a certain lack of collaboration tradition between the main actors of the regional innovation system, namely among regional authorities, university, research centres, business associations, clusters, companies and the various organisations that can provide support for technological development, innovation and training.

In particular, the lack of cooperation between SMEs and entities of the scientific and technological system, and among SMEs themselves, makes it more difficult for small companies to develop innovation activities. It is no coincidence that the indicators in which Basilicata's SMEs stand out the most on the EU Regional Innovation Scoreboard are those related to non-R&D innovation expenditure and product/process innovators, proving they are used to looking for in-house solutions and buying mature technologies to address increasing market demands.

Some initiatives implemented in the region to bring stakeholders closer together to promote joint actions to raise awareness and promote capacity building for digital transition have achieved very relevant results. These are the cases of the Digital Innovation Hub led by Confindustria Basilicata, and Punto Impresa Digitale implemented by the Chamber of Commerce of Basilicata.

The various focus groups created under the RIS3 strategy brought new momentum to the regional innovation ecosystem, as well as the work carried out by the region's clusters, although still very much based on specific collective projects which, when discontinued, interrupted the previously developed collaboration.

A set of new actions could be considered in order to increase interactions among the main players of the innovation ecosystem:

- **Boost science-business cooperation at regional level,** namely through the support of multilateral projects involving SMEs, large companies (including multinational) and entities of the scientific and technological system, so as to create new momentum in the interaction between scientific/technological entities and the business community. European structural and investment funds (e.g., ERDF and ESF) could be used in the framework of the future regional operational programmes (ESF and ERDF). Such cooperation must stop being sporadic and become more regular, natural and spontaneous.

- **Deeply understand the ecosystem.** The region could identify the actors in Basilicata who are potential providers as well as beneficiaries of knowledge and technologies to create a collaborative and integrated digital innovation ecosystem, which can become a stable basis for the digital transformation of SMEs in the region.

- **Better signposting digital support.** Large numbers of businesses (especially micro businesses) may find difficult to identify external digital support. The region, in collaboration with relevant stakeholders, could launch a regional-wide initiative with

the aim of identifying and disseminating existing support in Basilicata to help companies, in particular SMEs, in their digital transformation processes. This could include a **"directory of providers"** of digital support, which could also offer support for new providers to promote their services, as well as a **"single information portal"** which could gather on just one portal or website information related to digitalisation, for instance training opportunities, e-commerce, fast internet connectivity, cybersecurity etc.

– **Establish and implement a regional digitalisation strategy**. Rather than implementing isolated measures to create the necessary conditions for small businesses to be more successful in digital transition processes, the region could consider launching an integrated strategy for digitalisation, aligned with key regional development and innovation priorities, engaging key stakeholders across different economic sectors and the scientific/technological system, built around a shared and inspiring vision, and led by a suitable governance structure.

Enabling Corporate Environment and Capacity Building

Under the "Enabling Corporate Environment and Capacity Building" topic a number of challenges have been found, which relate mainly to limited digital skills available in the region and scarce adoption of ICT technologies, reduced capacity of SMEs to innovate and digitalise, and uneven distribution of broadband infrastructure across the territory, with clear disadvantage for rural areas. Another problem that needs to be resolved is the loss of qualified young people who leave the region (brain-drain).

As far as broadband infrastructure is concerned, there are plans to cover an entire orographically complex region over the next few years. On the issue of digital skills, especially of the active population, it has already been seen in previous paragraphs that, in addition to successful initiatives such as Digital Innovation Hub, Punto Impresa Digitale and Growing in Digital, the region expects University of Basilicata to educate young graduates in digital technologies, as well as national and regional programmes (especially those financed by the ESF) for upskilling and reskilling employed and unemployed population.

Some new initiatives could be considered in the future to enhance the development of digital literacy and digital skills:

– **Scientific excellence in ICT**. Reinforce the profile of the University of Basilicata as an entity of scientific excellence in education and research in ICT technologies. The university could consider increasing the number of graduates in the ICT field. Furthermore, financial incentives could be provided to the university to create new university diplomas in emerging areas, increasing the number of students in courses with high demand.

– **Attraction of highly skilled talent.** The reinforcement of scholarship systems for international students in higher education (including PhD students and researchers) could be pondered in Basilicata, in order to enhance the attraction and retention of talent.

- **Strengthen teaching in STEM areas**. In order to develop, retain and attract digital skills in the region, endeavours should be made in order to introduce digital and programming skills since the first cycle of studies, and make more attractive further studies in secondary and higher education levels in STEM areas.

- **New training centres**. The number of institutions providing training services for the development of digital skills seems to be insufficient to respond to the needs of Basilicata's labour force. There seems to be room for higher offer in this field, including the creation of new training centres that could also support businesses through ICT technologies applied to production processes, such as digital manufacturing, artificial intelligence (AI) and data driven processes, virtual, augmented and hybrid reality, IoT etc.

- **Digital skills development in SMEs' staff**. Another means to help address the digital support needs of small businesses in Basilicata is to improve digital skills of small business owners and their staff. A collaborative local effort involving the university, clusters, business associations and employers (including SMEs) could be a solution to address this issue.

There is a broad range of factors influencing businesses' capacity for innovating, which include internal culture and values, skills, geographic location, collaboration with the surrounding innovation ecosystem, training, financial capacity, material resources, productivity etc. And it's well known that capabilities to innovate do not change overnight.

