



European Union
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SKILLS+
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SKILLS+

**Promoting knowledge capacity in
ICT among SME to engage in
growth and innovation**

JOINT STUDY



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INTRODUCTION

The study on the application of digital technologies for the promotion of SME's development has been undertaken in the framework of the SKILLS+ project. (<https://www.interregeurope.eu/skillsplus/>)

The SKILLS+ overall objective is to enhance the competitiveness of SMEs in rural areas through the promotion of the uptake and integration of modern ICT tools in daily business routines.

The project started on April 2016 and its first phase will end on March 2019. The second phase of the project, which will start immediately after the first phase, will last until the end of March 2021.

This study analyses situations in 11 SKILLS+ partner regions/countries:

1. SOFIA, YUGOZAPADEN REGION, BULGARIA
2. OSTRAVA, MORAVSKOSLEZSKO REGION, CZECH REPUBLIC
3. SACHSEN ANHALT REGION, GERMANY
4. WESTERN MACEDONIA (DYTIKI MAKEDONIA) REGION, VOREIA ELLADA, GREECE
5. CASTILLA Y LEON REGION, SPAIN
6. ZADAR, JADRANSKA HRVATSKA REGION, CROATIA
7. REPUBLIC OF LATVIA
8. PANNON NOVUM WEST-TRANSDANUBIA, NYGAT-DUNANTUL REGION, HUNGARY
9. MALOPOLSKIE, POLUDNIEOWY REGION, POLAND
10. KAINUU, POHJOIS-JA ITA SUOMI REGION, FINLAND
11. SØR TRØNDELAG, TRØNDELAG REGION, NORWAY

Taking into account data shortages on NUTS3 level in the Eurostat databases, most of the cases used NUTS2 level data throughout this study.

The project partner regions include around 13 million inhabitants and a total size of all concerned territories of around 317 square kilometres.

The objective of the Joint Report is to provide a comparative analysis of the Single Digital Market (SDM) developments in the SKILLS+ partner regions as well as to identify main problems and opportunities for promoting development of SMEs through ICT.

The Joint Report is prepared by the SKILLS+ Advisory Partner, the University of Latvia Centre for European and Transition Studies, based on the research and results of the SKILLS+ partner's Baseline Studies which provide a comparative analysis, general overview of SKILLS+ countries and regions, as well as define main drawbacks and opportunities for digitalisation of the economy. The Joint Report has been read and approved by each of the SKILLS+ partner institutions.

The research work involves analysing quantitative and qualitative data, literature and policy documents, as well as SWOT analysis. Qualitative data have been gathered by more than 70 expert interviews in partner countries and regions.

Based on the research and peer reviews undertaken during the second half of 2017, the measures defined during the first phase of the project will be reflected in the Action Plans to be implemented during the second phase of the project. The Action Plans will be elaborated together with regional stakeholders, as well as endorsed and formally approved by legally competent decision makers.

According to the Project Application Form, the following policy instruments will be tackled by the Action Plans created by the project partnership:

Table 1. Policy instruments addressed by the SKILLS+ project partners.

No	Partner region	Policy instrument(s) tackled
1.	SOFIA, YUGOZAPADEN REGION, BULGARIA	Policy implemented through Operational Programme "Innovations and Competitiveness" Priority Axis 2: Entrepreneurship and Capacity for Growth of SMEs
2.	OSTRAVA, MORAVSKOSLEZSKO REGION, CZECH REPUBLIC	Operational Programme Enterprise and Innovations for Competitiveness, Priority Axis 1: Development of research and development for innovations; Specific Objective 1.2: Increase of intensity and effectiveness of cooperation in research, development and innovations
3.	SACHSEN ANHALT REGION, GERMANY	ERDF OP SaxonyAnhalt 2014-2020, Investment Priority 1b; Strategic Objective 2: Strengthening innovation capacities of the economy in the RIS-defined lead markets
4.	WESTERN MACEDONIA (DYTIKI MAKEDONIA) REGION, VOREIA ELLADA, GREECE	Axis 2 Investment Priority 2c – Enhancement of ICT applications in e-government, e-learning, e-inclusion, e-culture and e-health
5.	CASTILLA Y LEON REGION, SPAIN	ERDF OP 2014-2020 for Castilla y León, Thematic objective 2: Improve access, quality and use of ICT; Specific Objective 2.3.2: strengthening ICT applications for e-government, e-culture and confidence in the digital environment
6.	ZADAR, JADRANSKA HRVATSKA REGION, CROATIA	OP Competitiveness and Cohesion 2014-2020, Priority Axis 3: Business Competitiveness; Investment priority 3d: Supporting the capacity of SME to grow [...], Specific Objective 3d1: SME's development and growth improved in domestic and foreign markets
7.	REPUBLIC OF LATVIA	Operational Programme „Growth and Employment 20142020” Thematic objective (2): Enhancing access to and use and quality of ICT, 1.) Developing ICT products, ICT services and ecommerce, as well as to increase the demand in the ICT sphere
8.	PANNON NOVUM WEST- TRANSDANUBIA, NYGAT-DUNANTUL REGION, HUNGARY	Economic Development and Innovation Operational Programme for Hungary, Priority axis: Infocommunication developments
9.	MALOPOLSKIE, POLUDNIEOWY REGION, POLAND	Regional Innovation Strategy, Priority axis 2 "Creation of demand for innovation"
10.	KAINUU, POHJOIS- JA ITA SUOMI REGION, FINLAND	Sustainable growth and jobs 2014-2020, Finland's structural funds programme, TL 1 Competitiveness of SMEs (ERDF) Investment Priority 2. Support for SMEs so that they can grow through regional, national and international markets [...], Specific Objective 2.1 To support [...] SMEs
11.	SØR TRØNDELAG, TRØNDELAG REGION, NORWAY	eTrøndelag strategy

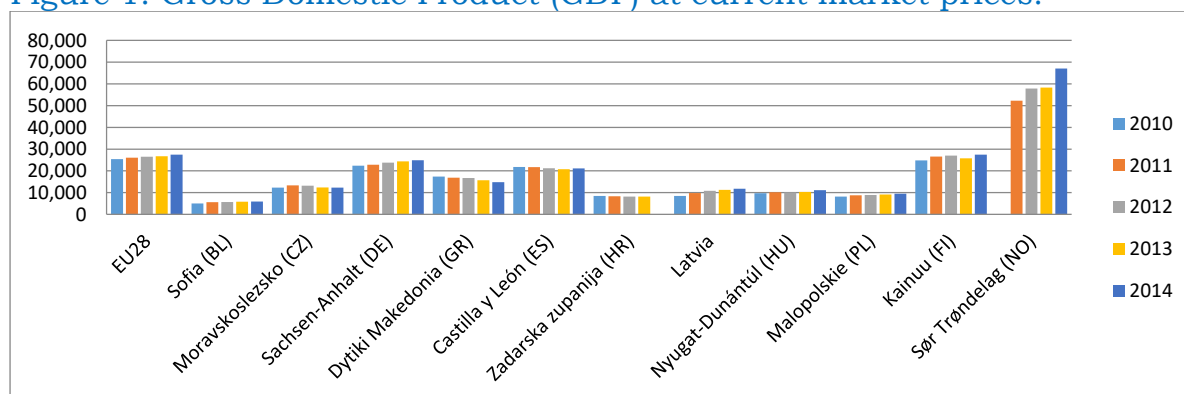
Source: SKILLS+ project Application form.

GENERAL OVERVIEW AND MAIN CHALLENGES

1.1. GENERAL OVERVIEW OF THE ECONOMIC SITUATION

The economic development and welfare situation in each SKILLS+ project region are quite different. While GDP per capita in Sør Trøndelag is almost 2.5 times above the EU-28 average, the rest of the partners, except Kainuu, for this indicator in 2014 was still below the EU-28 average. (See Figure 1)

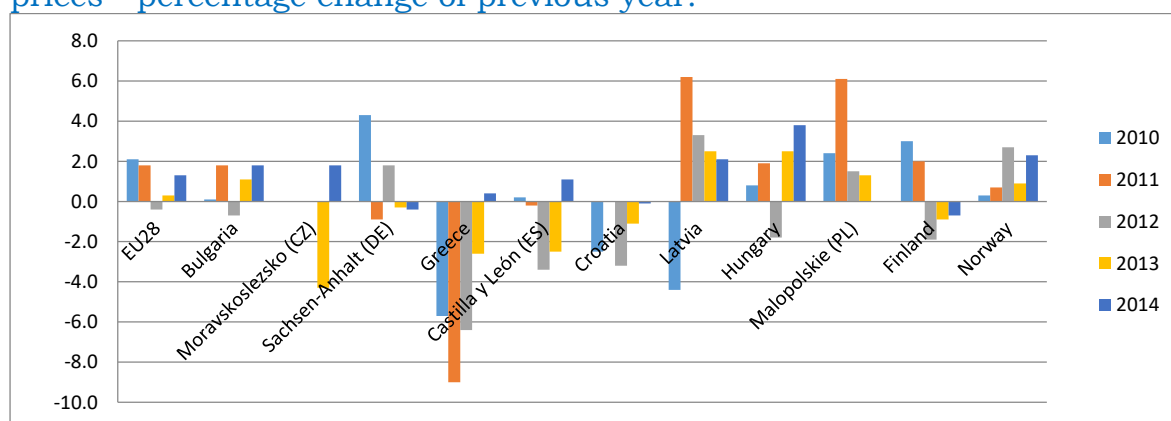
Figure 1. Gross Domestic Product (GDP) at current market prices.



Source: Eurostat

Regional GDP growth rates (2010-2015) have been improving since 2010, even in the case of partners that were slightly negative – even -9.0% (2011) for Greece. Despite strong growth shown by some regions (Latvia, Malopolskie, Sachsen-Anhalt), it is still moderate in the case of most SKILLS+ partners. In 2014, the GDP growth rate exceeding the EU-28 level (1.3%) was achieved by Bulgaria (1.8%), Moravskoslezsko, Poland (1.8), Latvia (2.1), Hungary (3.8) and Norway (2.8). (See Figure 2)

Figure 2. Real growth rate of regional gross value added (GVA) at basic prices - percentage change of previous year.¹



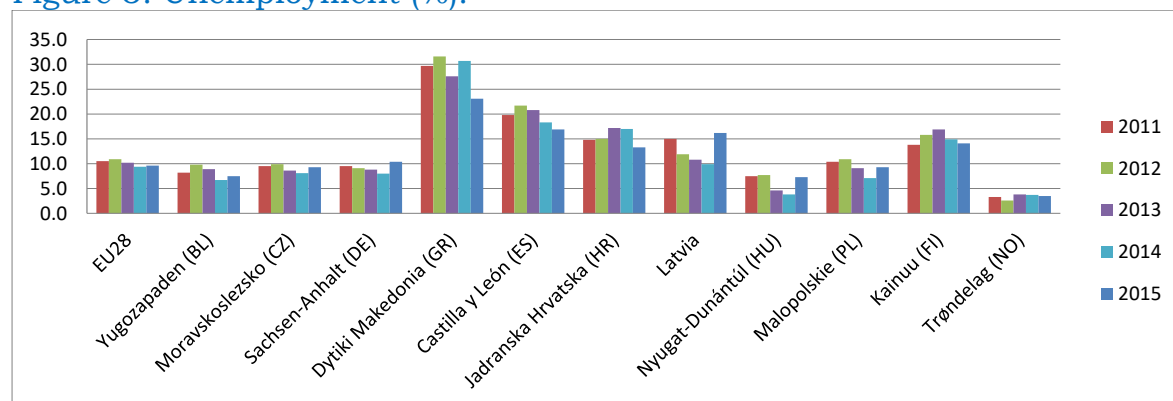
Source: Eurostat

While the unemployment rate in SKILLS+ partner regions has been gradually declining, for most of partners, it was still above the EU-28 average in 2015: Dytiki Makedonia, Greece (30.7%), Castilla y

¹ Data is reflected according to the availability of data on the Eurostat data bases. In most of cases, the data for this indicator is available on the country level only.

León (18.3%), Jadranska Hrvatska, Croatia (17.0), Latvia (9.9%) and Pohjois-ja Itä-Suomi, Finland (10.4%). The lowest unemployment rate in 2015 was in Trøndelag, Norway (3.7%) and Nyugat-Dunántúl, Hungary (3.8%).

Figure 3. Unemployment (%).



Sources: Eurostat, Ministry of Economics of Finland (Maakuntien suhdannekehitys 2012 - 2014, TEM analyysseja 56/2014)

1.2. THE ICT SECTOR DEVELOPMENT AND MAIN POLICY CHALLENGES IN SKILLS+ PARTNER REGIONS

The [Digital Single Market \(DSM\)](#) strategy was adopted on 6 May 2015. It includes 16 specific initiatives which were delivered by the European Commission until January 2017. The purpose of DSM is to create opportunities for new start-ups and allow existing companies in a market of over 500 million people. Completing a Digital Single Market could contribute € 415 billion per year to Europe's economy, create jobs and transform our public services. Completion of the DSM is one of the European Commission's political priorities.

In 2016, the EU progressed and improved its digital performance by 3 percentage points compared to the previous year (2015); however, progress could be faster. Also, the picture varies across Member States where the digital gap between the most and least digitalised countries is 37 percentage points, compared to 36 percentage points in 2014. The EU countries - Denmark, **Finland**, Sweden and the Netherlands, and **Norway** outside of the EU - lead the DESI² in 2017 followed by Luxembourg, Belgium, the UK, Ireland, Estonia, and Austria. The top three EU digital players (Denmark, Finland, Sweden) are also the global leaders, ahead of South Korea, Japan and the United States. Slovakia and Slovenia are the EU countries which have progressed the most. Despite some improvements, several Member States including **Poland**, **Croatia**, Italy, Greece, **Bulgaria** and Romania, are still lagging behind in their digital development compared to the EU average.³

The Digital Economy and Society Index (DESI) shows that⁴:

1. Connectivity improved, but is still insufficient to address future needs.
2. The EU has more digital specialists than before, but skills gaps remain.
3. Europeans are becoming more digital.
4. Businesses are more digital while e-commerce is growing but slowly.
5. Europeans use more public services online.

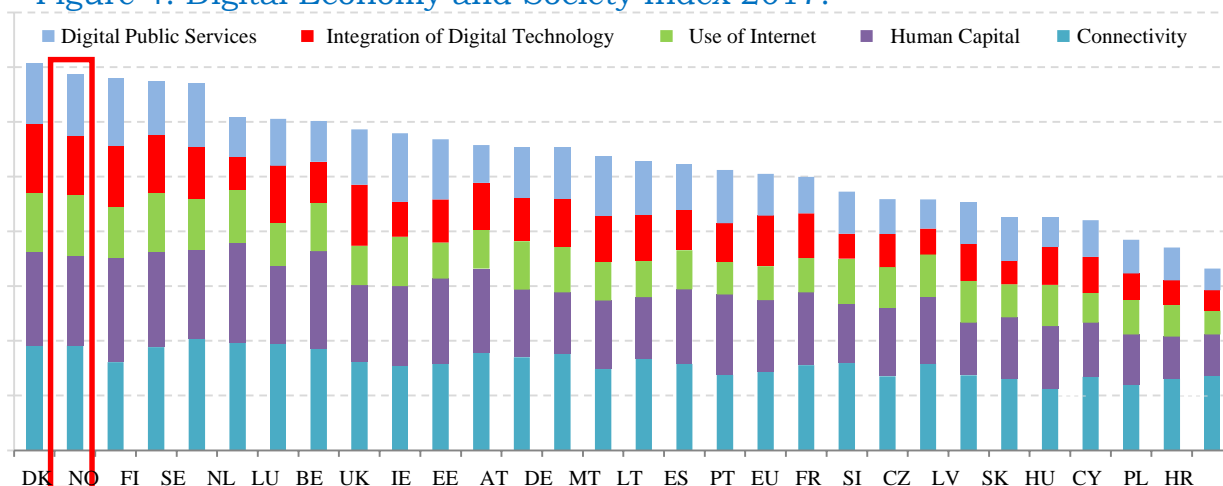
² The Digital Economy and Society Index (DESI) is a composite index that summarises relevant indicators (~30) on Europe's digital performance and tracks the evolution of EU member states in digital competitiveness, across five main dimensions: Connectivity, Human Capital, Use of Internet, Integration of Digital Technology, Digital Public Services.

³ European Commission, Digital Scoreboard

⁴ European Commission, Digital Scoreboard

From the SKILLS+ project perspective, four partner countries – Norway, Finland, Germany and Spain - are above the EU average with Norway and Finland leading the way. The remaining seven countries represented by the SKILLS+ partnership still need to improve their digital performance. There are a lot of challenges ahead before the digital gap can be reduced. (See Figure 4).

Figure 4. Digital Economy and Society Index 2017.



Source: European Commission, Digital Scoreboard

Table 2. Strengths and weaknesses of SKILLS+ countries.

COUNTRY	DESI 2017	STRENGTHS	WEAKNESSES
BULGARIA	27	Improved broadband infrastructure and open data developments	Digital skills, digitisation of businesses and of public services
CROATIA	24	Citizens are above-average users of the Internet; improving digital skills; use of digital technologies by enterprises – close to average; improving Digital Public Services	Low performance in Connectivity
CZECH REPUBLIC	18	Progressed in Digital Public Services; stable in Human Capital; Best performer in Integration of Digital Technologies by Businesses	Low use of Internet services, in particular for e-Government, entertainment and social purposes
FINLAND	2	One of the most digital countries worldwide; particular strength in digital skills where it is ahead of all other Member States; very strong in Digital Public Services	
GERMANY	11	Leader in spectrum assignment; above average-users of the Internet; progressing digital skills; active approach to the opportunities of e-Commerce	Reluctant to subscribe to fast broadband; only 19% e-Government users; low online interaction between public authorities and citizens

GREECE	26	More actively using Internet for video calls and online content	Low performance in digital skills
HUNGARY	21	Performs well on Connectivity, thanks to the wide availability of fast fixed broadband (NGA) and 4G as well as to the increasing broadband take-up; improved digital skills	Low use of ICTs by enterprises and the development of Digital Public Services
LATVIA	19	Increasing shares of fast broadband subscriptions ; improved delivery of public services online; increased use of e-Government services	Half of the population has low or no digital skills; increased online shopping but businesses are exploiting technologies in a limited way
NORWAY ⁵		Among the most digital countries; high broadband connectivity, Internet use, business digitisation and digital public services; above average on digital skills	
POLAND	23	Progress in Human Capital, Use of Internet and Connectivity; improved fast internet take-up, use of mobile broadband and assignment of spectrum for mobile broadband	Adoption of digital technologies by businesses and the development of digital public services
SPAIN	14	Good performance in the use of digital technologies by enterprises and in the delivery of online public services (above EU average). Particularly strong progress in connectivity, in terms of subscriptions to fast broadband and NGA coverage is also high	Human capital

Source: European Commission: <https://ec.europa.eu/digital-single-market/en/progress-country>

For the first time in 2017, the IMD World Competitiveness Centre has published a separate report ranking countries' digital competitiveness. The new Digital Competitiveness Ranking introduces several new criteria to measure countries' ability to adopt and explore digital technologies leading to transformation in government practices, business models and society in general.