In any case, the innovation capacity of micro and small companies in Basilicata can be more quickly reinforced and accelerated if there is greater collaboration with external entities (including other companies), more material and public financial resources for innovation activities, and if more high-tech and knowledge-intensive companies are created in the territory. The following three measures are therefore proposed to help enhance companies' innovation and digital transition:

- **Overcoming financial barriers to digital transformation**. It is necessary to facilitate support for the implementation of digital transformation in SMEs, paying particular attention to the needs of the micro and small companies. Specific measures could be adopted to assist micro companies, for example specific calls for proposals for them, particularly if based in rural areas.

- **Innovation ecosystem at the service of SMEs**. It is necessary to promote multilateral projects bringing together the region's main stakeholders, in order to gather the knowledge, experience and resources necessary to respond to the specific digitalisation needs of small businesses. Instead of one-to-one projects in which an SME works with only one service provider, micro and small companies would benefit from working with a wide range of partners for a faster diffusion of knowledge, technologies and processes.

- **Technology-based entrepreneurship.** New companies, especially if they are technology- and/or knowledge-based (e.g., university spin-off companies), invest more than average in new products, technologies and business models that can positively "contaminate" the regional innovation system. They are also able to retain and attract talent from elsewhere. Investment in this type of businesses, especially

generated from universities and technology centres but also from other innovative companies (e.g., corporate spin-offs), should be a priority within Basilicata's policies.

Financial and Economic

Like other regions in southern Italy, Basilicata faces the challenge of improving the competitiveness of its economy and improving its relative position in the ranking of innovative regions in the country and in Europe. Greater internationalisation of its companies and organisations must also be a goal the region must seek to achieve, including attracting investment and talent.

The investment in scientific excellence, permanent interaction between the scientific and business communities, promotion of high-tech entrepreneurship and attraction of foreign investment seem to be the long-term solutions to change the current situation:

− **Scientific excellence**. Being internationally recognised as excellent in a particular scientific area is one of the most important assets to win the competition for Foreign Direct Investment (FDI). Investment in higher education and RTD in relevant areas are essential for the international recognition of Basilicata as an innovative region.

− **Science-business cooperation**. European funding (e.g., ERDF and ESF), namely through the support of multilateral projects involving SMEs, large companies (including multinational) and entities of the scientific and technological system, can create new dynamics in the interaction between scientific/technological entities and the business community.

− **Technology-based entrepreneurship**. The most innovative and transformative projects are often led by new companies. The entry of new companies and the investment in new products, technologies and management models are crucial to increase regional competitiveness and innovation.

− **Foreign Direct Investment**. Attracting FDI is essential to improve integration into global value chains. If Basilicata succeeds to bring together a reputable university and international recognised research centres, highly qualified human capital and efficient logistical networks, could be on the radar of large multinational companies.

Policy and Security

One of the recognised issues in the region is a certain divide between rural and urban areas (especially around the towns of Potenza and Matera). As discussed above in this chapter, one of the most evident solutions to alleviate this issue is a more balanced distribution of the broadband infrastructure that allows high internet connectivity. There seems to be a certain delay in relation to the initial plans to cover the entire territory, which is hampering the digital transition process for companies located in the most remote areas.

Some measures could be considered to support the digitalisation endeavours of rural-based SMEs, some of which could be included in the new Regional Operational Programme 2021-2027:

- **Identification of rural SMEs needs**. There should be a better understanding of the needs of Basilicata's rural SMEs in terms of type of digital transformation and type of support required.

- **Specific measures for small companies.** Tailored support to the needs of small or micro companies could be considered, including for instance specific calls for proposals for them (and especially for those located in rural territories).

- **Consortia to support small businesses**. Regional or sub-regional funded networks for digital transformation of micro and small companies could be created, made up of public and private entities on the supply and demand sides of digital support services.

8 Relevance of Good Practices

The Hosting Partner (HP) included in the regional report three good practices carried out in the region, which were afterwards presented more in detail during the peer review event by the stakeholders responsible for their implementation:

- Digital Innovation Hub, implemented by Confindustria Basilicata, is an information and consulting office in technological innovation and digitalisation.

- Punto Impresa Digitale, led by the Chamber of Commerce of Basilicata as an initiative of Unioncamere (Italian Chambers of Commerce), provides support such as digital maturity assessments, training, and consulting services.

- Growing in Digital, also implemented by the Chamber of Commerce of Basilicata, offers young people training placements at companies, hence creating job opportunities for them while giving employers a chance to recruit skilled young employees.

The three initiatives, based on different but somehow complementary concepts, are good examples of how to foster SMEs digital transition and could be interesting for any other European regions interested in the topic. All the three schemes demonstrate already sufficient maturity and quite robust outcomes, having undoubtedly contributed over the last few years to support the digitalisation of companies based in Basilicata.

Regarding the identification of successful practices for the consideration of the Basilicata region, the team of experts would like to suggest the following schemes, which take into account the main needs identified in the region, as well as its main characteristics and stated objectives for the future:

- Development of high-speed digital networks in rural areas: "Digital networks (fixed and mobile) in non-commercially viable areas" (Norway). [Table 4]

- Capacity building and digital skills in SMEs and population at large: "Guadalinfo - a social network of inhabitants in Andalusia" (Spain). [Table 5]

- Single spaces (physical and digital) where all public services are provided to SMEs and start-ups: "Business Space" (Portugal). [Table 6]

- Creation of knowledge- and technology-based firms in rural areas, particularly in the ICT field: "Granada Empresas" (Spain) [Table 7] and "Andalucía Open Future (AOF)" (Spain). [Table 8]

- SMEs internationalisation through the use of digital solutions: "Consultancy on business support" (Latvia). [Table 9]

- Support to the managing authorities of regional operational programmes to evaluate whether projects include relevant investments in Industry 4.0.: "Industry 4.0 Referential" (Portugal). [Table 10]

– Reinforcement of ICT scientific and technological excellence in agriculture: "Master's Degree in Digital Agriculture and Agri-Food Innovation" (Spain). [Table 11]

TABLE 4. GOOD PRACTICE "DIGITAL NETWORKS IN NON-COMMERCIALLY VIABLE AREAS"

Good practice general information	
Title of the good practice	*Development of digital networks (fixed and mobile) in non-commercially viable areas*
Category of the good practice	*Please choose one of the categories:* ▉ *Awareness rising and collaboration;* ▉ *Empowering tools;* ▉ *Sustainability instruments;* ☐ *Enabling environment;* ☐ *Other*
Organisation in charge of the good practice	Trøndelag County Authority
Description	
Short summary of the practice	Digital transformation depends on access to networks, both fixed and mobile. Most of the development of networks takes place on a commercial basis, and coverage improves from year to year. However, the areas that still lack coverage, either fixed or mobile, must be expanded with public subsidies. From 2020, the Trøndelag County Council has assumed responsibility to be a driver, coordinator and facilitator in collaboration with the municipalities regarding the expansion of those networks. This will ensure that businesses, households and other areas where people travel should have access to a timely and stable network. In the national context, Trøndelag is the foremost when it comes to developing high-speed digital networks in rural areas. And the region's efforts are often used as an example for other counties and municipalities. SMEs located in rural areas are cornerstones in the local communities. Trøndelag has a lot of remote rural areas, and the SMEs are imperative to maintain the population. Access to high-speed internet is imperative. This is a regional development task that is viewed as extremely important at both local, regional and national level. It is a question on survival first, and digital transformation as second. Companies are encouraged to file requests, and there are several individual projects based on that.
Resources needed	In 2019, 60 million NOK from national/regional funding, nearly the same amount from the municipalities were allocated. There are also contributions from suppliers. In Trøndelag County Council, two people are employed in the

	projects. And there are resources to involve controllers and legal advisers when needed.
Timescale (start/end date)	January 2008 – December 2025 (planned)
Evidence of success (results achieved)	In 2019, 3000 new fibre cable-based accesses to households and 15 new mobile cell towers for mobile networks (4G/5G and fixed radio) were built. Businesses in rural areas were given special priority. The success of getting these projects can be found in the cooperation-methodology model County Council/ municipalities/ telecom companies.
Potential for learning or transfer	Over a period of 15 years, Trøndelag has developed a model for cooperation that is seen as unique in the country. The model is based on the fact that there must be a fundamental trust and credibility between the actors, so that all work well together to achieve our goals. Openness, good communication and information are also key elements.
Website	https://www.interregeurope.eu/policylearning/good-practices/item/3836/development-of-digital-networks-fixed-and-mobile-in-non-commercially-viable-areas/

TABLE 5. GOOD PRACTICE "GUADALINFO - A SOCIAL NETWORK OF INHABITANTS IN ANDALUSIA"

Good practice general information	
Title of the good practice	*Guadalinfo - a social network of inhabitants in Andalusia*
Category of the good practice	*Please choose one of the categories:* █ *Awareness rising and collaboration;* █ *Empowering tools;* █ *Sustainability instruments;* █ *Enabling environment;* ☐ *Other*
Organisation in charge of the good practice	Consorcio Fernando de los Rios (Andalusia)
Description	
Short summary of the practice	Guadalinfo's focus is to empower people (using ICTs as a tool) to be the driving force behind the transformation of their communities: training adapted to different ages and profiles in digital competences, entrepreneurship skills, technological and professional skills, and community awareness and cohesion, with special attention to the prevention of digital, gender and social gaps. - Guadalinfo shows the opportunities that the use of ICTs offers by carrying out activities for entrepreneurs, SMEs and the community in general. - Some activities are dedicated to SMEs, which aim to

	develop entrepreneurial capacities and increase self-esteem as vital assets for adapting to change. Courses of digitalization literacy, strategies of communication, digital contents generation, blogs managing, security, marketing for selling their products, or digital marketing. All of them are courses that equip entrepreneurs with the skills they need to operate in a digital market in a global world. - Guadalinfo also works to increase the value of website creation by SMEs, that can experience the benefits of trading online meanwhile raise their profile and value. - The project has 826 physical locations all over the Andalusia´s region that SMEs can visit and receive support from. - Guadalinfo is aimed at different ages and groups to train digital skills, to improve professional and entrepreneurial skills, promoting the digital transformation of SMEs.
Resources needed	*The budget for Guadalinfo is about EUR 19,3 million. Guadalinfo has about 800 centres rooted in Andalusia with 800 Local Innovation Agents.* *All the activities promoted by Guadalinfo (both in person or on line) are free for users registered in its platform.*
Timescale (start/end date)	*January 2001 – ongoing*
Evidence of success (results achieved)	Guadalinfo developed 70.000 activities in 2017, 90.000 in 2018 and 100.000 in 2019. About 10.000 entrepreneurs and 5.000 SMEs participated in one or more activities related to digital transformation in 2019. Guadalinfo has more than 1 million users registered into its platform. Andalusia has improved in IT literacy, benefiting in particular people, entrepreneurs and SMEs in rural areas and those with traditionally more difficulties in accessing ICTs. 53% of the users are women.
Potential for learning or transfer	During the development years of the Guadalinfo project, the Government of Andalusia received numerous expressions of interest from the other Spanish regions and countries due to the high transferability of the project at national and international level. In particular, there has already been an exchange of experience with Bolivia, Brazil and Romania and several relationships have been developed with the other Spanish Autonomous Communities. In terms of good practice for developing the Information Society, Andalusia's Ministry of Innovation particularly points out its choice to pursue a strategy based on free software as a way of combating the limitations caused by property software. The advances achieved in providing citizens with training resources, providing SMES tools for digital transformation and the development of a model encouraging cooperation between local bodies can be considered a point of reference for other initiatives with the same aims.