The IMD World Digital Competitiveness Ranking (WDCR) 2017 presents overall rankings for the 63 economies covered by the World Competitiveness Yearbook (WCY). The rankings are calculated on the basis of the 50 ranked criteria: 30 Hard and 20 Survey data. The countries are ranked from the most to the least digitally competitive and the results from the previous year's scoreboard (2016) are shown in brackets.⁶ Please see the results of the WDCR for SKILLS+ partner countries in Table 2.

The evaluation of Digital Competitiveness is based on three main factors: knowledge, technology, and future readiness. This is further divided into detailed elements under the following categories: talent, training & education, scientific concentration, regulatory framework, capital, technological, adaptive attitudes, business agility, and IT integration. For more detailed information, please see Table 3.

⁵ Thought not the EU member, Norway is part of the EU digital single market, through the EEA Agreement and, therefore included in the ranking.

⁶ https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

Table 3. Overall structure of Digital Competitiveness.

Knowledge		
<i>Talent</i>	<i>Training and education</i>	<i>Scientific concentration</i>
Educational assessment PISA – Math International experience Foreign highly-skilled personnel Digital/Technological skills Net flow of international students	Employee training Total public expenditure on education Higher education achievement Pupil-teacher ratio [tertiary education] Graduates in Sciences Women with degrees	Total expenditure on R&D [%] Total R&D personnel per capita Female researchers R&D productivity by publication Scientific and technical employment High-tech patent grants
Technology		
<i>Regulatory framework</i>	<i>Capital</i>	<i>Technological</i>
Starting a business Enforcing contracts Immigration laws Technological regulation Scientific research legislation Intellectual property rights	IT & media stock market capitalization Funding for technology development Banking and financial services Investment risk Venture capital Investment in telecommunications	Communications technology Mobile broadband subscribers Wireless broadband Internet users Internet bandwidth speed High-tech exports [%]
Future readiness		
<i>Adaptive attitudes</i>	<i>Business agility</i>	<i>IT integration</i>
E-participation Internet retailing Tablet possession Attitudes toward globalisation	Opportunities and threats Innovative firms Agility of companies Use of big data and analytics Knowledge transfer	E-government Public-private partnerships Cybersecurity Software piracy

Source: https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

Table 4. SKILLS+ countries world digital competitiveness ranking 2017.

Country/ Ranking	WDCR 2017 ⁷	Talent	Training education	Scientific concent- ration	Regula- tory frame- work	Capital	Technolo- gical	Adaptive attitudes	Business agility	IT integra- tion
Bulgaria	45 (47)	51	39	30	50	46	34	47	61	55
Croatia	48 (44)	59	41	35	52	52	40	43	62	46
Czech Republic	32 (32)	26	49	34	43	15	15	42	33	33
Finland	4 (6)	10	8	12	2	10	8	3	17	2
Germany	17 (15)	16	15	15	20	19	26	22	18	16
Greece	50 (45)	47	55	33	49	58	49	41	53	48
Hungary	44 (42)	46	43	46	29	44	45	57	58	38
Latvia	35 (33)	29	20	47	34	31	24	46	41	36
Norway	10 (9)	20	12	22	3	7	3	8	20	14
Poland	37 (38)	28	23	40	47	32	39	38	45	41
Spain	30 (30)	32	42	29	35	34	23	24	47	26

Source: https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

According to the WDCR, Finland is the most Digitally Competitive country among the SKILLS+ partner countries and it performs the best in areas of talent, training & education, scientific concentration, regulatory framework, adaptive attitudes, business agility, and IT integration. At the same time, Norway is the leading country in the areas of capital and technological.

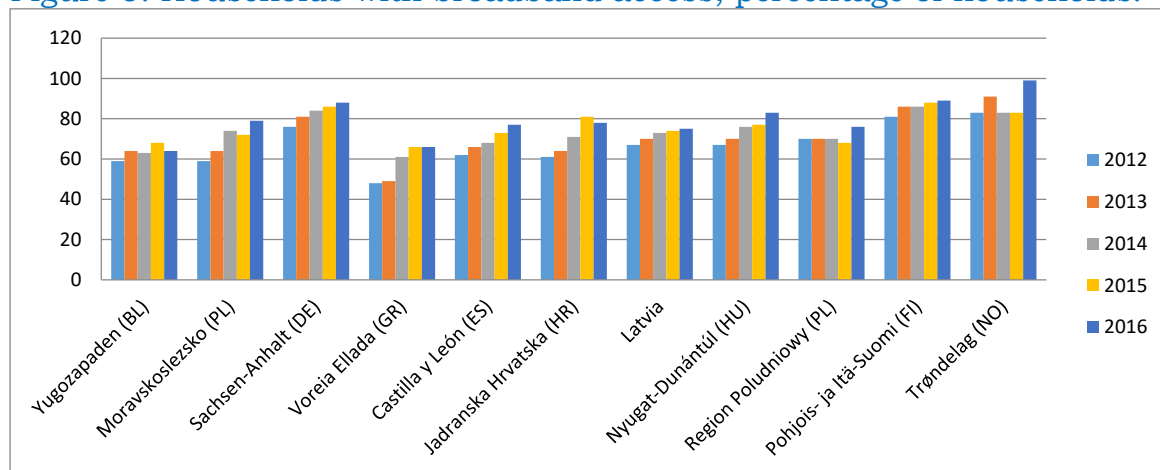
⁷ WDCR for 2016 in brackets

1.3. GENERAL CONTEXT CHARACTERIZED BY THE DIGITAL SINGLE MARKET INDICATORS.

Similarly, in terms of macroeconomic development, DSM indicators, and ICT development, the situation in SKILLS+ partner countries is quite diverse.

During the last 4 years (2012-2016) the **household access to broadband** has gradually increased reaching almost 100% in a case of Trøndelag, Norway (99%) in 2016. The lowest indicators in terms of broadband access in 2016 were in the cases of Yugožapaden, Bulgaria (64%) and Voreia Ellada (66%). (see Figure 5)

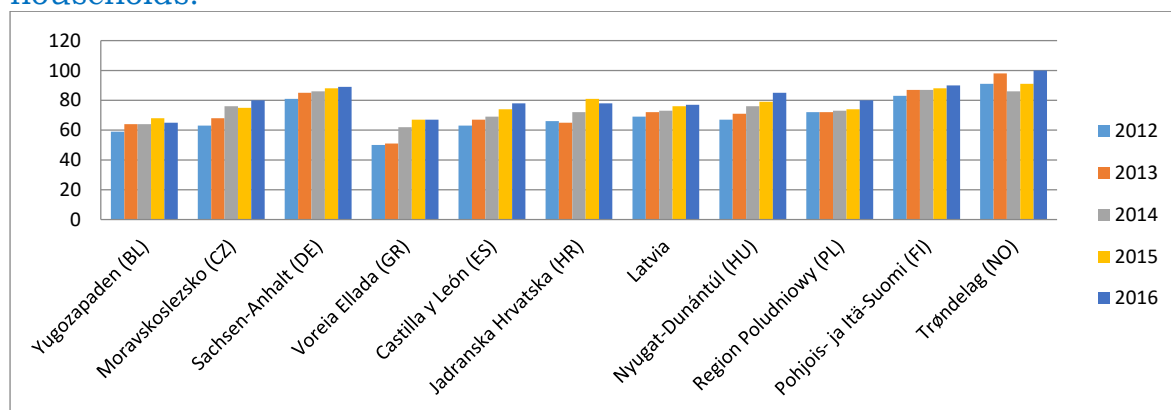
Figure 5. Households with broadband access, percentage of households.



Source: Eurostat

Almost full **households' access to internet at home** was achieved by 2016, reaching 100% in the case of Trøndelag, Norway, 90% in case of Pohjois- ja Itä-Suomi, Finland and 89% in case of Sachsen-Anhalt. In cases of other partners, it varies from 65% - 85%. (See Figure 6)

Figure 6. Households with access to the internet at home, percentage of households.



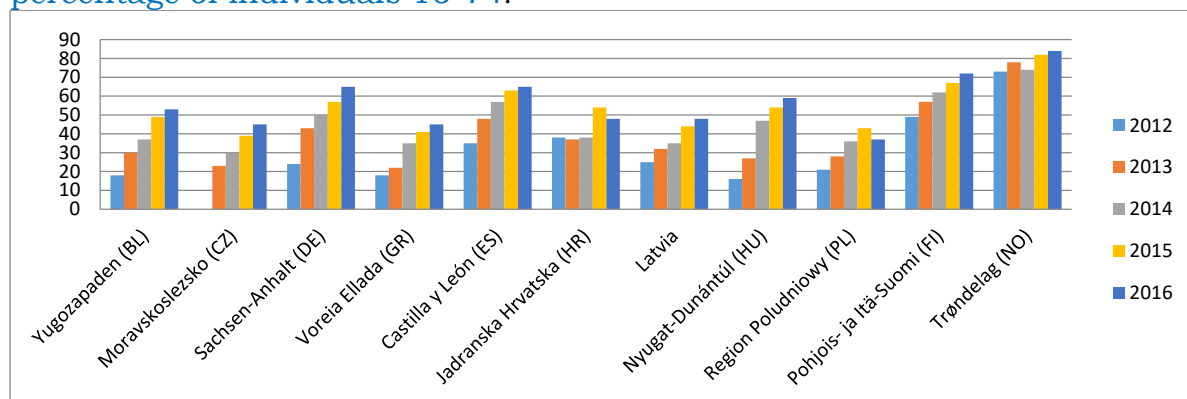
Source: Eurostat.

Both tables, measuring household access to broadband and household access to internet at home are showing very similar trends, indicating that access to broadband has been very important for growing percentage of households with access to internet at home.

At the same time, share of **individuals who accessed the internet away from home or work** in 2016 was above 50% for only in the cases of six SKILLS+ partner regions: Sachsen-Anhalt, Germany

(65%); Castilla y León (65%); Yugozapaden, Bulgaria (53%); Nyugat-Dunántúl, Hungary (59%); Pohjois- ja Itä-Suomi, Finland (72%); and Trøndelag, Norway (84%). (See Figure 7)

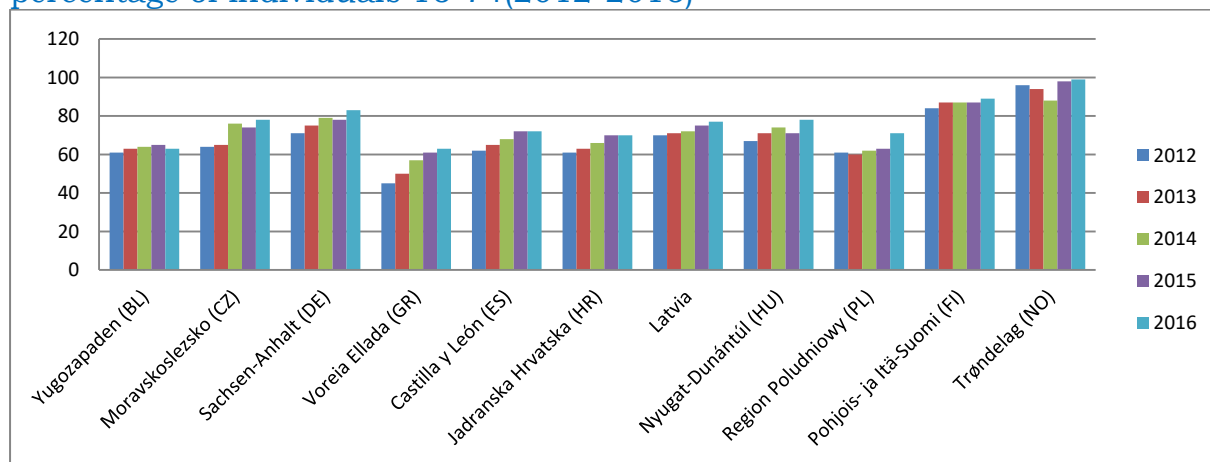
Figure 7. Individuals who accessed the internet away from home or work, percentage of individuals 16-74.



Source: Eurostat.

With greater accessibility, also the **frequency of internet access** has been gradually increasing. Not surprisingly, leaders in this category in 2016 were Trøndelag, Norway and Pohjois- ja Itä-Suomi, Finland with 99% and 89%, respectively. Users were accessing the Internet at least once a week, including those who are accessing internet on a daily basis. At the same time, only 63% of the population in Yugozapaden, Bulgaria and Voreia Ellada, Greece were accessing the Internet at least once a week in 2016. (see Figure 8)

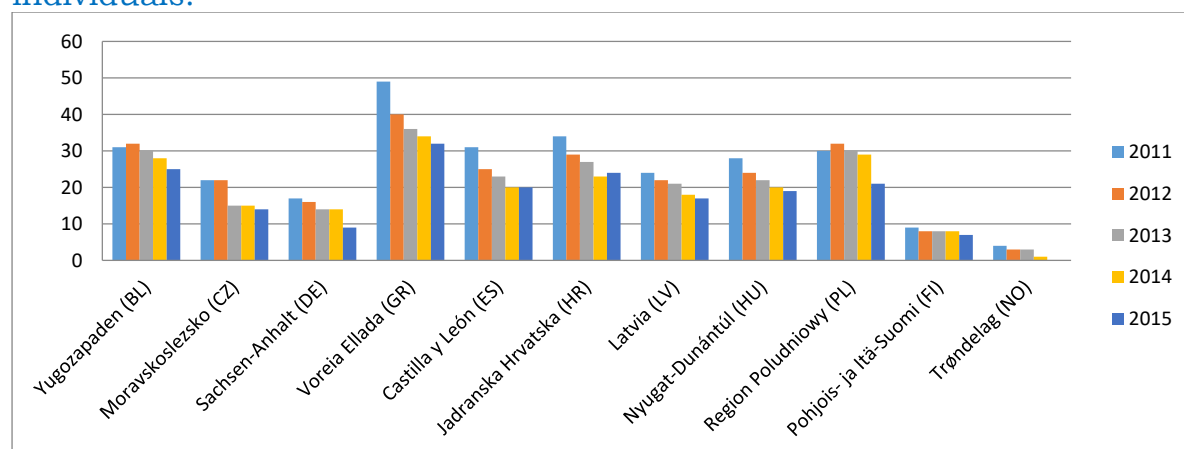
Figure 8. Frequency of internet access: once a week (including every day), percentage of individuals 16-74(2012-2016)



Source: Eurostat.

In 2015, there were still quite many **individuals who had never used a computer**. In the case of Trøndelag, Norway the computer was used by 100% of population (16 to 74 years) in 2015. In Pohjois- ja Itä-Suomi, Finland only 7% and 9% in Sachsen-Anhalt, Germany had never used a computer as of 2015. At the same time in Voreia Ellada, Greece, 32% of the population had never used a computer according to the Eurostat data of the year 2015. (See Figure 9.)

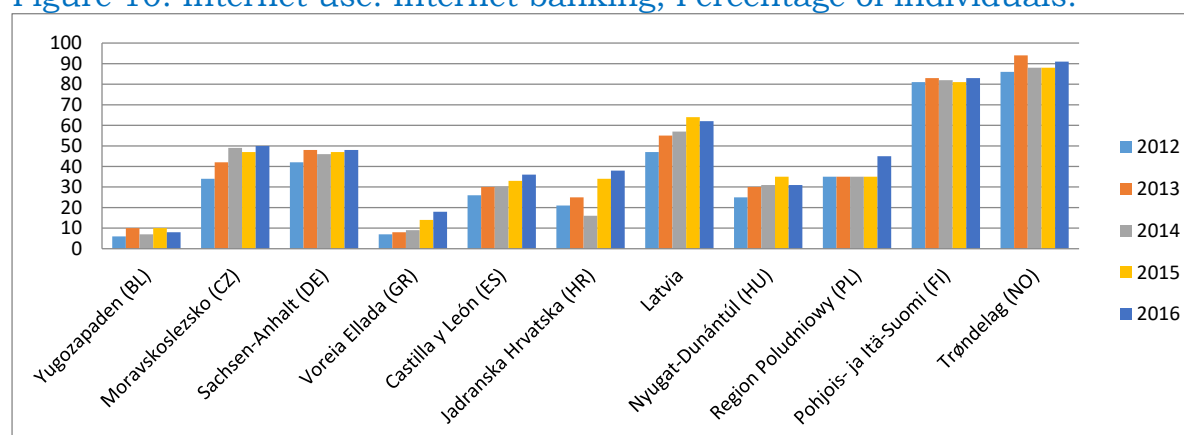
Figure 9. Individuals who have never used a computer, percentage of individuals.



Source: Eurostat.

The share of people using **internet banking** is also gradually increasing, reaching 91% and 83% by 2016 in cases of Trøndelag, Norway and Pohjois- ja Itä-Suomi, Finland, respectively. However in some regions, the use of internet banking is critically low: only 8% of individuals use internet banking in Yugo Zapaden, Bulgaria and only 18% in Voreia Ellada, Greece. (See Figure 10.)

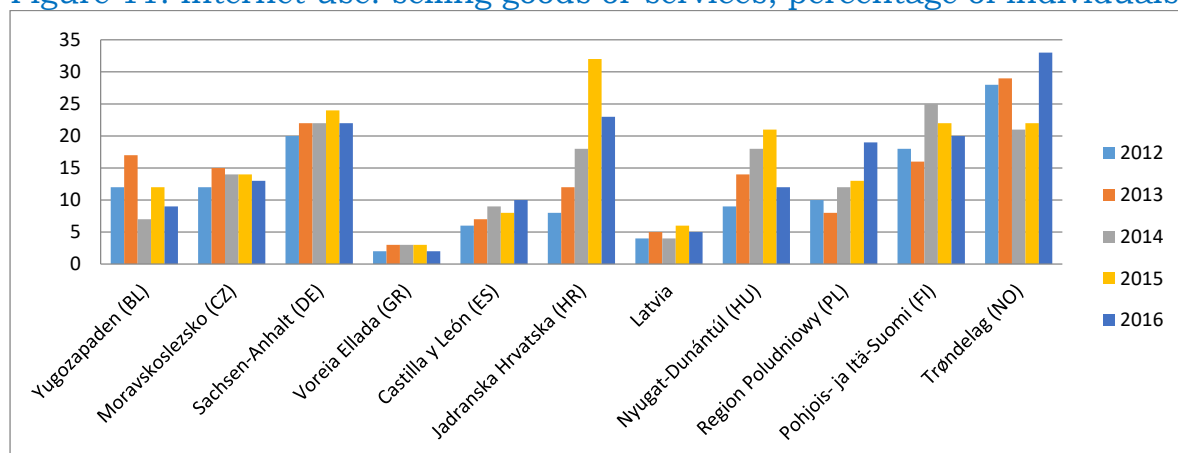
Figure 10. Internet use: Internet banking, Percentage of individuals.