Website	https://www.interregeurope.eu/policylearning/good-practices/item/4002/guadalinfo-a-social-network-of-inhabitants-in-andalusia/

TABLE 6. GOOD PRACTICE "BUSINESS SPACE"

Good practice general information	
Title of the good practice	***Business Space (Espaço Empresa)***
Category of the good practice	*Please choose one of the categories:* ■ *Awareness rising and collaboration;* ■ *Empowering tools;* ☐ *Sustainability instruments;* ☐ *Enabling environment;* ☐ *Other*
Organisation in charge of the good practice	Municipality of Paços de Ferreira, Tamega and Sousa
Description	
Short summary of the practice	The "Business Space" service was designed to support entrepreneurs in the creation and management of their businesses, under a logic of a single point of contact between the government and the SMEs. This initiative was a response of the Portuguese government to the need to have a specific space where SME entrepreneurs could solve any issues related to their businesses. SME entrepreneurs and start-ups can receive timely information, advice and support adjusted to their needs. The entrepreneurs have at their disposal a broad range of digital services and a mediated service for licensing processes. Overall, the provided services are information, support (legal and economical) and advice for SME companies; intermediation and facilitation (interface with Central Public Administration services); and assisted digital services, which support the provision of online services provided by the public administration. As far as the digital field is concerned, the ePortugal portal provides specific space for the "Business area" services, which includes informative content supporting business and investment; electronic services for the fulfilment of legal formalities (related with the creation and incorporation of companies and economic activities licensing); and application forms for submitting requests for both meeting scheduling and online information.
Resources needed	About 2,000 €/month for equipment and human resources (1.5 full time equivalent person). This cost is supported by the Municipality of Paços de Ferreira.
Timescale (start/end date)	April 2017 – ongoing

Evidence of success (results achieved)	In total, this initiative has so far assisted more than 700 people.
Potential for learning or transfer	The Business Space service is strongly oriented to customers with specific needs to create a small company and/or to solve problems directly related to their small or medium businesses. Being assisted by specialised staff, help can be provided in an easy way. On one hand, SMEs meet someone to whom the situation can be explained and, on the other, they can address the problem immediately through digital services. Key success factors are the availability of specialised staff, concentration in just one place of different services provided by various public entities, and digital services available for free. This practice can easily be transferred and implemented to address a wide range of situations, preventing people from visiting a high number of places to create their business or to solve a problem. All the actors involved have benefits, the public services increase efficiency, and the customers save money and time!
Website	https://www.interregeurope.eu/policylearning/good-practices/item/3924/espaco-empresa-business-space/

TABLE 7. GOOD PRACTICE "GRANADA EMPRESAS"

Good practice general information	
Title of the good practice	*GRANADA EMPRESAS: a Web Platform of advisory support services for entrepreneurs in a rural area*
Category of the good practice	*Please choose one of the categories:* ▮ *Awareness rising and collaboration;* ▮ *Empowering tools;* ▮ *Sustainability instruments;* ▮ *Enabling environment;* ☐ *Other*
Organisation in charge of the good practice	*County Council of Granada*
Description	
Short summary of the practice	This Service of Enterprises provides to each City Hall a Web Platform which can be linked to the City Hall web, in order to allow the access and utilisation of tools and resources to assist technically all stages of creation and consolidation of new companies. This technology platform offers two possibilities to City Halls in relation to the way that Granada County Council can provide them technical assistance: either it is provided directly to entrepreneurs and enterprises, or it is directed to the staff designated by the entity for assisting business projects in their territory.

Resources needed	Economic resources: A total investment is estimated in the platform since 2010 of 100.000 €, including the platform's design and programming, various extensions, modifications and renewals thereof as well as all resources and content including: tools, guides, etc.
Timescale (start/end date)	September 2010 –ongoing
Evidence of success (results achieved)	www.granadaempresas.es which was launched in September 2010, has more than 6.000 users registered and 3037 business projects (2.316 business ideas and 604 enterprises). The Granada Empresas community on social networks (Facebook fans, Twitter followers, Linkedin contacts) represents 12.500 users. Currently the staff of the provincial Council of Granada has advised in a customized manner to more than 600 business projects through the platform. And the platform has exceeded 1.900.000 page views.
Potential for learning or transfer	Innovative elements: the innovation of this initiative is due to, on the one hand, by the process, because there is no other web platform that offers many services and tools such as those offered by www.granadaempresas.es and, on the other hand, by the context because the platform sets a new system of work in a network among entrepreneurs, companies and municipalities of Granada which is a province with great territorial imbalances, geographical diversity and a rural character. - Sustainability of the initiative: the impact of the initiative and the great reception given among entrepreneurs and companies of Granada has facilitated the project, which was designed in the framework of a European project (Local and Urban Development Project with ERDF Funds of the 2007-2013 programming period) which has finished in December 2012 It has become one of the main activity provided from the provincial Service of Enterprises.
Website	https://www.interregeurope.eu/policylearning/good-practices/item/3287/granada-empresas-a-web-platform-of-advisory-support-services-for-entrepreneurs-in-a-rural-area/

TABLE 8. GOOD PRACTICE "ANDALUCÍA OPEN FUTURE (AOF)"

Good practice general information	
Title of the good practice	*Boosting Technology-Based Entrepreneurship: Andalucía Open Future (AOF)*
Category of the good practice	*Please choose one of the categories:* ■ *Awareness rising and collaboration;* ■ *Empowering tools;* ■ *Sustainability instruments;* ■ *Enabling environment;*

	☐ *Other*
Organisation in charge of the good practice	*Andalusia Regional Ministry of Economy, Knowledge, Enterprises and University*

Description	
Short summary of the practice	Andalucía Open Future and Minerva are 2 public-private collaboration initiatives of Andalucía government and Telefonica (AOF) and Vodafone (Minerva) offering equity-free acceleration programs for tech companies based in: * Mentorship & support * Networking * Market-fit * Access to customers These initiatives intend to promote technology-based entrepreneurship in Andalusia region by the means of acceleration programmes especially oriented to companies developing technological solutions, mainly small start-ups. AOF operates through a network of "Spaces of Crowdworking" with 4 centers in Andalusia, aiming to become knowledge & innovation centers where entrepreneurs can find a working environment and an open innovation space, enabling them to efficiently develop and accelerate their technological entrepreneurial projects. AOF program opens 2 calls/ year with 20-30 projects selected. This acceleration programme lasts between 4-8 months.
Resources needed	The resources needed each year: Managing Team: AOF 380K€ Spaces: AOF 200K Operative costs: AOF 72K€ Mentorship: AOF 180K€ PR & Media: AOF 180K€
Timescale (start/end date)	*June 2014 – ongoing*
Evidence of success (results achieved)	These initiatives facilitate the development of projects, technology, products and services of companies and startups, in areas such as agrotechnology, agrifood, etc. • + than 220 startups accelerated. +80% in business activity • +80 Mentors specialized in finance, communication and digital marketing, legal aspects, sales, internationalisation. • + than 40 investors back up the initiative
Potential for learning or transfer	These initiatives facilitate the development of projects, technology, products and services of companies and startups, in areas such as agrotechnology, agrifood, etc. More than 220 startups accelerated. +80% in business activity. Both AOF and Minerva have marked a turning point in the regional ecosystem. Both covered a gap detected in 2014 that was the absence of accelerators, and both have supported the most important startups of the region. Now, Andalusia is a potential startup ecosystem in Spain by the

	consequence of these programs. The role of the public sector is the creation a favourable environment for the development of companies. The role of the private sector is the generation of business and the creation of employment. If we join both efforts, we can obtain a powerful lever for new ventures and startups.
Website	https://www.interregeurope.eu/policylearning/good-practices/item/3551/boosting-technology-based-entrepreneurship-andalucia-open-future-aof-and-minerva/

TABLE 9. GOOD PRACTICE "CONSULTANCY ON BUSINESS SUPPORT"

Good practice general information	
Title of the good practice	***Consultancy on business support (SMEs internationalisation through digital solutions)***
Category of the good practice	*Please choose one of the categories:* ■ *Awareness rising and collaboration;* ■ *Empowering tools;* ☐ *Sustainability instruments;* ☐ *Enabling environment;* ☐ *Other*
Organisation in charge of the good practice	Zemgale Region Human Resource and Competences Development Centre (ZRKAC), Latvia
Description	
Short summary of the practice	The main goal of this scheme is to provide individual mentoring and consulting support to SMEs (including home-based workers) to establish a visual identity on the Internet and create a visually appealing product design, carry out the promotion of SMEs products in external markets (e.g. through trading platforms such as etsy.com) and ensure that SMEs websites are easily accessible to potential clients. Participating SMEs are expected to significantly enhance their product brand identification both locally and abroad, while increasing sales and turnover.
Resources needed	Consulting services are free of charge and are provided by two employees covered by the municipality budget. ZRKAC events for collective training are organised in cooperation with some partners (e.g., British Council, Social Business Association, social entrepreneurs, etc.)
Timescale (start/end date)	January 2009 – ongoing
Evidence of success (results achieved)	So far as many as 5,668 consulting services have been provided. It started with 143 consultations in 2009; in 2019 reached 1120. Regarding SMEs direct benefits: **1)** 28 SMEs improved e-commerce and increased product turnover (20–

	50%); **2)** 7 workshops (68 SMEs) about online tools; **3)** 48 SMEs created promotional campaigns and visual identity for their products using online tools; **4)** 5 seminars on digital marketing (43 participants); **5)** Zemgale Region Enterprise Catalogue (137 enterprises, 1982 categories, also about 50 deals concluded and 20 partnerships established).
Potential for learning or transfer	This is an easy tool to set up in order to support business development in areas with low population density, including individual consultations, workshops, seminars, match-making activities, projects, regular communication, support for the creation of new products (e.g., Minox, Minisociton, etc.).
Website	https://www.interregeurope.eu/policylearning/good-practices/item/4093/consultancy-on-business-support/

TABLE 10. GOOD PRACTICE "INDUSTRY 4.0 REFERENTIAL"