Source: Eurostat.

Using internet for selling goods or services was still comparatively low by 2016 in all SKILLS+ partners regions. The greatest share of users belongs to Trøndelag, Norway (33%). For several countries this indicator is very low: Yugo Zapaden, Bulgaria (9%); Latvia (5%) and Voreia Ellada, Greece (2%). This indicator could be partly related to the low use of internet banking in cases of Bulgaria and Greece, except for Latvia where internet banking is quite widely used (62%, 2016). It should be noted that the increase of this indicator over the four years period (2012-2016) has been very slow and volatile. (See Figure 11)

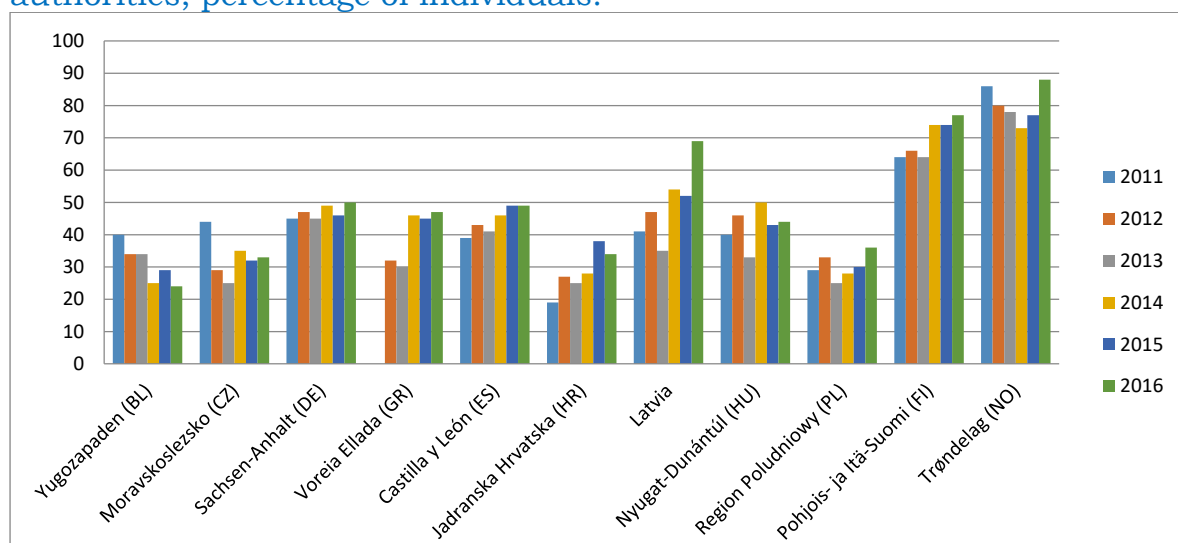
Figure 11. Internet use: selling goods or services, percentage of individuals.



Source: Eurostat.

Good results for **using internet for interaction with public authorities** by 2016 were achieved by Trøndelag, Norway (88%), Pohjois- ja Itä-Suomi, Finland (77%) and Latvia (69%). In all other partner regions in 2016, shares were below 50%, falling down to only 24% in the case of Yugo Zapaden, Bulgaria. In cases of Yugo Zapaden, Bulgaria and Moravskoslezsko, Czech Republic, this indicator has been decreasing over the time period from 2012 to 2016. (see Figure 12.)

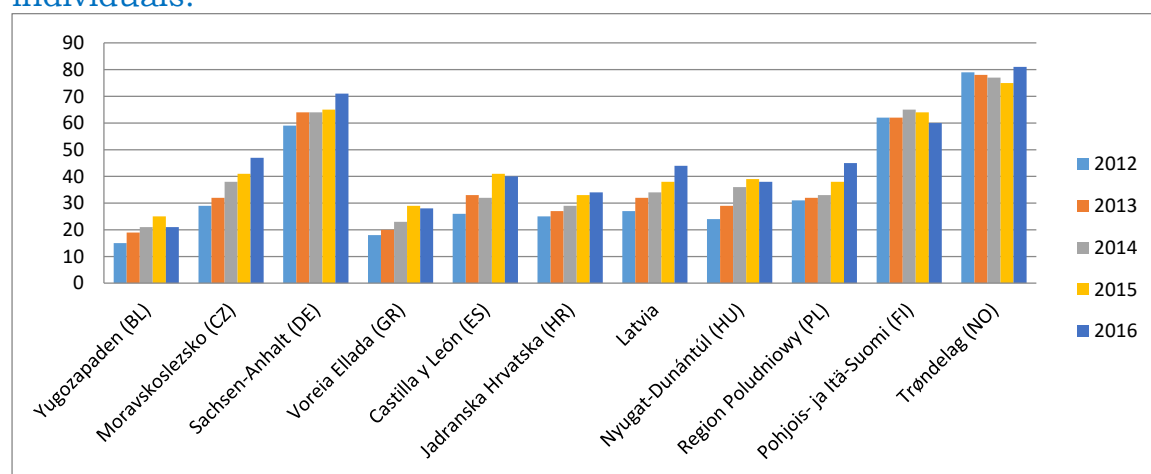
Figure 12. Individuals who used the internet for interaction with public authorities, percentage of individuals.



Source: Eurostat.

There are more **individuals, who ordered goods or services over the internet for private use** than those who are selling goods and services on the internet. Most people using the internet for purchases in 2016 were in Trøndelag, Norway (81%), Pohjois-ja Itä-Suomi, Finland (60%) and Sachsen-Anhalt, Germany (71%). In all other cases, shares of users were below 50%, falling down to 21% in the case of Yugo Zapaden, Bulgaria (2016). (See Figure 13)

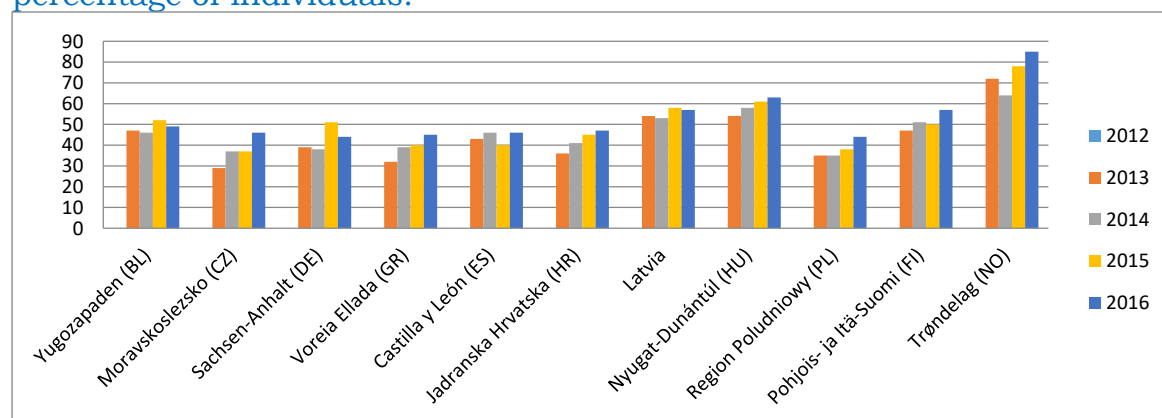
Figure 13. Individuals who ordered goods or services over the internet for private use, Last online purchase: in the 12 months, percentage of individuals.



Source: Eurostat

Participation in social networks is gradually increasing in all partner regions. The most active users of social networks in 2016 were in Trøndelag, Norway (85%), Nyugat-Dunántúl, Hungary (63%) Pohjois- ja Itä-Suomi, Finland (57%) and Latvia (57%). In all other partners' regions shares of users were below 50%. In the case of Sachsen-Anhalt, Germany this indicator has fallen from 51% in 2015 to 44% in 2016. (Please, see Figure 14.)

Figure 14. Internet use: participating in social networks (creating user profile, posting messages or other contributions to Facebook, Twitter, etc.), percentage of individuals.



Source: Eurostat

1.4. COMMON CHALLENGES FACED BY SKILLS+ PARTNER REGIONS AND BUSINESSES⁸

Despite differences in macroeconomic and ICT development across the SKILLS+ partner regions, there are also common features for all the partners which are reflected by the SWOT analysis conducted by

⁸ Analysis is based on information provided by SKILLS+ partners in their Baseline Studies.

the SKILLS+ partners. The SWOT analysis also confirms the findings of statistical analysis presented above. (See full descriptions of SKILLS+ partners SWOT analysis in the Appendix 2.)

Identified **STRENGTHS**, which are common for all SKILLS+ partners are the following:

- ✚ Good access to broadband internet and developed infrastructure, except rural and areas difficult to access
- ✚ Gradually increasing share of population using computers, other devices and Internet
- ✚ Gradually increasing computer literacy, e-skills development and use of Internet by SMEs
- ✚ Low costs for Internet services
- ✚ Strong development of digital competences across the entire framework of education
- ✚ Accessibility to EU, public or regional (Norway) funds for the ICT development

There are WEAKNESSES identified by SKILLS+ partners:

- ✚ Uneven broadband coverage (regional imbalances) with low penetration of broadband access in remote, sparsely populated, difficult to access (mountains) and rural areas
- ✚ Slow growth and volatile development of online sales and purchases
- ✚ Lack of digital skills, high-level specialists and competences even in the most digitally advanced regions
- ✚ Businesses aren't taking full advantages of opportunities provided by the ICT and Internet; lack of relations between production and digitalisation
- ✚ Aging societies with low or no digital knowledge, competences and ICT skills
- ✚ Absence of a strong government level leadership supporting ICT development and digitalisation on all levels.

There are numerous common **OPPORTUNITIES** for the SKILLS+ partners. Among those the most important are:

- ✚ Using broadband connections and access to the Internet in most public areas; getting easier and cheaper access to new technologies, tools and competences
- ✚ Using EU and other public and regional funds to continue to develop infrastructure, technologies, e-government and services
- ✚ Facilitating businesses development and improving living conditions also outside of cities
- ✚ Developing new innovative digital products and ideas, using new technologies for exploiting new chances
- ✚ Using the digital change in market as a chance: work more flexibly and efficiently, develop lively corporate culture and flexible working teams, increase customer satisfaction, develop digital communication and interaction with customers, evaluate customer behaviour through digital market and shops, increase individual offers and use more friendly way of communication etc.
- ✚ Producing more ICT experts and skilled workers, facilitating foreign investment and development of new ICT related research centres.

There are also particular common **THREATS** identified by SKILLS+ partners:

- ✚ Digital "exclusion" of remote, sparsely populated and rural areas, and socially disadvantaged people
- ✚ Lost markets and advantages if SMEs will not be able to compete on local and international levels due to the lack of ICT skills, digital knowledge and ability to adapt to rapidly changing technologies and business environment
- ✚ IT security and digital economy related threats, i.e. cyber security
- ✚ Demographic changes, i.e. aging society, shortage of skills, competences and high level ICT specialists ('brain drain' in some cases)
- ✚ Too complex ICT-related regulatory framework, difficult to use e-government services with complicated digital certification systems in the presence of a rapid technological change.

2. REGIONAL/COUNTRY DIGITAL PROFILES

2.1. YUGOZAPADEN, SOFIA, BULGARIA⁹

The Sofia District is included in the South West (Yugozapaden) planning region of Bulgaria. It doesn't include the capital city of Sofia, which is also a part of the Yugozapaden Region. The Yugozapaden Region borders with Serbia, Macedonia, Greece and it encompasses some parts of the Western Balkans. The Yugozapaden Region is the richest one in Bulgaria and produces almost half of the country's GDP.

Territory: Yugozapaden – 20 040.0 km²; Sofia District - 7059 km²
Population: Yugozapaden – 2.12 million (2016); Sofia District - 237 080 (2015)
GDP per capita (PPS per inhabitant; % of the EU28 average, NUTS2): EUR 22 000; 76% (2015)
Percentage of the ICT sector from GDP, % - n/a
Total R&D expenditure (GERD, NUTS2, % of GDP): 1.39 (2014)
Unemployment rate (NUTS2, %): 5.4 (2016)
Percentage of workforce working in the ICT sector, % - n/a

According to the DESI 2017 results, Bulgaria ranks the 27th among the EU member states. Compared to the previous year, Bulgaria progressed in the enhancement of its broadband infrastructure and in open data developments. However, its low performance in digital skills, digitisation of businesses and public services are acting as a brake for the further development of Bulgaria's digital economy and society.¹⁰

According to the World Digital Competitiveness Ranking 2017¹¹, Bulgaria ranks the 45th among 63 countries. The weakest performance is in the areas of business agility¹² (61) and IT integration¹³ (55).

According to the SKILLS+ partner report, Bulgaria also has uneven broadband coverage. Concerning the penetration of broadband access, Bulgaria has one of the lowest rankings in the EU, with only 19%, mostly due to the lack of access to the Internet in remote, sparsely populated and rural areas. Despite the fact that 90% of Bulgarians have access to the Internet, the difference between regions is significant. Less than 60% of the rural population have access to this service, which also slows down business development in these areas. Also, e-Government services aren't provided equally in all regions of Bulgaria. Since 2012, Bulgaria has a Single Electronic Communications Network of the State Administration and the Needs of National Security (SECNSANNS) that provides connectivity for voice, data and video sharing between the central government and local authorities in the regional cities and is the main e-Government infrastructure. However, most of the local authorities aren't connected to this infrastructure and use alternative Internet providers. Low digital literacy of the population is another obstacle for the low use of computers and the Internet. Enterprises use the Internet and e-Government services more actively than citizens; however, enterprises and their staff need more skills and knowledge for an efficient ICT uptake.

The main factors behind the development of ICT in Bulgaria are:

- the presence of the IT multinational corporations, which helps ICT businesses easily access top-notch technologies at affordable prices;
- Bulgaria has the second fastest broadband in the world after South Korea;

⁹ All demographic, economic, unemployment and R&D expenditure indicators are taken from the Eurostat Database Regional statistics (<http://ec.europa.eu/eurostat/data/database>) if not indicated otherwise. All ICT indicators are taken from Baseline Studies conducted by the SKILLS+ partners. The text is based on the information provided in the SKILLS+ partner's Baseline Study and author's own internet search.

¹⁰ <https://ec.europa.eu/digital-single-market/en/news/digital-economy-and-society-index-desi-2017>

¹¹ https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

¹² Opportunities and threats; Innovative firms; Agility of companies; Use of big data and analytics; Knowledge transfer.

¹³ E-government; public – private partnerships; cyber security; software piracy.

- Bulgaria is one of the leading countries with a high number of top Multinational ICT corporations in Eastern Europe, such as HP, SAP, Johnson Controls, VMware, CISCO, ProSyst, Atos and others.
- the average wage in the ICT sector in Bulgaria is lower than in other EU countries and, therefore, the sector is attractive for companies looking for outsourcing software services
- 2.7% of the total workforce works for the ICT sector. 3500 IT graduates are graduating Bulgarian universities every year.

The importance of the ICT development is stressed in the Innovation Strategy for Smart Specialization (S3). The ICT is a key driver for building a competitive economy based on knowledge and innovation having impact on both, social and economic sectors. The priorities of the Strategy¹⁴ are focused on the sustainable implementation of the ICT to ensure economic and social viability.

The Operational Programme “Innovation and Competitiveness 2014-2020” is considered as the most important support instrument in Bulgaria for the ICT uptake by SMEs and digitalisation, which provides access to financing.

The most important initiative for the ICT development and innovation in Bulgaria is the Sofia Tech Park JSC, which was founded in 2012 by the Ministry of Economy of Bulgaria. It has well developed research infrastructure to support Bulgarian innovative businesses, renovated building spaces for applied research laboratories, demonstration areas, etc. This is the first Science and Technology Park of Bulgaria, which is supported by the EU Cohesion funds.

Taking into account research results, **the main challenges of Bulgaria and the Sofia District for promoting digitalisation of SMEs are related to improving connectivity and accessibility of the Internet in rural areas, as well as performance in digital skills, digitisation of businesses and of public services.**

2.2. MORAVIAN-SILESIA REGION, OSTRAVA, THE CZECH REPUBLIC ¹⁵

The Moravian-Silesian (Moravskoslezsko) Region is situated in the North East of the Czech Republic with the capital city of Ostrava. It borders with neighbouring countries, Poland and Slovakia. The Region historically has been the center of coal mining and steel industries. Since 1990, the Moravian-Silesian Region has been undergoing structural changes with an objective to develop a modern, innovative, environmental-friendly open area.

Territory of Moravian-Silesian Region – 5 427 km Population of Moravian-Silesian Region – 1.2 million (2013) GDP per capita (PPS per inhabitant; % of the EU28 average, NUTS2): EUR 20 900; 72% (2015) Percentage of the ICT sector from GDP, % - 3.85, 2015 (national level, Czech Republic) Real growth rate (Gross Value Added, basic prices, NUTS2): 2.0 (2015) Total R&D expenditure (GERD, NUTS2, % of GDP): 1.26 (2014) Unemployment rate (NUTS2, %): 6.9 (2016) Percentage of workforce working in the ICT sector, % - 3.71 (national level, Czech Republic)

Most of the ICT data are available on the national level. Taking into account the regional data analysis conducted in Part 1.3, main DSM indicators are gradually improving. Still, the percentage of SMEs selling online is quite low and did not show a constant growing trend during the period 2012 to 2016.

¹⁴ <https://www.mi.government.bg/en/themes/innovation-strategy-for-smart-specialization-of-the-republic-of-bulgaria-2014-2020-is3-1470-287.html>

¹⁵ All demographic, economic, unemployment and R&D expenditure indicators are taken from the Eurostat Database Regional statistics (<http://ec.europa.eu/eurostat/data/database>) if not indicated otherwise. All ICT indicators are taken from Baseline Studies conducted by the SKILLS+ partners. The text is based on the information provided in the SKILLS+ partner's Baseline Study and author's own internet search.

According to the DESI index 2017, the Czech Republic ranks the 18th among the EU member states. Compared to 2016, the country progressed in Digital Public Services and remained stable in Human Capital, but worsened its ranking in other dimensions. The country performs best in Integration of Digital Technologies by Businesses, mostly because many SMEs embraced e-commerce. The country's greatest challenge in the digital sector is to improve the use of Internet services, in particular for e-Government, entertainment and social purposes.

The World Digital Competitiveness Ranking (2017) placed the Czech Republic 32nd among 63 countries. Main drawbacks are related to training & education¹⁶ (49), regulatory framework¹⁷ (43) and adaptive attitudes¹⁸ (42).¹⁹

In 2015, 98% of Czech companies were connected to the Internet. At the same time, over 90% of Czech companies used the Internet for banking and financial services. A percentage of enterprises having an internal cybersecurity policy (33% in 2015) corresponded to the EU average.

According to Eurostat²⁰, 93% of the Czech companies communicated with public authorities online in 2013, which exceeded the EU average and was a greater proportion than in cases of the UK (90%), Austria (91%), Croatia (92%), Poland (89%), Germany (81%), or Hungary (82%). Latvia (97%), Finland (98%), France (97%), Denmark (96%), Estonia (96%), Ireland and Sweden performed better than the Czech Republic.

In 2015, 83% of Czech businesses had their own website, which exceeded the EU average (75%)²¹. It was also higher than in the UK (80%), Italy (70%), Hungary (62%), Poland (63%), Spain (73%), Latvia (76%), and Ireland (73%). More businesses than in the Czech Republic with their own websites in 2015 can be found in cases of Finland (94%), Denmark (91%), Netherlands (90%), Sweden (90%), Germany (88%), and Austria (88%).

At the same time, the Czech Republic was among the top 5 EU countries with the highest share of online business orders. Eurostat data indicated countries where the turnover creates at least 1% of the total figure. The Czech Republic reached 5th place, the turnover percentage for e-commerce created a figure of 24% in 2015, while the EU average was only 17% at that time.

A share of basic digital capabilities measured per the whole population reached 33%, which was above the EU average²² of 27%. According to this rating, the Czech Republic was very high: the second place after Sweden (37%). The Czech companies launched web pages and provided facilities for online shopping; customers were skilled in using the Internet. While only 79% of households had an internet connection in 2015, the e-commerce in the Czech Republic was far above the EU average at the same time. It is interesting to note that 70% of households without an internet connection were not interested in having it²³.

Concerning social media, Czech companies fell slightly behind the EU average (39%); only 25% of businesses used these communication channels in 2015²⁴. Only Polish (21%) and Romanian (22%) companies used social media less than Czech companies (25%), while in other countries they seemed to be more popular. The highest percentages of companies using social media were located in Malta (71%), Ireland (63%), and the Netherlands (62%). The highest percentages of companies using social media in the Czech Republic are travel agencies, accommodation providers, and publishing houses.

¹⁶ Employee training; Total public expenditure on education; Higher education achievement; Pupil-teacher ratio (tertiary education); Graduates in science; Women with degrees.

¹⁷ Starting a business; Enforcing contracts; Immigration laws; Technological regulation; Scientific research legislation; Intellectual property rights.

¹⁸ E-participation; Internet retailing; Tablet possession; Smartphone possession; Attitudes toward globalization.

¹⁹ https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

²⁰ Eurostat. (August 5, 2017) *Enterprises using the internet for interacting with public authorities*. Statistical Dataset, Eurostat. Retrieved from http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_bde15ee&lang=en.

²¹ Eurostat, Websites and functionalities (2016)

²² EC - Digital Scorecard – digital agenda key indicators (2015)

²³ Eurostat, Households - reasons for not having internet access at home (2016) and Czech Statistical Authority (2016)

²⁴ Eurostat, Social media use by type, ads, on the internet (2016)

Advanced data analysis software (such as CRM), was used by only 17% of Czech enterprises, which was 4% less than the EU average in 2015²⁵. This ranks the Czech Republic among the last third of the EU countries. High purchase costs and subsequent flat-rate payments for software were mentioned as the main reasons that the Czech Republic lagged behind the EU.

The ICT development is one of focus areas in RIS3 for the Czech Republic. The preparation of a new version of the National ICT Development Plan is still in progress and slowing down absorbance of the EU structural funds for the establishment of sufficient ICT networks across the country.

National priorities for facilitating the ICT uptake and DSM development:

- ICT management at the regional level;
- Development of the technological infrastructure of public administration;
- Improving the quality of services and data;
- Promotion of ICT literacy.

ICT priorities in the Moravian Silesian Region:

- Availability of grant resources;
- Increasing efficiency and optimizing ICT processes using modern technologies;
- Cooperation on the national and regional levels, improving cooperation between organizations.

The ICT uptake by SMEs in the Moravian Silesian Region is facilitated by locating a publicly available IT4IN super computer in the region. In addition, businesses of the region possess unique knowledge and competencies, resulting from the high concentration of the industry in the value chain "Coal-Steel-machine", which can be applicable for promoting new economic sectors (automotive, engineering, IT, measuring technologically advanced materials, mechatronics and robotics, environmental technology, energy savings, etc.), as well as promote investment in research and development. The Ostrava city with presence of the Technical University (VSB-TUO) has established necessary infrastructure for supporting innovative businesses. The Ostrava city has created a plan "Integrated Territorial Investment of Ostrava agglomeration to be implemented with an assistance of the EU funds.

Important legal barriers for the ICT development, namely promoting online sales, are related to inconsistent legal interpretations of Consumer Law, which needs to be unified with the procurement legislation to provide common standards and conditions. Also, a simple and transparent system for an online dispute resolution is missing.

Good practice examples from Ostrava, such as the Farmers portal, shows, how the publicly supported ICT infrastructure can help to promote the agriculture market. In addition, other regionally significant projects, such as the IT Academy; Educational info-portal of Moravian-Silesian Region; Project to support the development of human resources in research and development of advanced soft-computing methods and their practical use; ICT Centre of Ostrava; Integration of Ostrava city agenda systems; Development of metropolitan communication infrastructure of Ostrava city and others could help to promote the development of DSM in the region and promote an overall ICT development.

Taking into account research results **the most important challenges of the Moravian Silesian Region for promoting digitalisation of SMEs are related to improving regulatory framework, digital skills and cooperation between organizations on regional and national levels. On the national level main challenge is to improve the use of internet services, in particular for e-Government, entertainment and social purposes.**

²⁵ Eurostat, Enterprises using software solutions, like CRM to analyse information about clients for marketing purposes (2016)

2.3. SAXONY-ANHALT, GERMANY²⁶

Saxony-Anhalt is one of the 16 federal states of Germany, which borders with the four neighbouring states Brandenburg, Saxony, Thuringia and Lower Saxony. Saxony-Anhalt has a total area of 20,445 square kilometres and population of about 2.25 million inhabitants.

Territory of Saxony-Anhalt - 20 452 thousand km
Population of Saxony-Anhalt – 2.24 million inhabitants (2016)
GDP per capita (PPS per inhabitant; % of the EU28 average, NUTS2): EUR 24 300; 84% (2015)
Percentage of the ICT sector from GDP, % - 4.18 (national level, Germany, 2014)
Total R&D expenditure (GERD, NUTS2, % of GDP): 1.41 (2014)
Unemployment rate (NUTS2, %): 7.4 (2016)
Percentage of workforce working in the ICT sector, % - 2.6 (national level, Germany, 2014)

Most of the ICT data for Saxony-Anhalt are provided on the national level. Taking into account main DSM indicators analysed in Part 1.3 regional level data is slightly below the national average. However, DSM indicators are gradually improving.

According to the DESI index (2017), Germany ranks 11th among the EU member states. Germany is a leader in spectrum assignment. Germans are above average users of the Internet and their digital skills are progressing well. German citizens and companies are actively approaching the opportunities of e-commerce. However, Germans are reluctant to subscribe to fast broadband. Moreover, with only 19% e-Government users, the greatest challenge is to improve the online interaction between public authorities and citizens.²⁷

The World Digital Competitiveness Ranking 2017 placed Germany 17th among 63 countries. The greatest drawbacks are technological framework (26)²⁸ and adaptive attitudes (22)^{29,30}

Germany has its own Digital Agenda 2014-2020, where the Federal Government sets out guidelines for its digital policy and focuses on a number of actions. The Digital Agenda is accompanied by the Digital Strategy 2025 and the Action Programme on Digitalisation, which has been developed to implement the Digital Strategy 2025.

The main strategic planning document of Saxony-Anhalt is the Digital Agenda for Saxony-Anhalt launched on February 2017. The Ministry of Economics, Science and Digitisation decided to develop a digitisation strategy with other specialist branches by Autumn 2017.

The ICT-strategy "Digital Saxony-Anhalt 2020" and the Smart Specialisation Strategy 2014-2020 of Saxony-Anhalt are regional programmes and strategies referring to ICT. The ICT-strategy "Digital Saxony-Anhalt 2020" (Sachsen-Anhalt Digital 2020) presents guidelines and an agenda for developing the ICT potential and its targeted application in Saxony-Anhalt. The Smart Specialisation Strategy 2014-2020 of Saxony-Anhalt ("Regionale Innovationsstrategie Sachsen-Anhalt 2014-2020) is focused on the development of leading markets, as well as increasing ICT availability for the development of regional innovation potential. The ICT in Saxony-Anhalt is linked to the five leading markets: 1) machinery and plant construction, 2) health and medicine, 3) mobility and logistics, 4) chemistry and bio economy and 5) food and agriculture (RIS3).

²⁶ All demographic, economic, unemployment and R&D expenditure indicators are taken from the Eurostat Database Regional statistics (<http://ec.europa.eu/eurostat/data/database>) if not indicated otherwise. All ICT indicators are taken from Baseline Studies conducted by the SKILLS+ partners. The text is based on the information provided in the SKILLS+ partner's Baseline Study and author's own internet search.

²⁷ <https://ec.europa.eu/digital-single-market/en/news/digital-economy-and-society-index-desi-2017>

²⁸ Communications technology; Mobile broadband subscribers; Wireless broadband; Internet users; Internet bandwidth speed; High tech exports (%).

²⁹ E-participation; Internet retailing; Tablet possession; Smartphone possession; Attitudes toward globalization.

³⁰ https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

Main initiatives for supporting digitalisation and ICT uptake by SMEs in Saxony-Anhalt are related to the Strategic Facilitation of SMEs Businesses of Saxony-Anhalt ("Mittelstandsoffensive Sachsen-Anhalt"). Also, this has been planned that up to 10 additional Mittelstand 4.0-Competence centres established in Germany by the Federal Ministry for Economic Affairs and Energy will also be opened in the city of Magdeburg in Saxony-Anhalt.³¹

In addition, there are several regional support measures for the development and implementation of digitisation projects:

- Next generation access broadband expansion
- Consulting programme for enterprises
- Innovation assistant
- Knowledge and technology transfer
- Cross innovation
- SME and start-up funds
- Innovation voucher "digital innovation"
- Regional digitisation centres
- Joint task "improving regional economic structures"
- Support of R&D projects
- Ego incubator
- Ego founding transfer

The three most important factors for the digital development of SMEs identified in Saxony-Anhalt are: 1) infrastructure (IT Infrastructure and broadband availability), 2) technologies (IT qualification and digital possibilities) as well as competition (competitive constraints) and 3) ICT as a location factor and an essential driver for innovation).

The most important good practices for the development of SDM in Saxony-Anhalt are related to the Strategic Facilitation of SMEs Businesses of Saxony-Anhalt, ICT-strategy "Digital Saxony-Anhalt 2020" and Smart Specialisation Strategy Saxony-Anhalt 2014-2020.

Challenges of the ICT and digital development have been tackled with the assistance of the Operational Programme (OP) Strategic Objective (SA) No 2 related to increasing the innovative power of economy in lead markets defined by the Regional Research and Innovation Strategy for Smart Specialisation (RIS)³².

Main concerns expressed by the partner Ministry for Regional Development and Transport Saxony-Anhalt is about increasing a share of SME in rural areas and by using the ERDF funding to promote the integration of ICT in SMEs daily routines for securing competitive work places in rural areas and improving employment opportunities to prevent depopulation of Saxony-Anhalt's periphery.

Taking into account research results, **the main challenges of Saxony-Anhalt for promoting digitalisation of SMEs are related to improving digital skills and raising awareness of population, increasing IT competence and know-how by SMEs and their staff, as well as improving accessibility of broadband and technologies for SMEs, especially in rural areas. Improving the online interaction between public authorities and citizens is another national level concern in Germany.**

³¹ Further information in German on <http://www.mittelstand-digital.de/DE/Foerderinitiativen/Mittelstand-4-0/kompetenzzentren.did=726302.html> and on <http://www.lsa-partnernetzwerk.de/>.

³² The Operational Programme can be found here http://www1.europa.sachsen-anhalt.de/2007-2013/2014-2020_Diskussion/OP_EFRE_2014-2020_Stand_2014_12_19.pdf.

2.4. WESTERN MACEDONIA (DYTIKI MAKEDONIA), GREECE³³

The Region of Western Macedonia is the gateway between European Union and Western Balkans. It is located in the Northwest part of Greece and is the only region of the country without any access to the sea. The Region of Western Macedonia is part of a larger region – Voreia Ellada. Western Macedonia borders with Albania and the Former Yugoslav Republic of Macedonia. Most of the region is covered by mountains.

Territory of Western Macedonia – 9 471.0 km
Population of Western Macedonia – 273 843 thousand (2016)
GDP per capita (PPS per inhabitant; % of the EU28 average, NUTS2): EUR 18 200, 63% (2015)
Percentage of the ICT sector from GDP, % - 1.84 (national level, Greece, 2014)
Total R&D expenditure (GERD, NUTS2, % of GDP): 0.41 (2014)
Unemployment rate (NUTS2, %): 31.3 (2016)
Percentage of workforce working in the ICT sector, % - 1.43 (national level, Greece, 2014)

Greece ranks 26th among the EU member state according to the DESI (2017). Overall, Greece did not make much progress compared to other EU member states. On the positive side, Greeks are more actively using the Internet for video calls and online content. However, the country's low performance in digital skills is hindering further development of its digital economy and society.

According to the World Digital Competitiveness Ranking 2017³⁴, Greece ranks the 50th among 63 countries. The most important problems are related to capital³⁵ (58) and training & education³⁶ (55).

The strategic goals set out by the Greek e-Government Strategy 2014-2020 are the following:

1. Modernisation of public administration;
2. Reconnection of citizens with public administration;
3. Coordination of horizontal ICT policies within the public administration.

Typically, most of businesses in Western Macedonia are SMEs and micro-enterprises, which create particular disadvantages for innovation outcomes, export promotion, as well as digitalisation. Also, business networks and clusters do not exist. Therefore, the innovation is mainly driven by the improvement of products and services, but the improvement of existing technology comes only afterwards. The cost of innovation, as well as technology, and availability of the required capital is a barrier to innovation performance. Other factors are related to bureaucracy, regulatory framework and lack of public sector support. Regional companies don't fully exploit their potential of internationalisation, because of the lack of national and regional internationalisation strategies, lack of support and insufficient export promotion. Taking into account the above described conditions, promotion of the e-commerce is especially important.

It is expected that the Programme "Upgrading micro and small existing businesses to develop their capacity in new markets" implemented under the Greek OP "Competitiveness - Entrepreneurship - Innovation of the National Strategic Reference Framework 2014-2020" will support micro-enterprises and SMEs mainly working in the strategic priority sectors: agro-food, energy, cultural and creative industries, supply chain, environment, information and communication technologies (ICT), health and construction. Among other things it will support the modernisation of equipment, as well as

³³ All demographic, economic, unemployment and R&D expenditure indicators are taken from the Eurostat Database Regional statistics (<http://ec.europa.eu/eurostat/data/database>) if not indicated otherwise. All ICT indicators are taken from Baseline Studies conducted by the SKILLS+ partners. The text is based on the information provided in the SKILLS+ partner's Baseline Study and author's own internet search.

³⁴ https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

³⁵ IT & media stock market capitalization; funding for technological development; banking and financial services; investment risk; venture capital; investment in telecommunication

³⁶ Employee training; total public expenditure on education; higher education achievement; pupil-teacher ratio (tertiary education); graduates in sciences; women with degrees

introduction and/or increase of the use of ICT to help Greek businesses to improve their level of digitisation and an overall level of competitiveness.

The most important ICT and digital developments in the Region of Western Macedonia implemented with the support of EU Cohesion Funds during 2007-2013 programming period are the following:

- ✓ Broadband connectivity infrastructure.
- ✓ The national action called Digi-Content, which supported Greek enterprises' ICT uptake in order to implement investment plans on the digital broadband content.
- ✓ The national action called Digi-Lodge, which supported the Greek hospitality sector to uptake ICT and establish promotion websites and online reservation systems.
- ✓ The national action Digi-Retail, which supported Greek retail enterprises' ICT uptake in order to implement investment plans on general digital investment.

Regarding the development of ICT and digitalisation, the Regional Innovation Strategy (RIS3) of Western Macedonia is in line with the Regional Operational Programme, 2014-2020, setting the objective to improve the existing services for citizens with a parallel exploitation of ICT. The main planned actions are:

- ✓ Improvement of productivity of the Region enhancing the use of ICT by (a) promotion of the use of ICT in enterprises; (b) provision of e-services for enterprises and re-design of local governance procedures; (c) enforcement of the ICT sector in the regional economy; and (d) promotion of local entrepreneurship in the ICT intensive sectors.
- ✓ Improvement of the quality of services by a) improvement of daily life by enhancing the use of ICT – equal participation of all citizens in the Digital Greece; and b) development of local e-Government services for citizens; c) promotion of the cultural heritage of the Region through the use of ICT.

The expert team has conducted the Regional Assessment of the Western Macedonia Smart Specialization Strategy (RIS3) for the DG REGIO of the European Commission³⁷.

According to the Regional Assessment:

- ✓ There is currently no detailed regional ICT strategy per sector.
- ✓ There is not a single Master Plan for e-Government services. Most of the plans (Cadastre, e-Prescription, e-invoicing, etc.) are administered by national authorities, while other services like local taxation or regional permits are under the responsibility of regional administrations.
- ✓ All e-government services should adhere to well-defined interoperability standards, and should be based on dependable cloud computing platforms.
- ✓ There is no reference to viable plans for the deployment of a new networks, and the extension of next generation access networks.
- ✓ The Region should prepare the creation of an inventory of the ICT infrastructure.
- ✓ The Region should support the active involvement of the private sector in ICT activities.