Good practice general information	
Title of the good practice	**Industry 4.0 Referential**
Category of the good practice	*Please choose one of the categories:* ☐ *Awareness rising and collaboration;* ■ *Empowering tools;* ☐ *Sustainability instruments;* ☐ *Enabling environment;* ☐ *Other*
Organisation in charge of the good practice	National Operational Programme for Competitiveness and Internationalisation (COMPETE 2020) - Managing Authority, Portugal
Description	
Short summary of the practice	Referentials for the assessment of Industry 4.0 relevance in the context of investment projects, regarding particularly project selection (e.g., increase or decrease rating, incentive amounts etc) are very useful for the managing authorities in charge of digitalisation support programmes. Such referentials are essential to evaluate whether projects include (or not) relevant investments in i4.0. As this is a relatively new concept for SMEs and for those who evaluate the applications, the Portuguese managing authority of the ERDF national operational programme for competitiveness and internationalisation felt that some guidance was needed. In the application, SMEs explain what technologies already they use and how they will invest through the project in three main areas: **1)** Information systems (digital infrastructure, artificial intelligence and predictive algorithms, data analysis, cloud computing, cybersecurity); **2)** Connectivity between systems, equipment, products and people (sensors and IoT, remote operation, increased reality, intelligent machines); **3)** Advanced production systems (connected products and materials, operations, additive production, autonomous robots). Adjustments were made as some experience was acquired, being the most relevant the demand of a

	direct link to the expenses, which in turn helps SMEs to explain and the evaluator better understand the required investments. With the application, a given project is evaluated as a whole and specifically assessed regarding relevant investments in Industry 4.0. If positively assessed, the project would have higher score and, in some cases, also a higher incentive tax. This methodology helps SMEs to focus more on Industry 4.0, guides them to fill in the application, and allows the evaluators to have the relevant information structured and linked to the investments.
Resources needed	Human resources from the COMPETE 2020 managing authority, with the support from COTEC Portugal - Business Association for Innovation, and IAPMEI - National Agency for Competitiveness and Innovation
Timescale (start/end date)	2017 – ongoing
Evidence of success (results achieved)	This methodology was already used in 13 calls for proposals encompassing more than 5,800 applications since 2017 and has allowed SMEs to better realise what are the more relevant goals in i4.0, as well as evaluators to understand whether applicants are taking the appropriate steps for i4.0. All this information allows also to have strong data on the relevance of i4.0 investments, type of companies, types of technologies, etc.
Potential for learning or transfer	It's a simple methodology that starts with the identification of relevant technologies in Industry 4.0, making it easy to adapt to any country, region, sector, or programme. The referential can be used under specific support for i4.0 investments only, or to identify i4.0 relevance in innovation, qualification, or training investment projects. With the submission of applications and their evaluations, huge amount of data can be extracted about the type of SMEs (e.g., dimension, sector, region) and how they they are making their way to i4.0. (e.g., technologies, investments, etc.).
Website	https://www.interregeurope.eu/policylearning/good-practices/item/5347/industry-4-0-referential/

TABLE 11. GOOD PRACTICE "MASTER IN DIGITAL AGRICULTURE AND AGRI-FOOD INNOVATION"

Good practice general information	
Title of the good practice	*Master's Degree in Digital Agriculture and Agri-Food Innovation at University of Sevilla*
Category of the good practice	*Please choose one of the categories:* ■ *Awareness rising and collaboration;* ■ *Empowering tools;* ■ *Sustainability instruments;* ■ *Enabling environment;* ☐ *Other*
Organisation in charge of the good practice	University of Seville

Description	
Short summary of the practice	This master focuses on the advancement of digital and precision agriculture to generate an educational model based on technological innovation in agriculture. The commitment to food sustainability, accessibility, and traceability in the agri-food chain is key to this master's degree, and the students involved learn most of the techniques and technologies that make them possible. The combination of on-site practical lectures with optional internships in ag-tech companies offers to the students the necessary skills to implement and lead digitalization and agricultural innovation projects. This master's degree aims to foster students' ability to discover and implement new business models, inspire their entrepreneurial spirits and stimulate the creation of a science-technology-business ecosystem. The School of Agricultural Engineers of the University of Seville launched this program to form professionals capable of combining conventional agronomic knowledge with cutting-edge technologies, a highly demanded figure nowadays.
Resources needed	The Master's degree is financed through the enrollment of students and also has the sponsorship of companies in the agri-food sector that actively support this initiative by providing materials and devices, knowledge and offering scholarships and paid internships for students.
Timescale (start/end date)	May 2018 – ongoing
Evidence of success (results achieved)	One of the main focuses of the Master in Digital Agriculture and Agrifood Innovation is the transfer of knowledge and cutting-edge technologies that are not widely adopted yet in the agricultural sector. But perhaps the greatest proof of success of this programme is the visibility that students are achieving; companies in the sector are approaching it in search for talent to incorporate into their teams. In this sense, several students are having the opportunity to show their skills in some of thes
Potential for learning or transfer	It is clear that there is an interest in the agri-food sector to incorporate technologies from other areas that will improve its profitability and viability. There is also an important demand for these new professional profiles in the employment context. It would be very interesting to launch initiatives like this from other areas, both public and private, to contribute to the development of new solutions and proposals based on the use of technology for the optimization of productive resources. The transfer of knowledge, in an educational program is a very relevant indicator. But even more so is finding a ROI for the technicians in the master's degree, a motivation to adopt sustainable and profitable systems. The learning program seeks to emphasize the use of technologies, but even more so their economic potential as drivers of the sector, seeking to

	convert companies that bet on digital, in the market shapers that are needed in the industry.
Website	https://www.interregeurope.eu/policylearning/good-practices/item/3566/master-s-degree-in-digital-agriculture-and-agri-food-innovation-at-university-of-sevilla/