According to the SKILLS+ partner report, one of the objectives of the Regional Operational Programme of Western Macedonia is to promote the region as a "digital region" with innovative businesses. Despite an overall increase in broadband connectivity, access to both remote and rural areas still remains restricted due to high costs resulting from both low population density and long distances. Also, the demand for ICT products and services in the Region of West Macedonia is low due to a small income and the lack of digital skills of population. Businesses and citizens of peripheral parts of the region alike experience the negative impacts of the digital and broadband gap in relation to urban centres.

Situation could be improved by applying the following solutions:

- ✓ Ensuring broadband coverage up to the most distant rural locations.
- ✓ Supporting Local Government's Broadband Service.

³⁷ <http://www.urenio.org/wp-content/uploads/2013/04/RIS3-review-report-Western-Macedonia-final-edited-2012.pdf>

- ✓ Providing Public Services even to the most remotely located citizen.
- ✓ Supporting entrepreneurship by creating new firms based on wireless technology.
- ✓ Encouraging innovation and creating employment opportunities.
- ✓ Familiarising citizens in remote and rural areas with new technologies.
- ✓ Making broadband services available to remote and rural areas, supporting local communities in attracting investments and improving their public and educational services.

The region of Western Macedonia has the necessary higher education and research infrastructure for the ICT development and uptake. The Region hosts a University, a Technological Institute and a research institute, which all include departments focusing on ICT. However, talented ICT professionals, as well as young graduates of ICT-related study programmes are moving to other regions and countries as finding ICT jobs in the Western Macedonia is difficult.

According to the SKILLS+ partner report and the Regional Development Strategy, it is considered that the greatest beneficiaries of digitalisation will be the following sectors: agriculture and animal husbandry; food & beverages; energy and tourism. In the areas of e-Government and e-learning, properly designed and interoperable with e-Government apps combined with proper initial training applications are considered as a major contribution towards efficiency and transparency, as well as overcoming the barrier of low IT skills. With respect to health services, new telemedicine or home-care services could help reach people living in remote mountainous locations. Health services could be provided by public-private partnerships (PPPs) in cooperation with local state hospitals and health centres. The availability of affordable broadband connections for all households is a major Regional target. Therefore, it should further extend broadband availability and take-up in the Region. More specifically, it should help to establish local Industrial Zones/Parks as “FttH-ready”, i.e. bringing fibre optics to each enterprise, as well as selected households. It is also crucial to facilitate setting up of public free-access hot-spots in public places, schools, sports/recreation areas, churches, etc. The Region should also investigate ways on how to improve the utilisation of existing metropolitan access optical networks (MANs), and provide proper incentives for the expansion of next generation cellular networks (e.g. LTE) within the Region.

There are particular problems and limitations for the ICT uptake and digitalisation on a national, as well as on a regional level of Greece. According to the SKILLS+ partner report, failures on a national level resulted from rigidity and bureaucracy of the public administration. In the context of the National Strategic Reference Framework (2007-2013), fostering of the ICT uptake was among priorities of the Greek government. However, several policy driven obstacles and weaknesses related to the technical design and planning, as well as other related factors, didn’t allow the efficient adoption and implementation of support measures, such as the OP “Digital Convergence”, related to the stimulation of ICT use and digitalisation in Greece.

The most notable ICT projects supporting the ICT uptake by SMEs, which have been implemented in the recent years and have facilitated the use of digital tools are related to the implementation of metropolitan access optical networks (MAN) and municipal wireless hot-spots, the development of content for the disabled, digitising of cultural content, and the networking of the higher education institutions and the school units to the national research and education network and the Internet.

Taking into account research results, **the main challenges of the Western Macedonia for promoting digitalisation of SMEs are related to the improvement of digital skills, increasing efficient public support for the ICT and related SMEs development, improving on-line services and their accessibility, as well as improving connectivity in the rural areas.**

2.5. CASTILLA Y LEÓN, SPAIN³⁸

Castilla y León (CYL) is the largest of 17 Spanish autonomous regions and one of the largest regions of the European Union. Around 96.5% of the region's territory is rural. Castilla y León borders with nine regions of Spain and Portugal. One of main features of Castilla y León is its vast cultural heritage. Eight cultural heritage sites are registered on the UNESCO World Heritage List and there are around two thousand other Assets of Cultural Interest. A lot of economic activity is related to conservation, protection and exploitation of the cultural heritage sites.

Territory of Castilla y León – 94 227.0 km²; very low population density: 26.5 p/km² (2014)³⁹
Population of Castilla y León – 2.45 million (2016)
GDP per capita (PPS per inhabitant; % of the EU28 average, NUTS2): EUR 24 300; 84% (2015)
Percentage of the ICT sector from GDP, % - 3.18 (national level, Spain, 2014); ~1.0 (regional level, CYL, 2014)
Real growth rate (Gross Value Added, basic prices, NUTS2): 2.2 (2015)
Total R&D expenditure (GERD, NUTS2, % of GDP): 1.01 (2014)
Unemployment rate (NUTS2, %): 15.08 (2016)
Percentage of workforce working in the ICT sector, % - 2.2 (national level, Spain, 2014)

According to the DESI (2017) Spain ranks the 14th among the EU member states. Spain's performance in the use of digital technologies by enterprises and in the delivery of online public services is above the EU average. In Connectivity, progress is particularly strong in terms of subscriptions to fast broadband and NGA coverage is also high. Compared to last year, Spain made progress on all dimensions, except for Human Capital.⁴⁰

The World Digital Competitiveness Ranking 2017 placed Spain 30th among 63 countries. The most problematic areas are business agility⁴¹ (47) and training & education⁴² (42).

CYL has its own Smart Specialization Strategy (RIS3), which continues the path of the Regional Technology Plan of 1997 and related planning documents. RIS3 is the main R&D and Information Society's Planning Document 2014-2020 addressing digital economy and information society as cross-cutting issues. ICT plays a central role with respect to citizens, government, and modernisation of entrepreneurial activities. CYL has strengths in several specific areas, such as mobile applications and technology, cybersecurity, Big Data, Internet of the Future, Cloud Computing, all of which are cross-cutting technologies for any economic activity and specifically for those considered for the region's economic specialisation pattern. (Please, see RIS3 summary in English here: http://www.jcyl.es/junta/cp/Resumen_RIS3_eng_20140626.pdf)

There is a close connection between the CYL ERDF (European Regional Development Fund) Operational Programme (OP) with the RIS3⁴³, which contains the Digital Agenda for CYL – an instrument to increase competitiveness of SME by making ICT a tool to boost innovation, social and territorial cohesion, rural development, growth and employment.

The main policy instrument is the CYL Operational Programme (OP)⁴⁴ (2014-2020) includes a set of challenges, which based on identified needs will serve as strategic guidelines for implement actions.

³⁸ All demographic, economic, unemployment and R&D expenditure indicators are taken from the Eurostat Database Regional statistics (<http://ec.europa.eu/eurostat/data/database>) if not indicated otherwise. All ICT indicators are taken from Baseline Studies conducted by the SKILLS+ partners. The text is based on the information provided in the SKILLS+ partner's Baseline Study and author's own internet search.

³⁹ <http://population.city/spain/adm/castile-and-leon/>

⁴⁰ <https://ec.europa.eu/digital-single-market/en/news/digital-economy-and-society-index-desi-2017>

⁴¹ Opportunities and threats; Innovative firms; Agility of companies; Use of big data and analytics; Knowledge transfer.

⁴² Employee training; Total public expenditure on education; Higher education achievement; Pupil-teacher ratio (tertiary education); Graduates in science; Women with degrees.

⁴³ http://www.cienciaytecnologia.jcyl.es/web/jcyl/CienciaTecnologia/es/Plantilla100/1284453911056/_/_/_
(In Spanish)

⁴⁴ [PO Castilla y León FEDER 2014-2020.pdf](#)

For instance, one of main challenges is the promotion of ICT development as a means of supporting access to this resource, aiming to boost the information society and ensuring a sustainable economic recovery.

The OP ERDF CYL 2014-2020 is focusing on improving access to the ICT, its use and quality, as well as on the expansion of broadband deployment and support for the adoption of emerging technologies and networks for the digital economy; encouraging the deployment of networks and services to ensure digital connectivity; developing ICT products and services, electronic commerce and greater ICT demand; developing the digital economy, including e-commerce; strengthening ICT applications for e-Government, e-learning, e-inclusion, e-culture and e-health; promoting digital literacy, e-learning, e-inclusion, e-health and digital solutions in these fields; reinforcing e-government, e-culture and trust in the digital field.

Taking into account the significance of historical heritage sites in the CYL regional development, the Plan PAHIS/CYL Historical Heritage Plan 2014-2020 should be emphasised. This Plan establishes the strategy for management of CYL cultural assets and also includes the implementation of a new technological information and communication of cultural heritage such as the e-Heritage programme for the development of new features and applications that encourage and enhance networking with companies, users and social networks, as well as ensures the distance management of cultural heritage sites.

CYL has a well-developed telecommunication's infrastructure. However, because of the dispersion of the population, it has difficulties in telecommunication's infrastructure deployment. There is a large difference between enterprises with less than 10 employees and more than 10 employees in terms of the usage of ICT. In small enterprises with less than 10 employees, the exploitation of ICT is very low.

The most important regional initiatives related to the ICT development are:

- 1) Digital CYL Programme CYL Digital Community – a regional platform, which offers virtual and physical spaces for face-to-face and online learning, as well as sharing ICT experiences;
- 2) ADE RURAL - a new public service oriented to the promotion of economic activity and creation of new enterprises in rural areas, as well as supporting already existing enterprises to enhance their competitiveness by means of innovation, internationalisation and attraction of financial resources;
- 3) “Call for Aids” initiative for promoting Internet access in rural areas by using satellite technologies.

Also, CYL benefits from national level digital initiatives. The most important initiatives for the regional development are: 1) CIRCE - Information Centre and Business start-up network; 2) Dynamic Guide for Grants and Incentives; 3) PAE (Entrepreneur Points of Contact); 4) Red.es - the public corporate entity established by the Ministry of Industry, Energy and Tourism (MINETUR), which is responsible for promoting the development of information society in Spain.

On a local level (Valladolid), the most important digital initiative is the Valladolid Emprande (Valladolid Entrepreneurs) - Entrepreneur Support Portal. The Valladolid local government is also planning to create the Online Selling Platform in order to promote online sales.

According to indicators provided by the CYL Regional Government Statistics⁴⁵, the biggest drawbacks for the ICT uptake are related to high costs of ICT equipment, lack of funds and external financial resources, uncertainty about demand of innovative products or services and assumption that there is no demand for innovation.

Taking into account research results, **the most important challenges of the Castilla y León Region for promoting digitalisation of SMEs are related to attracting funding, as well as ICT specialists, increasing ICT skills and raising awareness about benefits of digitalisation.**

⁴⁵ https://estadistica.jcyl.es/web/jcyl/Estadistica/es/Plantilla100/1284159004620/_/_/ (Please, once you open the link, download the excel called “Innovación en las Empresas 2015 (tablas) (240 kbytes)”. Once opened, please choose “Table nº 25” and open it for further details)

2.6. JADRANSKA HRVATSKA, ZADAR, CROATIA⁴⁶

Croatia is located between Middle and South-East Europe at the Adriatic Sea. It borders with Slovenia and Hungary on the North, with Serbia on the East, and with Bosnia and Herzegovina, and Montenegro on the South, while on the sea it borders with Italy. The County of Zadar is located in the Jadranska Hrvatska (Adriatic Croatia) region. 92.8% of the County of Zadar territory is rural. Because of the favourable location and climate, County of Zadar is a popular touristic destination.

Territory– 3 646.00 km² (County of Zadar)
Population: - 1.4 million (Jadranska Hrvatska, 2016); 170 017 (County of Zadar)
GDP per capita (PPS per inhabitant; % of the EU28 average, NUTS2): EUR 16 000; 55% (2015)
Percentage of the ICT sector from GDP, %: 4.1 (national level, Croatia, 2014)
Total R&D expenditure (GERD, NUTS2, % of GDP): 0.37 (2014)
Unemployment rate (NUTS2, %): 14.2 (2016)
Percentage of the workforce working in the ICT sector, %: 2.19 (national level, Croatia, 2014)

According to the DESI (2017), Croatia ranks the 24th among EU member states. Croatian citizens are above average users of the Internet and their digital skills are steadily progressing. The use of digital technologies by enterprises is close to average. Digital Public Services are slowly improving. However, Croatia's low performance in Connectivity could slow down the further development of its digital economy and society.⁴⁷

According to the World Digital Competitiveness Ranking 2017⁴⁸, Croatia ranks the 48th among 63 countries. The biggest problem areas are business agility⁴⁹ (62) and talent⁵⁰ (59).

The Smart Specialization Strategy 2016-2020 (RIS3)⁵¹ of the Republic of Croatia has been adopted on the national level. ICT is included into priorities of the RIS3 as a cross-sectoral factor. The objective of strengthening the ICT sector is to support the development of an entire society by strengthening the economy, health care, education, cultural identity, public management and administration, and also to raise the quality of life in general.

The main strategic document for promoting digitalisation of Croatia is the E-Croatia 2020 Strategy⁵² focusing on improving the quality of life for citizens by increasing the economic competitiveness through ICT and high quality cost-effective electronic public services. The E-Croatia Strategy was adopted on 26th May 2017.

The new e-Government Action Plan 2017-2020⁵³, adopted on December 2016, will facilitate the modernisation of public administration through ICT (digitisation of all public administration processes); cross-border interoperability of public administration; and encourage digital interaction between public administration and its users. In addition, the Action plan for Reducing Administrative

⁴⁶ All demographic, economic, unemployment and R&D expenditure indicators for Jadranska Hrvatska Region are taken from the Eurostat Database Regional statistics (<http://ec.europa.eu/eurostat/data/database>) if not indicated otherwise; all indicators for Zadar County are taken from the SKILLS+ Baseline Study of Zadar. The text is based on the information provided in the SKILLS+ partner's Baseline Study and author's own internet search.

⁴⁷ <https://ec.europa.eu/digital-single-market/en/news/digital-economy-and-society-index-desi-2017>

⁴⁸ https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

⁴⁹ Opportunities and threats; Innovative firms; Agility of companies; Use of big data and analytics; Knowledge transfer.

⁵⁰ Educational assessment PISA – Math; international experience; foreign highly-skilled personnel; management of cities; digital/technological skills; net flow of international students

⁵¹ https://mzo.hr/sites/default/files/migrated/strategija_pametne_specijalizacije_rh_2016_2020.pdf

⁵² [https://uprava.gov.hr/UserDocsImages/e-Hrvatska/e-Croatia%202020%20Strategy%20\(20.01.2016.\).pdf](https://uprava.gov.hr/UserDocsImages/e-Hrvatska/e-Croatia%202020%20Strategy%20(20.01.2016.).pdf)

⁵³ <http://europski-fondovi.eu/sites/default/files/dokumenti/Akcijski%20plan%20provedbe%20Strategije%20razvoja%20javne%20uprave%20za%20razdoblje%20od%202017.%20do%202020.%20godine.pdf>

Burden of Economy⁵⁴ aims at creating stimulating the investment climate, simplifying conditions for operations and providing easy access to the service market.

The National Information Infrastructure Act was adopted on July 2014 to improve functions of the public administration and its cooperation with citizens and businesses, with the aim to ensure e-public services for citizens and businesses, which are based on an integrated national information system, as well as to lower administrative burdens for citizens and businesses.

The National Indicative Program for Development of Broadband Infrastructure in Areas Where There is Insufficient Commercial Interest for Investment⁵⁵ – is a framework programme for developing a broadband infrastructure of the next generation access (NGA) in areas where businesses are not interested in investing and public funds should be used. This programme is supported by the Initiative for the Development of Internet and Broadband Internet Access in the Areas of a Special State Concern, Mountain Areas and Islands.⁵⁶

The digitalisation of Croatia is mainly promoted by the facilitation of businesses, lower internet prices, increased number of literate people, safer Internet connection, high speed Internet, and lifestyle, etc. According to the research conducted by the Croatian Employers' Association in 2016, around 25% of Croatian enterprises had a digital strategy as a single document or as a part of the company's strategy. Around 60% of enterprises expect increase in revenues by 10% as a result of digitalisation.

The main obstacles for the development of ICT in Croatia are: 1) scarcity of information; 2) lack of time for training and using ICT systems; 3) insufficient level of computer education; 4) low purchasing power of citizens; 5) poor and non-existing ICT infrastructure, especially in rural areas. Taking into account that most of Croatia and also Zadar are rural areas, the lack of ICT infrastructure and low connectivity is a real problem for digitalisation of businesses.

The Operational Programme "Competitiveness and Cohesion 2014-2020"⁵⁷ is considered as the most important support instrument for the ICT uptake by SMEs in Croatia. Its expected impacts are that 53% of the households will be covered by broadband coverage (instead of 33% in 2013) and 50% of primary and secondary schools will be e-connected and using e-learning.⁵⁸

It is expected that with the assistance of EU Cohesion Funds, the following initiatives will be implemented:

- ❖ Introducing and implementing e-business solutions provided by ICT;
- ❖ Optimising business processes, integrating business functions, streamlining workflows and enhancing interactions with clients and suppliers;
- ❖ Improving SME's market position and increasing their competitiveness;
- ❖ Creating and launching e-services, including customer relationship management and those between enterprises (B2B), e.g. ICT solutions aimed at establishing processes that extend beyond the boundaries of the enterprise such as the supply chain management;
- ❖ Training employees to work with new ICT systems;
- ❖ Implementing supporting initiatives aimed at digitalisation of business services and products.

The most important ICT initiatives for facilitating SMEs development in Croatia are:

E-business (FINA) which enables easy electronic communication between business partners through submission of forms, access to information services, payment, exchange of electronic invoices and electronically signed documents. A special attention is paid to ongoing development of web services and advancement of e-business in the Republic of Croatia.

E-business Competitiveness Improvement Project in which the main objective of this project was to enhance the competitiveness of Croatian enterprises by increasing their e-business and e-commerce

⁵⁴ <https://www.mingo.hr/page/donosjenjem-akcijskog-plana-zapocinjje-sustavno-rezanje-troskova-gospodarstvu>

⁵⁵ <http://www.mppi.hr/UserDocsImages/VRH-ONP-objava.pdf>

⁵⁶ <https://www.hakom.hr/UserDocsImages/2012/studije/Studija-Program%20razvoja%20BB.pdf>

⁵⁷ http://www.strukturnifondovi.hr/UserDocsImages/Novosti/Programme_2014HR16M1OP001_1_2_en.pdf

⁵⁸ http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/croatia/2014hr16m1op001

awareness and activities. The Project's activities are divided into two components targeting both – Business Support Centres and SMEs. E-business was co-financed from IPA IIIC and implemented between May 2010 and March 2012. IPA IIIC was a part of pre-accession assistance, also one of the subcomponents of the Regional Development Programme 2007-2013.