9 Findings and conclusions

In a region with tradition in manufacturing industries and relevant oil and gas production, which in recent years (before the pandemic crisis) has shown economic dynamism in sectors such as tourism, trade, services and agriculture, the interactions established within the regional innovation ecosystem have progressively increase, mainly through projects that bring closer together some of the main stakeholders, being the most striking example the regional smart specialisation strategy (RIS3) with the various focus groups working around technological and economic areas in which the region is willing to excel nationally and internationally. There has been positive evolution in business innovation expenditure regarding certain indicators (e.g., non-R&D innovation expenditure and product/process innovation), and the role of the university has been progressively noticed through the carried-out R&D activities and growing number of young people holding a university degree who reach the labour market every year.

On the topic of digital transformation, there has been gradual expansion of the broadband infrastructure that allows fast internet connectivity, which is covering more and more territory and population. There is evidence of progressive digitalisation of SMEs, including digital technologies, processes and business models. Several regional successful initiatives can be identified to foster digital transition in SMEs, such as the Digital Innovation Hub, Punto Impresa Digitale and Growing in Digital.

There is significant public support for digital transformation at regional level, being of particular relevance the Regional Operational Programme 2014-2020 funded by the ERDF, which provides a wide range of action lines and instruments for SMEs to innovate and digitalise. Basilicata's SMEs have also the possibility of obtaining financing (including access to credit) through national programmes also funded by the ERDF.

The next few years will bring excellent opportunities for small and micro firms in Basilicata to be increasingly innovative and digital. The new Regional Operational Programme 2021-2027 is to reinforce public funding for RTD, innovation and digitalisation activities, while the Italian Recovery and Resilience Plan points out digitalisation as a key priority for investment, including digital infrastructure and public services, which will also benefit SMEs as end-users.

On the other hand, even before the epidemic broke out, the region also experienced a slight decline in population in recent years, a small decline in GDP per capita since 2019, and a small rise in unemployment also since 2019.

It is known that the local economy is less competitive when compared to northern regions of the country, as well as the difficulties that Basilicata's businesses experience in accessing larger markets in Italy and abroad. An old issue related to the transport infrastructure (including roads, railways and aviation), which is relatively limited and has not evolved much over the years, worsens the competitive capacity of the region.

Basilicata ranks a modest position in the EU Regional Innovation Scoreboard, although it has improved in the last years. Some of the shortcomings of the regional innovation system include relatively low business expenditure in R&D, scarce cooperation between companies and the scientific and technological system and, in general despite recent improvements, still low regular cooperation between the main stakeholders (e.g., university, research centres,

business associations, clusters, companies, entrepreneurs etc) for innovation activities, including low collaboration among businesses.

There appears to be a fragmentation of RTD activities into multiple projects with rather limited critical mass. Stable collaboration (e.g., public-private partnerships) based on regional specialisations have not been identified. In fact, interactions within the innovation system tend not to be continuous, representing almost always isolated experiences. Existing cooperation between companies, for instance belonging to the same sectors or clusters, seem to seek mainly commercial purposes, not looking for joint cooperation to develop innovative production processes based on advanced technologies that could give rise to high added-value products.

Low propensity of Lucanian companies to participate in national networks of technological specialisation was also noted, as well as in European innovation networks, including modest participation in calls for proposals under programmes such as Horizon 2020/Horizon Europe.

An issue widely noticed during the work of desk research and field research was the difficulty in maintaining qualified young people in the region. Although coordination between the university and the labour market could be more effective to resolve the mismatch between graduates' profiles and companies' needs, such problem of brain drain has evidently much deeper reasons that have to do with the fact the region not being attractive enough for young people to carry out their professional careers.

As far as the challenges of digitalisation are concerned, Basilicata should focus on accelerating the expansion of the high internet connectivity infrastructure throughout the whole territory, thus alleviating the disadvantage that it means today for SMEs to be located in rural areas. Furthermore, issues such as low digital skills in SMEs leading to scarce adoption of digital technologies, scarce digital literacy among small business owners and limited capacity of SMEs to engage ICT experts (in-house or external) have been identified, particularly in the so-called traditional economic sectors where family businesses still have significant weight.

10 Recommendations for the Hosting Partner

Basilicata faces the challenge of improving economic competitiveness and becoming a more innovative region. Investment in scientific excellence, regular interaction between the research and business communities, promotion of high-tech entrepreneurship and attraction of foreign investment seem to be some of the long-term solutions that could contribute to attain such overarching objectives. Greater internationalisation of its companies and organisations and attraction of talent must also be a goal for the region. Recommendations for future actions include:

- Investing in scientific excellence, namely in higher education and specific RTD areas where the region can stand out in the country and abroad, increasing the region's chances to be internationally recognised as an innovative region.
- Making science-business cooperation more regular through ongoing multilateral projects involving SMEs, large companies (including multinational), entities of the scientific and technological system, business associations and clusters.
- Fostering technology- and knowledge-based entrepreneurship, so that innovative firms can bring new products, technologies and business models, increasing Basilicata's innovation and competitiveness, while retaining and attracting talent.
- Attracting Foreign Direct Investment (FDI) and repositioning the region into global value chains, which can be achieved through a mix of efficient logistical networks, qualified human resources, highly reputable university, and international recognised research centres, placing Basilicata on the radar of multinational companies.

While there are other relevant regional and national programmes to support the digital transition of Lucanian SMEs, the main public policy instrument in this field is the Regional Operational Programme (ROP) 2014-2020 funded by the European Regional Development Fund (ERDF). The programme offers a rather diversified and complete set of actions to support local SMEs and is in line with the typologies of support delivered by similar operational programmes in other European regions. Bearing in mind the characteristics of the region and its main challenges, the following recommendations are suggested to make the operational programme more effective in increasing SMEs competitiveness and digitalisation, for instance under the next ROP 2021-2027:

- Discriminating positively micro companies in accessing funding for innovation and digitalisation, including specific calls for proposals only for micro and small companies, and particularly for those located in rural areas. The management of these calls could be decentralised in rural territories, being entrusted to groups of municipalities or other entities at sub-regional level.
- Funding regional or sub-regional networks for digital transformation of micro and small companies, made up of public and private entities on the supply and demand sides of digital support services. This should be accompanied by a better understanding of the needs of Basilicata's small firms in terms of type of digital transformation needed and type of support required.
- Prioritising support for wide collective projects involving various actors of the regional innovation system (region, university, RTD/innovation support centres, business associations, clusters, digital service providers) to the detriment of one-to-one projects in which a SME works with only one service provider. In addition to faster diffusion of new knowledge and new technologies, this would also help to streamline the innovation ecosystem and combat the lack of a cooperation culture.

– Enhancing the coordination between the ERDF ROP and ESF ROP, in order to improve training actions and the development of digital skills in small companies within broader innovation investment projects.

In order to speed up SMEs digital transformation, a set of actions is recommended so that faster and more effective developments can be achieved in the region:
– Identify the actors in Basilicata who are potential providers as well as beneficiaries of knowledge and technologies, so as to create a collaborative and integrated digital innovation ecosystem.
– Launch physical and virtual technology marketplaces for digital innovation. Intermediaries such as clusters, business associations or ICT companies, which are offering digital products and solutions to the market, could facilitate the creation of such physical and virtual technology marketplaces that use digital innovation as a service, and assist small firms in the transition of their business models towards new paradigms.
– Overcome financial barriers to digital transition, paying particular attention to micro and small enterprises. Vouchers and grants, which have been the most common instruments used to support SMEs, should continue to be made available to small businesses under the next cycle of ERDF support.
– Address rural-urban digital divide through better understanding of the needs of Basilicata's rural SMEs in terms of digital transformation required and support needed. Specific measures for small and micro businesses could be considered with support from ERDF and ESF funding.
– Signpost digital support available in the region, including the development of a directory of providers of digital support, as well as a single information portal, which could gather on just one portal or website information related to digitalisation and ICT services, such as training, e-commerce, internet connectivity, cybersecurity, etc.
– Boost e-commerce in SMEs (through for instance cooperation with third-party e-commerce companies) and digital payment processes, allowing small enterprises to increase sales and exports.
– Accelerate the digitalisation of the public sector, which will raise awareness among public employees and end users (businesses and citizens) on the potential of digital solutions, hence producing a pull effect for digital transformation on the whole society.

With regard to capacity building and digital upskilling and reskilling, the following suggestions are provided in view of an overall development of digital skills in the region:
– Accelerating the expansion of ultra-broadband infrastructure and 5G technology to enable ultra-fast internet connectivity.
– Reinforcing the profile of University of Basilicata as an entity of scientific excellence in education and research in ICT, increasing the number of researchers, graduates and post-graduates in this field. Financial incentives could be provided to the university to create new university diplomas in emerging areas, thus increasing the number of students in courses with high demand.
– Attracting ICT highly skilled talent through the reinforcement of scholarship systems for international students, including PhD students and researchers.
– Strengthening teaching in STEM areas in order to develop, retain and attract digital skills. Endeavours should be made in order to introduce digital and programming skills since education first level and make more attractive further studies in secondary and higher education levels in STEM areas.

– Launching new training centres in ICT that support companies (particularly SMEs) in upskilling and reskilling their human resources, so they can have a good command of digital technologies applied to production, management and sales processes. In particular, the improvement of digital skills of small business entrepreneurs should be attained. Within such activities, the use of e-Learning platforms could be encouraged.
– Implementing campaigns of digital literacy and digital skills development for the population at large. Such actions could engage unemployed people, elderly population and children, so as to increase their proficiency in topics such as Office tools, cybersecurity, internet for beginners, computer programming, web page development and management, etc.

It is also recommended to Basilicata that rather than implementing isolated measures to create better conditions for small businesses to embark in successful digital transformation, the region could consider launching an integrated strategy for digitalisation, aligned with key regional development, innovation and specialisation priorities, participated by key stakeholders across different economic sectors and the scientific/technological system, built around a shared and inspiring vision, and led by a suitable governance structure.

Finally, the region is recommended to develop benchmarking exercises on an ongoing basis, comparing policies, instruments, performance metrics and best practices with other Italian and European regions, in particular in what concerns to digital transformation of regional economies. This will enable Basilicata to timely develop action plans on how to make improvements in the region and adapt specific best practices.

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Useful websites:

- https://digital-strategy.ec.europa.eu/en/policies/desi
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Annexes

- Agenda of PR event.
- Presentation delivered by the PR experts during the PR event.
- Video/audio recordings.