The most important ICT initiatives for facilitating SMEs development in the County of Zadar are:

- ❖ Innovative Zadar - the first and only business incubator in Zadar, which offers complete business solutions based on top quality services and leading world technologies. It aims at developing a virtual local government and building up a "smart city" by building IT infrastructure, merging databases and local government services and developing a platform for providing e-services.
- ❖ COIN Zadar offers a public co-working space to increase self-employment opportunities, upgrade support services for SMEs, foster entrepreneurship and self-employment, and increase the competitiveness of micro entrepreneurs. The project was started on June 2014 and finished at the end of 2015. The project coordinator was the City of Zadar, and beneficiaries were Association of Trades and Crafts Zadar, Zadar County, Croatian Chamber of Economy – County Chamber of Zadar and Public Institution Agency for Development of Zadar County ZADRA NOVA.

Taking into account research results, **the main challenges of Croatia and Zadar for promoting digitalisation of SMEs are related to improving connectivity and establishing ICT infrastructure in rural areas, ensuring availability of online public services, as well as improving digital skills and raising awareness of population.**

2.7. REPUBLIC OF LATVIA⁵⁹

Latvia is located in the North East part of the Baltic Sea and it borders with Estonia, Russia, Belarus, and Lithuania. Latvia also has a maritime boundary with Sweden.

Territory of Latvia - 64.6 thousand km
 Population of Latvia - 1 million 954.6 thousand people (end of 2016)
 GDP per capita (PPS per inhabitant; % of the EU28 average, NUTS2): EUR 18 600, 64% (2015)
 Percentage of the ICT sector from GDP, % - 3.77 (2014)
 Real growth rate (Gross Value Added, basic prices, NUTS2): 2.5% (2015)
 Total R&D expenditure (GERD, NUTS2, % of GDP): 0.69 (2014)
 Unemployment rate (NUTS2, %): 9.6 (2016)
 Percentage of workforce working in the ICT sector, % - 3.03 (2014)

The ICT and DSM indicators are showing positive trends for Latvia, except for a declining number of the ICT specialists in enterprises. Some of the indicators, like the percentage of SMEs selling online, are still quite low and showing some volatility during the period of time from 2010 to 2016. In addition, a share of employees using computers and computers with Internet connection in their job regularly, as well as use of computers and Internet in enterprises has slightly decreased in 2016 compared to 2015.

According to the DESI index (2017), Latvia ranks 19th among the EU member states. Compared to the previous year, overall progress is driven by increasing shares of fast broadband subscriptions, as well as by improved delivery of public services. While many more Latvians are going online and using e-Government services, around a half of the population still has no or low digital skills. Also, Latvians are increasingly shopping online, but businesses are exploiting technology in a limited way.⁶⁰

⁵⁹ All demographic, economic, unemployment and R&D expenditure indicators are taken from the Eurostat Database Regional statistics (<http://ec.europa.eu/eurostat/data/database>) if not indicated otherwise. All ICT indicators are taken from Baseline Studies conducted by the SKILLS+ partners. The text is based on the information provided in the SKILLS+ partner's Baseline Study and author's own internet search.

⁶⁰ <https://ec.europa.eu/digital-single-market/en/scoreboard/latvia>

The World Digital Competitiveness Ranking 2017 placed Latvia 35th among 63 countries. Main drawbacks are related to scientific concentration⁶¹ (47), adaptive attitudes⁶² (46) and business agility⁶³ (41).⁶⁴

The Ministry for Environmental Protection and Regional Development (MoEPRD) of the Republic of Latvia is responsible for the development of Information Society, including e-Government, digital infrastructure, as well as promotion of the DSM in Latvia. MoEPRD manages the main medium term planning document for ICT - Information Society Development Guidelines 2014-2020 (thereafter – guidelines) which are developed in order to continue the current action policy in the field of information society development and determine the priorities of the ICT field for the EU Structural Funds planning period 2014-2020. Guidelines has proposed 7 action directions including ICT education and e-skills; widely available access to the Internet; advanced and effective public administration; e-services and digital content for public; cross-border cooperation for Digital Single Market; ICT research and innovation etc.

The ICT development is also set as one of the five priority areas of Latvia's Smart Specialization Strategy (RIS3) with a cross sectoral significance, which is also reflected in the national level strategic planning documents.

On the Governmental level, the SMEs ICT uptake is being facilitated through the Annual Business Environment Improvement Action Plan⁶⁵ implemented by the Ministry of Economics of the Republic of Latvia. The Action Plan is mainly focused on improving the ICT and digital skills of SMEs employees with the assistance of EU Structural Funds. The ICT training activities are mainly carried out in cooperation with the Latvian Information and Communications Technology Association (LIKTA). In addition, the information campaign "e-Skills Week" implemented by the MoEPRD helps to increase the awareness of availability and use of e-services, training, ICT tools, etc.

The MoEPRD in cooperation with local authorities of Latvia has established 92⁶⁶ State and Municipal Unified Customer Service Centres in main municipalities and regional centres to facilitate the use of a public e-services and promote the use of ICT solutions in a wider public.

A private initiative – Latvian IT cluster⁶⁷ has established the Riga IT Demo Centre, which serves as a platform for the DSM development in Latvia, as well as provides opportunities to learn about digitisation and use of ICT solutions for business.

Taking into account research results, **the main challenges of Latvia for promoting digitalisation of SMEs are related to improving digital skills and e-participation of the population, as well as increasing the use of ICT and online opportunities by businesses.**

⁶¹ Total expenditure of R&D (%); Total R&D personnel per capita; Female researchers; R&D productivity by publication; Scientific and technical employment; High-tech patent grants.

⁶² E-participation; Internet retailing; Tablet possession; Smartphone possession; Attitudes toward globalization.

⁶³ Opportunities and threats; Innovative firms; Agility of companies; Use of big data and analytics; Knowledge transfer.

⁶⁴ https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

⁶⁵ https://www.em.gov.lv/en/sectoral_policy/industrial_policy/entrepreneurship/business_environment/

⁶⁶ A number of State and Municipal Unified Customer Service Centres is still increasing. This number has been updated by the Ministry of Environmental Protection and Regional Development of Latvia on 14th November 2017.

⁶⁷ <http://www.itbaltic.com/en/home/>

2.8. PANNON NOVUM WEST-TRANSDANUBIA, HUNGARY⁶⁸

The West-Transdanubian Region is located on the Western part of Hungary and it borders with four countries – Austria, Slovenia, Croatia and Slovakia (NUTS2)⁶⁹. Geographical location and good potential for attracting FDI reinforced the Region's industrialisation and economic development with specialisation in manufacturing industries, mainly machinery and equipment, automotive, and electronics.

Territory of West-Transdanubian Region – 11 328.0 km
Population of West-Transdanubian Region – 983 933 thousand (2016)
GDP per capita (PPS per inhabitant; % of the EU28 average, NUTS2): EUR 21 500; 75% (2015)
Percentage of the ICT sector from GDP, % - 4.2 (national level, Hungary, 2014)
Total R&D expenditure (GERD, NUTS2, % of GDP): 0.66 (2014)
Unemployment rate (NUTS2, %): 2.7 (2016)
Percentage of workforce working in the ICT sector, % - 2.72 (national level, Hungary, 2014)

Hungary ranks the 21st in DESI 2017 among the EU member states. Hungary performs well on Connectivity, thanks to the wide availability of fast fixed broadband (NGA) and 4G as well as to the increasing broadband take-up. Hungary improved in digital skills, but stands still slightly below the average. The key challenges remain the low use of ICTs by enterprises and the development of Digital Public Services.⁷⁰

According to the World Digital Competitiveness Ranking 2017⁷¹, Hungary ranks the 44th among 63 countries. The main problems are in the areas of business agility⁷² (58) and adaptive attitudes⁷³ (57).

The West Transdanubian Region has its own Smart Specialization Strategy (RIS3). Its main priorities are:

- ❖ Creating of institutions, which constitute a well-functioning regional innovation system;
- ❖ Improving regional economic actors' innovation performance;
- ❖ Supporting high value added knowledge-based activities.

The RIS3 identifies the key specialisation sectors: machine industry, car industry, electro mechanics; forestry and wood industry; health, thermal tourism; logistics; ICT; agriculture.

The National ICT Strategy is in the line with the EU Digital Agenda. Its main objectives are the following:

- ❖ Digital infrastructure: availability of the electronic communications infrastructure with a bandwidth required for the supply and use of digital services in all segments of the network (backbone, district and local network);
- ❖ Digital competences: development of the digital competences of the population, micro, small and medium-sized enterprises and public administration employees, reduction of the primary (digital illiteracy) and secondary (low degree of utilisation) digital divide, enabling micro and small enterprises and public administration employees to recognise business opportunities resulting from the introduction of ICT systems and to make use of those opportunities, as well as making available the benefits of the digital ecosystem to those lagging behind durably (e-inclusion);

⁶⁸ All demographic, economic, unemployment and R&D expenditure indicators are taken from the Eurostat Database Regional statistics (<http://ec.europa.eu/eurostat/data/database>) if not indicated otherwise. All ICT indicators are taken from Baseline Studies conducted by the SKILLS+ partners. The text is based on the information provided in the SKILLS+ partner's Baseline Study and author's own internet search.

⁶⁹ Most of the Eurostat data used for the study are provided on the NUTS2 level.

⁷⁰ <https://ec.europa.eu/digital-single-market/en/news/digital-economy-and-society-index-desi-2017>

⁷¹ https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

⁷² Opportunities and threats; Innovative firms; Agility of companies; Use of big data and analytics; Knowledge transfer.

⁷³ E-participation; Internet retailing; Tablet possession; Smartphone possession; Attitudes toward globalization

- ❖ Digital economy: development of the external and internal information systems of the ICT sector in a narrow sense of its definition and the enterprises using the electronic (commercial, banking, etc.) services of the sector, and incentives to ICT development and research-development and innovation activities for development based on ICT;
- ❖ Digital state: supply of internal IT services supporting the operation of the government, electronic public administration services for the population and corporate target groups and other electronic services within the scope of interest of the state (e.g., health, education, library, cultural heritage related services or services aimed at the division of the state data and information assets), as well as ensuring the security of those services.

Three horizontal factors, which in terms of the context appear as the most relevant pillars have been identified:

- ❖ E-inclusion: conducting the ICT development by ensuring that disabled individuals and citizens lacking financial resources, competences or motivation, being excluded from the digital ecosystem should also benefit from the digital ecosystem as much as possible;
- ❖ R+D+I: increase in the research-development and innovation activity of the actors of the digital economy (especially the ICT sector), at the same time taking into account requirements of other sectors using ICT instruments and applications intensively, i.e., public administration and the population;
- ❖ Security: maximum protection of the critical information infrastructures, public administration internal systems and external applications, and the user data contained therein, and regular information to the users on the actual security risks and the options of managing them.

Digital literacy is considered a key factor for improving competences for employability, as well as for the ICT uptake and digitalisation of SMEs.

Support for the SMEs ICT uptake is provided by the Economic Development and Innovation Operational Programme. At the end of 2016, the call “Supporting corporate complex information and mobile development, and the spreading of cloud-based online business services GINOP-3.2.2.-8.2.4-16” was launched to support the IT development of SMEs and speed-up cloud-based online business services. The call supports SMEs, which are based in less developed areas, have branches or establishments there, and have an average annual statistical staff of at least two. Primarily, this call can fund the purchase of corporate management systems, software and related hardware (computers, notebooks, printers, tablets, radiotelephones). This is for the acquisition of information technology tools for the introduction and operation of enterprise process management, electronic commerce systems and mobile techniques. This call consists of two components: non-refundable and reimbursable. The maximum amount of non-refundable part is 35% of total eligible costs, and the maximum amount of aid to be refundable is 55% (1% interest rate/year) of total eligible costs. To implement this project, 10% own contribution is needed.

The majority of domestic rural enterprises have necessary infrastructure to take part in the e-economy (computer or broadband Internet), while micro and small enterprises employing 10 people or fewer are still significantly lagging behind their EU peers. Therefore, promoting internal and external corporate IT development and ICT-based innovation is an important objective. The digital economy investment priorities were set according to their development needs and by identifying reasons behind the biggest market failures.

The interview results confirm that the degree of digitisation is very low in companies with less than 10 people, where only few companies have a website and use electronic business applications. Bigger SMEs use digital technologies more often, which include websites, social media sites, on-line business administration and financial systems, CRM systems, billing and inventory, logistic systems, and webshops. Also, stakeholders suggest that the most of progress for SMEs digitalisation could be achieved through the Economic Development and Innovation Operational Programme (GINOP) support schemes.

An additional problem is a lack of knowledge of advantages provided by ICT application. The Digital Entrepreneurship program should help to increase awareness of digitalisation perspectives. The lack of broadband, costs of Internet and low digital literacy are also considered to be a problem. One of the

solutions could be the integrated enterprise management (ERP) system and the customer relationship management (CRM) system. Traditional paper based processes should be moved to the digital space and make products and services available via the broadband Internet on company websites, as well as online shops and social media sites. New community marketing solutions could help to find new markets and customers, as well as efficient solutions for communication with customers.

Another useful tool mentioned by stakeholders is the Modern Business Program, which provides field-based business consulting, IT screening, consulting for executives and decision-makers in rural areas, and helps to improve company development plans to get a Digitally Prepared Business qualification. Also, the Hungarian Chamber Of Commerce and Trade counseling and mentoring program provides great help for businesses.

Taking into account research results, **the main challenges of West-Transdanubian Region for promoting digitalisation of SMEs are related to improving digital literacy and skills, raising awareness of benefits for businesses brought by digitalisation, as well as development and use of digital services to replace paper documentation with online solutions.**

2.9. MALOPOLSKA, POLAND⁷⁴

Małopolska (Lesser Poland) Voivodship is one of the smallest regions of Poland, but it has the 4th highest number of inhabitants. It is located in the Southern Poland and borders with Slovakia. The capital city of Małopolska is Kraków. On the NUTS2 level, Małopolska is a part of the Południowy Region and, therefore, most of the Eurostat data are provided on a regional (NUTS2) or a national level.

Territory of Malopolska – 15 183.0 km Population of Malopolska – 3.3 million (2016) GDP per capita (PPS per inhabitant; % of the EU28 average, NUTS2): EUR 17 800; 62% (2015) Percentage of the ICT sector from GDP, % - 3.05 (national level, Poland, 2014) Real growth rate (Gross Value Added, basic prices, NUTS2): 2.5 (2015) Total R&D expenditure (GERD, NUTS2, % of GDP): 1.38 (2014) Unemployment rate (NUTS2, %): 5.2 (2016) Percentage of workforce working in the ICT sector, % -2.0 (national level, Poland, 2014)
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Poland ranks the 23rd among the EU member states according to the DESI 2017. Poland has made progress in Human Capital, Use of Internet and Connectivity. Also, Poland improved performance in fast Internet take-up, use of mobile broadband and assignment of spectrum for mobile broadband. Poland's main challenges are the adoption of digital technologies by businesses and the development of digital public services.⁷⁵

According to the World Digital Competitiveness Ranking 2017⁷⁶, Poland ranks the 37th among 63 countries. The weakest performance is in the areas of regulatory framework⁷⁷ (47) and business agility⁷⁸ (45).

The ICT is an important sector of economy for Poland and Małopolska Voivodship. Around 70% of all major IT companies in Poland are outsourcing centres belonging to international companies, such as

⁷⁴ All demographic, economic, unemployment and R&D expenditure indicators are taken from the Eurostat Database Regional statistics (<http://ec.europa.eu/eurostat/data/database>) if not indicated otherwise. All ICT indicators are taken from Baseline Studies conducted by the SKILLS+ partners. The text is based on the information provided in the SKILLS+ partner's Baseline Study and author's own internet search.

⁷⁵ <https://ec.europa.eu/digital-single-market/en/news/digital-economy-and-society-index-desi-2017>

⁷⁶ https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

⁷⁷ Starting a business; Enforcing contracts; Immigration laws; Technological regulation; Scientific research legislation; Intellectual property rights

⁷⁸ Opportunities and threats; Innovative firms; Agility of companies; Use of big data and analytics; Knowledge transfer.

Microsoft, Google and Oracle, which makes Poland in a top nearshore IT outsourcing destination for Europe. Małopolska is a region with high concentration of companies of the ICT industry and it has the second highest employment in the ICT sector in Poland. Twenty-three big international ICT companies, such as IBM, Motorola, Nokia, etc., are located in the capital city of Małopolska – Krakow. Presence of universities and scientific institutions in the region ensure availability of a skilled labour force for local entrepreneurs. Favourable business environment, special economic zones, innovation and entrepreneurship support centres (i.e. technology parks) and cluster initiatives, such as the Digital Entertainment Cluster, provide necessary conditions for the business development. However, insufficient innovation potential, complicated regulations and difficulties in obtaining funding for high risk investment are major obstacles for business and digital development.

The following factors are crucial for the ICT development and digitalisation:

- widespread broadband Internet connectivity, i.e. access of inhabitants and enterprises to broadband infrastructure;
- high e-skills of inhabitants and employees, availability of IT professionals;
- availability of private and public e-services;
- favourable business environment supporting SME's innovation.

According to the opinion of stakeholders of MARR within the SKILLS+ project, the SME's competitiveness could be increased by exploiting the following ICT solutions:

- e-commerce;
- advanced CRM systems and CMS;
- cloud computing for businesses (access to developed IT infrastructure and advanced software) and for employees (remote work);
- online tools for monitoring the ICT investments in SMEs, which may help to identify the factors affected their development and barriers;
- ICT tools for processing large amounts of data "big (smart) data processing" used in data management and analysis;
- portals to track the latest advances in digital science (so-called "Digital science"); e-government, e-learning, e-inclusion, e-culture and e-health;
- advanced ICT applications and tools used in areas such as Smart cities, intelligent transport, energy security, climate change, digitalisation of cultural heritage, security of information;
- tools with open access for public data, such as: geographic information, statistics, business registers, environmental monitoring, education, health, science, cultural heritage, tourism, patent data, employment etc.

The National Development Strategy 2020 "Active Society, Competitive Economy, Efficient State" declares that increasing of the use of digital technologies is one of the main priorities. The achievement of this objective has been foreseen by the following actions:

- ensuring widespread access to the Internet (mainly by development of the broadband infrastructure; the Strategy will be fitted for spatial differentiation, i.e. NGN - next generation networks should be developed in big cities; thus, investment in the Internet infrastructure should be supported for rural areas, which is unprofitable for private investors);
- dissemination of the use of digital technologies (generally by promotion of e-services, especially for inhabitants above 50 years old and from rural areas; an important part will be the development of human e-skills by wide program of digital education of citizens; social campaigns to promote the digital economy; increasing awareness of potential users about the benefits arising from the use of Internet; and providing electronic solutions in the area of administration, health, education, justice, etc.),
- ensuring quality of digital content and services, which will be performed by developing e-administration services and opening digital public resources.

According to the Regional Innovation Strategy for Małopolska Region, 2014-2020⁷⁹, the ICT has been identified as the sector with the greatest potential for regional growth. This Strategy is defined as the Regional Intelligent Specialisation of Małopolska (RIS3). Priority axis No. 3 of Małopolska's RIS3

⁷⁹ <https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/policy-document/regional-innovation-strategy-malopolska-region-2014-2020>

focuses on the development of information society, including the development of the infrastructure, increasing the availability of e-services, as well as increasing digital content on the Internet. The main planned activities are the following:

- Measure F. The development of regional broadband network (mainly related to Regional New Generation Broadband Network);
- Measure G. The development of electronic services and interoperable digital platforms:
 - G.1. E-public services and electronic communication in public institutions,
 - G.2. Open standards and regional IT systems (mainly related to systems with spatial Information and cloud computing with data from public administration),
 - G.3. Modern ICT infrastructure for residents,
 - G.4. Multi-system access to information and services;
- Measure H. The development of digital content (mainly related to the development of digital content and data security).

The Government of Poland (Ministries of: Digital Affairs, Development, Finance, Health, Infrastructure & Construction and Family, Labour & Social Policy) are implementing the national level programme “Paperless & Cashless Poland”⁸⁰. The main idea of this Programme is to transfer the know-how from the private sector into the public sector projects targeting the digital transformation of the state.

There are some legal constraints or doubts of SMEs in changes in the law, especially connected with ongoing amendments of the Personal Data Protection Law of Poland, which has to be harmonised with the EU legislation⁸¹.

The ICT uptake by SMEs in Poland is limited by the access of broadband infrastructure in rural areas, limited skills of employees in the medium age (above 50 years old), consumers habits of using traditional services, shortage of funds (of SMEs and inhabitants), insufficient promotion of e-services, fear of online threats, as well as the lack of transparency and simplicity of using EU funding resources. At the same time, there are important initiatives to encourage citizens to use ICT in Poland. For example, citizens can get relief of the Personal Income Tax for using the Internet at home (costs of the access to Internet can be deducted from the Personal Income Tax in annual tax refunds for the two following years for each person).

Currently, the expansion of broadband infrastructure in rural areas is enhanced by the ERDF co-financing within the Measure 1.1 “Eliminating territorial differences in terms of access to high-speed broadband Internet” of the Operational Programme “Digital Poland” 2014-2020. Another objective is building the Next-Generation Access network in so called “white areas”, i.e. selected areas by public administration, where NGA infrastructure doesn’t exist and most likely will not be established within the next three years without public support. All Polish schools should be connected to this new NGA network. The Programme will also support the improvement of e-skills, including advancing the use of public on-line services.

The Regional Operational Programme for Malopolska Voivodship for 2014-2020 is generally focused on supporting improvements in seven smart (intelligent) regional specialisations: life sciences, sustainable energy, ICT (including multimedia), chemistry, manufacture of metals and metal products (except machinery and equipment), electrical engineering and machine industry, creative industries and leisure time. Moreover, improving e-skills of citizens and employees, including those excluded from the labour market is one of the objectives in the Programme. Regional Labour Office in Krakow is implementing the project “Career Direction” financed by this programme helping to improve key skills and competences of adults. Additionally, support for SMEs and their employees for improving skills and trainings and coaching in different fields, including ICT, is offered by Malopolska Regional Development Agency (MARR) within the Programme from EU funds.

New solutions and opportunities for SMEs are also available in the framework of the Polish national Operational Programme “Smart Growth” for 2014-2020, which is mainly focusing on promoting the R&D development and internationalization of Polish SMEs.

Taking into account research results **main challenges of Malopolska for promoting digitalisation of SMEs are related to the development and use of digital services, enhancing e-skills of**

⁸⁰https://www.flandersinvestmentandtrade.com/export/sites/trade/files/attachments/paperless_cashless_poland_program_overview.pdf

⁸¹ Last project is prepared on 13th September 2017.

citizens and enterprises, improving ICT infrastructure in rural areas, as well as improving the overall business environment and related legislation.

2.10. POHJOIS-JA ITA SUOMI, KAINUU, FINLAND⁸²

Kainuu Region is a part of the territory of Pohjois-ja Ita Suomi. Kainuu is located in the Eastern part of Finland and it borders with the Russian Federation. Because of a low population density (3,7persons/ km²) Kainuu is considered as a rural area with businesses operating in a rural environment with small local markets. The Nordic cooperation plays a great role in the innovation and digitalisation processes of Finland taking into account long standing cooperation experience and the fact that the Nordic countries⁸³ (Denmark, Norway Finland and Sweden) have the highest DESI rankings (2017).

Territory: Pohjois-ja Ita Suomi – 227 150.0 km²; Kainuu – 20 197 km²
Population: Pohjois-ja Ita Suomi –1.3 million (2016); Kainuu – 74 803 (2017)
GDP per capita (PPS per inhabitant; % of the EU28 average, NUTS2): EUR 25 800; 90% (2015)
Percentage of the ICT sector from GDP, % - 4.34 (2013, national level, Finland)
Real growth rate (Gross Value Added, basic prices, NUTS2): (-0.6) (2015)
Total R&D expenditure (GERD, NUTS2, % of GDP): 3.08 (2013)
Unemployment rate (NUTS2, %): 10.2 (2016)
Percentage of workforce working in the ICT sector, % - 3.73 (2013, national level, Finland)

Finland ranks 3rd in DESI 2017 (right) after Denmark and Norway. Finland is among the most digital countries worldwide. It scores very well in four out of five dimensions, with a particular strength in digital skills where it is ahead of all other Member States. Finland is also very strong in digital public services.⁸⁴

According to the World Digital Competitiveness Ranking (WDCR) 2017⁸⁵, Finland ranks the 4th among 63 countries. In terms of WDCR, Finland is the best performing among the SKILLS+ partner states. Still, some drawbacks exist in the areas of business agility⁸⁶ (17) and scientific concentration (12)⁸⁷.

According to the SKILLS+ partner report, the priorities of developing the Information Society (IS) of Finland are related to 1) social services provision; and 2) enhancement of business environment to serve needs of a global and competitive economy. In 2013, the Finnish Government announced the first common strategy (between state and municipal/regional players) to address challenges of a public sector ICT utilisation⁸⁸. After that, in 2016, a new round of a nation-wide projects were announced⁸⁹ including the National Income Register (launched in 2015); licensing and supervision; chemicals control; self-care and digital value services; housing share register; software robotics in the service centre for financial and human resources management; one stop shop service model. For the digitalisation of new processes, the following projects have been launched: use of the spatial data on

⁸² All demographic, economic, unemployment and R&D expenditure indicators are taken from the Eurostat Database Regional statistics (<http://ec.europa.eu/eurostat/data/database>) if not indicated otherwise. All ICT indicators are taken from Baseline Studies conducted by the SKILLS+ partners. The text is based on the information provided in the SKILLS+ partner's Baseline Study and author's own internet search.

⁸³ Nordic countries are Denmark, Finland, Iceland, Norway, Sweden, however, Iceland isn't included in the DESI.

⁸⁴ <https://ec.europa.eu/digital-single-market/en/news/digital-economy-and-society-index-desi-2017>

⁸⁵ https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

⁸⁶ Opportunities and threats; Innovative firms; Agility of companies; Use of big data and analytics; Knowledge transfer.

⁸⁷ Total expenditure of R&D (%); Total R&D personnel per capita; Female researchers; R&D productivity by publication; Scientific and technical employment; High-tech patent grants.

⁸⁸ http://vm.fi/en/article/-/asset_publisher/first-common-strategy-to-address-challenges-in-public-sector-ICT-utilisation

⁸⁹ <http://vm.fi/en/digitalisation-of-processes>

services and supervision; development of automated financial management processes and reporting systems; development of government procurement activities; expanding the range of electronic signature; measures addressing the digital integration of the Finnish government, and measures for the development of ICT industry.

The ICT is one of the RIS3 priorities of the Kainuu Region and the digitalisation is a part of high tech industries of the regional strategy. The ICT development is noted within the sub-sectors of measurement technology, data centres and games, and simulators. In addition, the ICT is noted as a key enabling factor for other industries such as the wood industry and forestry.

The national policies of Finland related to the digitalisation are set out in the special Governmental Program 2015-2019⁹⁰, which specifies targets for digitalisation of public services and creation of a growth platform for the digital business environment. At the same time, the Regional Program of Kainuu 2014 – 2017, defines the digitalisation as an enabling technology to reach strategic goals.

The low population density makes it challenging to build networks to ensure connectivity for the whole Kainuu area. The region has greatly benefitted from the Governmental initiative “Laajakaista Kaikille” (2008), which supported the building of optical fibre network in areas, where it was not commercially sustainable. Today, in terms of the broadband coverage and usage of the mobile broadband network – Kainuu rates among the top regions of Finland. The affordable pricing and unlimited data usage makes it a very lucrative choice for households. Still, there are some demographic groups which are unable to benefit from the digital society, in particular the elderly. Also, there are SMEs which are not using e-mail and Internet. More than 60% of SMEs consider that their products or services aren't suitable for online business, which could be a matter of not understanding opportunities of the digital market. In addition, the domestic market is too small for exploiting the full potential of the DSM.

According to the SKILLS+ partner report, the greatest challenges for SMEs digitalisation in Kainuu are related to understanding the advantages provided by digitalisation. The lack of skills, costs of technologies, as well as demand for digital services in the region, need to be easily applicable and cost efficient to be used by society and businesses.

The ICT sector in Kainuu is mainly comprised by SMEs and micro-enterprises providing software solutions for businesses. One of priority areas of the region is attracting FDI for establishing data centres. There are few companies providing b2c and b2b ICT services and some software development companies mainly involved in subcontracting. The regional telephone co-operative has played a big role in providing connectivity and server infrastructure. Since the Kainuu University of Applied Sciences offers education in the gaming software development, this emerging sector has a good development potential – more than 50 companies have registered in this sector over the past 5 years.

Finland has national level programmes, such as Digiboosti, to improve the digitalisation, which offers support for SMEs to employ ICT professionals for increasing the innovation potential of a company.

On the regional level (Kainuu) there are three ongoing projects supporting innovation and use of digital tools in SMEs:

- ❖ DiHyTe project is implemented in co-operation with the regional social and health authority. It is based on the public and private partnership aiming at improving such services as medical consultations, offered to inhabitants of rural areas;
- ❖ Kasvua Kainuuseen is the main project supporting the development of individual SMEs throughout their life-cycle by providing necessary trainings, including digitalisation;
- ❖ RuralDigiServ project targets farmers and rural entrepreneurs helping to increase their understanding about the advantages offered by digital tools.

⁹⁰http://valtioneuvosto.fi/documents/10184/1427398/Ratkaisujen+Suomi_EN_YHDISTETTY_netti.pdf/8d2e1a66-e24a-4073-8303-ee3127fbfcac

Taking into account research results, the main challenges of the Kainuu region for promoting digitalisation of SMEs are related to raising awareness of population and SMEs about making the use of online services demand driven and exploiting advantages of digitalisation on a greater scale.

2.11. TRØNDELAG, SØR TRØNDELAG, NORWAY⁹¹

Sør-Trøndelag County comprises the southern part of the [Trøndelag](#) region of [Norway](#). The region has a coastline of the Norwegian Sea on the Western side and it borders with [Jämtland](#) of [Sweden](#) on the Eastern side. The Norwegian Parliament has decided to merge Sør-Trøndelag with Nord-Trøndelag and from 1 January 2018 to have a new region – Trøndelag⁹². Most of Sør-Trøndelag's inhabitants live in Trondheim and the surroundings. The region is rich with natural resources encompassing both, mountain areas and coastal landscapes. The fishing industry is Norway's second largest export industry, after oil and gas, where Trøndelag plays a key role.

Territory of Trøndelag – 41 254.0 km
 Population of Trøndelag – 449,457 thousand (2016)
 GDP per capita (PPS per inhabitant; % of the EU28 average, NUTS2): EUR 34 400; 125% (2015)
 Percentage of the ICT sector from GDP, % - 3.4 (regional level, 2014)
 Total R&D expenditure (GERD, NUTS2, % of GDP): 4.77 (2013)
 Unemployment rate (NUTS2, %): 4.0 (2016); 3.0 (Sør-Trøndelag, 2016)
 Percentage of workforce working in the ICT sector, % - 2.6 (regional level, 2015)

Norway is among the most digital countries of Europe according to the DESI (2017), where it ranks 2nd right after Denmark. Norway scores very well in broadband connectivity, Internet use, business digitalisation and digital public services. Norway is also above average on digital skills.⁹³

According to the World Digital Competitiveness Ranking 2017⁹⁴, Norway ranks the 10th among 63 countries. Main problem areas are scientific concentration⁹⁵ (22), business agility⁹⁶ (20) and talent.⁹⁷ (20). At the same time, Norway performs the best among SKILLS+ countries in the areas of capital⁹⁸ (7) and technological⁹⁹ (3).

Digital innovation and development is a priority of the Sør-Trøndelag policymaking. The ICT and/or digitalisation are mentioned in a number of the Sør-Trøndelag County policy documents. The main strategic tool for facilitating the digital development and innovation for both, public and private sectors, is the eTrøndelag unit¹⁰⁰, which is an operative entity of the County Authority Department for Regional Development's branch Innovation and Business Development. Taking into account a planned merger of Nord- and Sør-Trøndelag County Authorities in 2018 into Trøndelag County Authority, it has been announced that the digital perspective is going to be a main perspective in the new strategies for regional development in Trøndelag¹⁰⁰.

⁹¹ All demographic, economic, unemployment and R&D expenditure indicators are taken from the Eurostat Database Regional statistics (<http://ec.europa.eu/eurostat/data/database>) if not indicated otherwise. All ICT indicators are taken from Baseline Studies conducted by the SKILLS+ partners. The text is based on the information provided in the SKILLS+ partner's Baseline Study and author's own internet search.

⁹² Most of statistics of the Eurostat are already provided for Trøndelag region, which is considered on NUTS2 level.

⁹³ <https://ec.europa.eu/digital-single-market/en/scoreboard/norway>

⁹⁴ https://www.imd.org/globalassets/wcc/docs/release-2017/world_digital_competitiveness_yearbook_2017.pdf

⁹⁵ Total expenditure of R&D (%); Total R&D personnel per capita; Female researchers; R&D productivity by publication; Scientific and technical employment; High-tech patent grants.

⁹⁶ Opportunities and threats; Innovative firms; Agility of companies; Use of big data and analytics; Knowledge transfer.

⁹⁷ Educational assessment PISA – Math; international experience; foreign highly-skilled personnel; management of cities; digital/technological skills; net flow of international students

⁹⁸ IT & media stock market capitalization; funding for technological development; banking and financial services; investment risk; venture capital; investment in telecommunication

⁹⁹ Communications technology; mobile broadband subscribers; wireless broadband; internet users; internet bandwidth speed; high-tech exports (%)

¹⁰⁰ www.etrondelag.wordpress.com

The Norwegian digital policy's focus on the public sector digitalisation is reflected in the "Digital agenda of Norway – ICT for a simpler everyday life and increased productivity"¹⁰¹. The purpose of this publication is to explain how the Government's policy facilitates the use of ICT for the benefit of society. Digitalisation in the Norwegian policy is considered as a cross-sectoral issue. The Digital Agenda for Norway is inspired by the Digital Agenda for Europe. Norway not being an EU member state, it does not have the Smart Specialization Strategy.

While the Digital Agenda for Norway is mainly focusing on public sector digitalisation, the NOU 2016: "3 At a turning point: From resource economy to knowledge economy 2nd report from the Commission of Productivity"¹⁰² describes challenges and opportunities brought by a new digital economy for the business sector.

In 2017, the Norwegian Government launched a new white paper named "The Industry – greener, smarter and more innovative"¹⁰³. This document provides guidelines for the digitalisation process of Norway "Digital21", which aims at developing a unifying strategy for all industries and setting up common objectives and actions. This document is related to the Innovation Norway – the Norwegian Government's most important instrument for the innovation and development of Norwegian enterprises and industry.

There is a national level framework for the promotion of digital economy in Norway¹⁰⁴. The main responsible Governmental authorities are the Ministry of Local Government and Modernisation and the Ministry of Trade, Industry and Fisheries. The County Authorities regional development funds are also important tools. The most important non-governmental actors are the Norwegian Employers' organization and the organization uniting municipalities and county authorities.

The most important ICT and digital development in Trøndelag are the following:

- ✓ On 2006 Trådløse Trondheim (Wireless Trondheim) project was officially launched providing expanded access of the Internet for citizens. This project made Trondheim in one of the Europe's first wireless cities. Today Trøndelag's energy companies play an important role for both, delivering digital infrastructure and developing new technologies.
- ✓ One of the most important technologies developed in Trondheim was the GSM-technology that replaced the established standard for mobile phones (NMT 900).
- ✓ Established strong research environment for health services involving the university (NTNU) and the public St. Olavs hospital in Trondheim, as well as international companies, such as GE Healthcare and Siemens. Trøndelag has done one of the largest health studies ever performed and developed a database of medical histories collected through three intensive studies. Trondheim hosts the national Norwegian Health Network supervised by the Norwegian Ministry of Health and Care services. According to the Digital Agenda of Norway, it has launched an online Portal of Health and Care Services, where people can find their prescriptions, vaccines, patient records, etc. Trøndelag is also actively working on developing health technologies.
- ✓ Trondheim with the NTNU has developed a strong R&D environment. It also promotes entrepreneurship and the design thinking. Trondheim hosts several design start-ups, as well as Norway's leading design agencies, such as EggsDesign; Assistept; and Blueeye Robotics.

Today, service innovation, business modelling and organisational development are among the main challenges of digitalisation taking into account that previously the digitisation has been mainly focusing on technologies. SMEs need to have new competences and skills to innovate and develop more competitive services and organisations on national/international level. A key challenge for rural SMEs is low digital management skills, as well as skills to visualise future demand based on technological possibilities to innovate and employ human resources to deal with these challenges. A fact that Norway is a high-costs country makes it more complicated for SME's to take up modern ICT. Another obstacle is a lack of digital strategies for individual enterprises.

¹⁰¹ <https://www.regjeringen.no/no/dokumenter/digital-agenda-for-norway-in-brief/id2499897/>

¹⁰² <https://www.regjeringen.no/no/dokumenter/nou-2016-3/id2474809/sec1>

¹⁰³ <https://www.regjeringen.no/no/dokumenter/meld.-st.-27-20162017/id2546209/>

¹⁰⁴ <https://www.regjeringen.no/en/id4/>

Taking into account the research results, **the main challenges of Trøndelag for promoting digitalisation of SMEs are related to problems of SMEs to hire highly skilled ICT professionals, lack of specific skills important for improving international competitiveness, and absence of individual digital strategies for enterprises.**

3. POLICY ASSESSMENT

3.1. AN OVERVIEW OF DIGITAL POLICIES AND AGENDAS

All SKILLS+ partners, except Norway, have Smart Specialization Strategies on a national level and in a case of six out of eleven partners (Saxony-Anhalt, Western Macedonia, Castilla y Leon, Pannon Novum, Malopolska, and Kainuu) also on the regional level. In all cases, the ICT is one of the focus areas of Smart Specialization Strategies included as a separate priority or as a cross-sectoral priority. Please see Table 5 below.

3.2. SKILLS+ Partners Smart Specialisation Strategies

Table 5. Skills+ partners Smart Specialization Strategies (RIS3)

Region/country	ICT/RIS3	Website address
Sofia, Bulgaria	The priority of ICT development and digitalisation is included in the Innovation Strategy for Smart Specialization 2014-2020. (national level)	https://www.mi.government.bg/en/themes/innovation-strategy-for-smart-specialization-of-the-republic-of-bulgaria-2014-2020-is3-1470-287.html
Ostrava, Czech	The priority of ICT development and digitalisation is included in the Innovation Strategy for Smart Specialization, RIS3, 2014-2020 (national level)	http://www.onlines3.eu/wp-content/uploads/RIS3_strategy_repository/CZ_National-RIS3-strategy-approved-by-the-government-december-2014.pdf
Saxony-Anhalt, Germany	The ICT is the central theme and integral part of the Smart Specialisation Strategy Sachsen-Anhalt 2014-2020 (regional level)	http://www.onlines3.eu/wp-content/uploads/RIS3_strategy_repository/D_Sachsen_Anhalt_Regionale_Innovationsstrategie_2014-2020_final.pdf (in German) https://mw.sachsen-anhalt.de/fileadmin/Bibliothek/Politik_und_Verwaltung/MW/Publikationen/RIS/Regional_Innovation_Strategy_Sachsen-Anhalt.pdf
Western Macedonia, Greece	The priority of ICT development and digitalisation is included in the Innovation Strategy for Smart Specialization, RIS3, of the Region of Western Macedonia, 2014-2020 (regional level)	https://rio.jrc.ec.europa.eu/en/library/regional-smart-specialisation-strategy-western-macedonia http://www.pepdym.gr/upload/5pep/07/ris319062015.pdf
Castilla y Leon, Spain	The RIS3 of Castilla y Leon Region (2014-2020) addresses digital economy and information society as cross cutting issues being the regional R&D and Information Society's planning document (regional level)	http://www.onlines3.eu/wp-content/uploads/RIS3_strategy_repository/ES_CYL_RIS3_20140630.pdf

Zadar, Croatia	The priority of ICT development and digitalisation is included in the Innovation Strategy for Smart Specialization, RIS3, 2016-2020. (national level)	https://rio.jrc.ec.europa.eu/en/library/smart-specialisation-strategy-republic-croatia-period-2016-2020-and-action-plan
Latvia	The priority of ICT development and digitalisation is included in the Innovation Strategy for Smart Specialization, RIS3, 2014-2020, as a cross-cutting issue. (national level).	http://www.izm.gov.lv/en/Science/smart-specialisation-strategy http://www.onlines3.eu/wp-content/uploads/RIS3_strategy_repository/LV_20130327_The_initial_position_of_Latvia_on_Innovation_and_SSS.pdf http://www.onlines3.eu/wp-content/uploads/RIS3_strategy_repository/LV_The_Informative_Report_Development_of_RIS3.pdf
Pannon Novum West-Transdanubia, Hungary	RIS3 – Intelligent Specialization Strategy of Western Transdanubia (regional level) National Smart Specialization Strategy of Hungary	Regional level: www.pannonnovum.hu/webimages/files/S3_NYUDU_egyztetési_valtozat_ki.pdf National level: http://nkfih.gov.hu/szakpolitika-strategia/national-smart
Malopolska, Poland	The priority of ICT development and digitalisation is included in the Innovation Strategy for Smart Specialization, RIS3 of Malopolska Region, 2014-2020. (regional level)	http://www.onlines3.eu/wp-content/uploads/RIS3_strategy_repository/PL_Malopolskiego_RSI.pdf
Kainuun Etu, Finland	The priority of ICT development and digitalisation is included in the Innovation Strategy for Smart Specialization, RIS3, 2014-2020, of Kainuu Region (regional level)	http://s3platform.jrc.ec.europa.eu/regions/FI1D4/tags/FI1D4
Sør Trøndelag, Norway	RIS3 doesn't exist in Norway.	n/a

Source: SKILLS+ Baseline studies

All SKILLS+ partner countries and regions have various national and/or regional level documents related to the ICT uptake and digitalisation. The fact that many of documents are available on local languages only doesn't allow to conduct any comparison between partner countries and/or regions. The information on the national and regional policy documents provided in Table 6 depend on the information provided by the SKILLS+ partners.

Policy planning documents of all SKILLS+ partner countries are in line with the EU Digital Agenda. However, not all of partner countries and regions have their own national or regional level strategic digitalisation plans. National digitalisation plans exist in cases of Bulgaria, the Czech Republic, Germany, Saxony-Anhalt, Spain, Castilla y Leon, Croatia, Finland and Norway.

In all SKILLS+ partner countries/regions, which are EU member states, the ICT is a priority of the Operational Programmes 2014-2020, which tackle the ICT development for promoting the ICT uptake, information society and ICT infrastructure development under its second Thematic Objective with the support of EU Cohesion Funds (ERDF). Therefore, in the SKILLS+ project framework the Operational Programmes are the main policy instruments tackled by partners. Please see Table 6 below for further information.

Table 6. SKILLS+ partners' main national and regional level documents related to the ICT uptake and digitalisation.

Region/country	National level
Bulgaria	<ul style="list-style-type: none"> ✓ National Development Program Bulgaria 2020 - http://archive.eufunds.bg/en/page/873 ✓ National Broadband infrastructure Plan for Next Generation Access and roadmap for its implementation https://ec.europa.eu/digital-single-market/en/country-information-bulgaria ✓ National Strategy for Scientific Research 2020 http://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=684 ✓ National roadmap for research infrastructure https://ec.europa.eu/research/infrastructures/pdf/roadmaps/bulgaria_national_roadmap_2017_en.pdf#view=fit&pagemode=none ✓ National Strategy for the Promotion of Small and Medium Enterprises 2014-2020 https://www.mi.government.bg/en/themes/national-strategy-for-small-and-medium-sized-enterprises-2014-2020-small-business-act-11-285.html ✓ Digital Bulgaria 2020 National Programme and roadmap ✓ E-governance development strategy 2014-2020 in the Republic of Bulgaria https://www.mtitc.government.bg/en/informacionni-tehnologii/politiki/shirokolentov-dostup ✓ National strategy for development of broadband access in Republic of Bulgaria https://www.mtitc.government.bg/en/informacionni-tehnologii/politiki/shirokolentov-dostup/program-documents ✓ National Cyber Security Strategy "Cyber Resilient Bulgaria 2020" http://www.libreresearchgroup.org/en/a/the-national-cybersecurity-strategy-cyber-resilient-bulgaria-2020-was-adopted ✓ CONCEPT for Development and Render for Maintenance and Operation of Regional Broadband Access Networks in Less Urbanized and Rural Areas, Bulgaria 2010 https://www.mtitc.government.bg/en/informacionni-tehnologii/politiki/shirokolentov-dostup/concepts
The Czech Republic	<ul style="list-style-type: none"> ✓ The National ICT Development Plan (http://nova-ekonomika.cz/wp-content/uploads/2016/02/Stanovisko_NCDE1.pdf) - in Czech language ✓ The National Strategic of the Digital Security, 2015 - 2020 (https://ccdcoe.org/sites/default/files/strategy/CZE_NCSS_cz.pdf) - in Czech language
Germany	<ul style="list-style-type: none"> ✓ Digital Strategy 2025 http://www.bmwi.de/Redaktion/EN/Publikationen/digitale-strategie-2025.pdf?blob=publicationFile&v=3 ✓ Digital Agenda 2014-2017 (http://www.bmwi.de/Redaktion/EN/Downloads/digital-agenda-2014-2017.pdf?blob=publicationFile&v=1) ✓ The Action Programme on Digitalisation ("Aktionsprogramm Digitalisierung")
Saxony-Anhalt, Germany	<ul style="list-style-type: none"> ✓ ICT Strategy "Digital Saxony-Anhalt 2020" https://mf.sachsen-anhalt.de/fileadmin/Bibliothek/Politik_und_Verwaltung/MF/Dokumente/E_Government/IKT-Strategie_Sachsen-Anhalt_digital_2020.pdf (In German) ✓ Business and science 4.0 – measures and support programmes Saxony-Anhalt https://mw.sachsen-anhalt.de/fileadmin/Bibliothek/Politik_und_Verwaltung/MW/Publikationen/Wirtschaft_und_Wissenschaft_4.0_-_final.pdf (in German) ✓ Strategic facilitation of SMEs businesses of Saxony-Anhalt (in German) ✓ Smart Specialisation Strategy Sachsen-Anhalt 2014-2020 https://mw.sachsen-anhalt.de/fileadmin/Bibliothek/Politik_und_Verwaltung/MW/Publikationen/RIS/Regional_Innovation_Strategy_Sachsen-Anhalt.pdf ✓ Digitale Agenda https://digital.sachsen-anhalt.de/ (in German)
Greece	<ul style="list-style-type: none"> ✓ The Greek e-government strategy (2014-2020) https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/eGovernment%20in%20Greece%20-%20February%202016%20-%20v%2018_0_2_00.pdf ✓ Greek OP "Competitiveness - Entrepreneurship - Innovation of the National Strategic Reference Framework 2014-2020" http://ec.europa.eu/esf/main.jsp?catId=576&langId=en ✓ Operational Programme "Environment and Sustainable Development" Part A'- 2009: http://goo.gl/D240hZ

	<ul style="list-style-type: none"> ✓ Smart Specialization Strategies in Greece – expert team review for DG REGIO. "RIS3 Regional Assessment": http://www.urenio.org/wp-content/uploads/2013/04/RIS3-review-report-Western-Macedonia-final-edited-2012.pdf
Western Macedonia, Greece	<ul style="list-style-type: none"> ✓ Regional Operational Programme of Western Macedonia 2014-2020 http://ec.europa.eu/esf/main.jsp?catId=576&langId=en
Spain	<ul style="list-style-type: none"> ✓ Spanish Digital Agenda (ENG): http://www.agendadigital.gob.es/digital-agenda/Documents/digital-agenda-for-spain.pdf
Castilla y León, Spain	<ul style="list-style-type: none"> ✓ 2007-2013 Castilla y León Regional R&D Strategy” (ERIDI 2007-2013) (in Spanish): http://www.cienciaytecnologia.jcyl.es/web/jcyl/CienciaTecnologia/es/Plantilla100/1284333479395/_/_/ ✓ 2007-2013 “Castilla y León Regional Strategy for a Digital Knowledge Society” (ERSDI 2007-2013)(in Spanish) http://www.cienciaytecnologia.jcyl.es/web/jcyl/CienciaTecnologia/es/Plantilla100/1284395510387/_/_/ ✓ Castilla y León Digital Agenda (In Spanish): http://www.cienciaytecnologia.jcyl.es/web/jcyl/CienciaTecnologia/es/Plantilla100/1284395844610/_/_/ ✓ Plan PAHIS /CYL Historical Heritage Plan 2014-2020: http://www.patrimoniocultural.jcyl.es/web/jcyl/PatrimonioCultural/es/Plantilla100/1284407871843/_/_/
Croatia	<ul style="list-style-type: none"> ✓ E-Croatia strategy 2020 https://www.pravo.unizg.hr/download/repository/Strategija-e-Hrvatska_2020_(20.01.2016).pdf ✓ E-Government Action Plan 2016-2020 ✓ The National Information Infrastructure Act (OG 92/14): https://www.zakon.hr/z/736/Zakon-o-dr%C5%BEavnoj-informacijskoj-infrastrukturi ✓ National Program for Developing Broadband Infrastructure in the Areas Where There Isn't Sufficient Interest for Investment: http://www.mppi.hr/UserDocsImages/VRH-ONP-objava.pdf ✓ The Development of Internet and Broadband Internet Access in the Areas of a Special State Concern, Mountain Areas and Islands. (Program razvoja interneta i širokopojsnog pristupa internetu na područjima od posebne državne skrbi, brdsko-planinskim područjima i otocima): https://www.hakom.hr/UserDocsImages/2012/studije/Studija-Program%20razvoja%20BB.pdf ✓ Law on Digital Signature http://narodne-novine.nn.hr/clanci/sluzbeni/2003_10_173_2504.html ✓ Law on Online Commerce http://narodne-novine.nn.hr/clanci/sluzbeni/2005_12_150_2898.html ✓ Law on Electronic Documents http://narodne-novine.nn.hr/clanci/sluzbeni/2008_06_73_2420.html ✓ Regulations on Electronic Communication http://narodne-novine.nn.hr/clanci/sluzbeni/2007_07_79_2484.html ✓ Law on Information Security http://narodne-novine.nn.hr/clanci/sluzbeni/2007_07_79_2483.html ✓ Law on Classified Information http://narodne-novine.nn.hr/clanci/medunarodni/2002_07_9_119.html ✓ Law on Cybercrime
The Republic of Latvia	<ul style="list-style-type: none"> ✓ National Development Plan for 2014-2020 (ENG) ✓ Operational Programme „Growth and Employment 2014 - 2020” (ENG) ✓ The Information Society Development Guidelines for 2014 - 2020 (ENG) ✓ National industrial policy guidelines for 2014 to 2020 (LV) ✓ Science, Technology Development, and Innovation Framework 2014-2020 (LV) ✓ Concept for the development of the next generation broadband electronic communications network (LV)
Hungary	<ul style="list-style-type: none"> ✓ Executive summary of National Infocommunication Strategy (NIS) ✓ HU: http://nhit.hu/dokumentum/108/NIS_Vezetoi_osszefoglalo.pdf ✓ ENG: www.kormany.hu/download/5/ff/70000/NIS_EN_clear.pdf

	<ul style="list-style-type: none"> ✓ National Infocommunication Strategy (NIS) ✓ HU: http://okt.ekt.hu/data/szlahorek/file/kezek/05_ikt_02_27/422magyarorszag_infokommunikcis_stratgia_20142020ig.html ✓ ENG: www.kormany.hu/download/5/ff/70000/NIS_EN_clear.pdf ✓ Digital Hungary Programme ✓ HU: http://digitalismagyarorszag.kormany.hu/digitalis-magyarorszag ✓ ENG: - Economic Development and Innovation Operational Programme (GINOP) ✓ ENG: http://ec.europa.eu/regional_policy/en/atlas/programmes/ ✓ Economic Development and Innovation Operational Programme (GINOP) 3.2.2.- Supporting corporate complex information and mobile development, support for spreading cloud-based online business services
Poland	<ul style="list-style-type: none"> ✓ Poland 2030 "Long-term National Development Strategy 2030". Third Wave of Modernity" (LTNDS, adopted 5.02.2013). ✓ National Development Strategy 2020 "Active society, competitive economy, efficient state" (NDS 2020, adopted 25.09.2012): http://www.archiwum.mir.gov.pl/english/Regional_Development/Development_Policy/NDS_2020/Documents/NDS%202020.pdf ✓ National Broadband Plan 2020 (PL): https://mac.gov.pl/files/narodowy_plan_szerokopasmowy_-_08.01.2014_przyjety_przez_rm.pdf ✓ Efficient State Strategy 2020: http://administracja.mswia.gov.pl/download/58/16077/EfficientStateStrategy2020.pdf ✓ National Strategy of Regional Development 2010-2020. Regions, cities, rural areas: http://www.espon-usespon.eu/dane/web_usespon_library_files/672/national_strategy_of_regional_development_2010-2020.pdf ✓ National Reform Programme: http://ec.europa.eu/europe2020/pdf/nrp/nrp_poland_en.pdf ✓ Responsible Development Plan: https://www.mr.gov.pl/media/14873/Responsible_Development_Plan.pdf ✓ Operational Programme "Digital Poland" for 2014-2020: https://www.polskacyfrowa.gov.pl/media/10410/POPC_eng_1632015.pdf ✓ Operational Programme "Smart Growth" for 2014-2020: https://www.poir.gov.pl/media/6223/EN_POIR_zatwierdzony_przez_KE_23022015.pdf ✓ Operational Programme "Knowledge, Education, Development" for 2014-2020: https://www.power.gov.pl/media/10256/OPKED_zatwierdzony_przez_KE_en_calosc.docx
Malopolska, Poland	<ul style="list-style-type: none"> ✓ Regional Operational Programme For The Malopolska Region, 2014-2020: http://www.rpo.malopolska.pl/download/program-regionalny/o-programie/zapoznaj-sie-z-prawem-i-dokumentami/regional-operational-programme-for-the-malopolska-region-2014-2020/2016/08/RPOWM_EN.pdf
Finland	<ul style="list-style-type: none"> ✓ National policies related to digitalisation set in the Governmental program 2015 - 2019 (ENG) http://valtioneuvosto.fi/documents/10184/1427398/Ratkaisujen+Suomi_EN_YHDI-STETTY_netiti.pdf/8d2e1a66-e24a-4073-8303-ee3127fbfcac ✓ Updated National policy documents related to digitalisation (2016) http://valtioneuvosto.fi/documents/10184/321857/Toimintasuunnitelma+strategisen+hallitusohjelman+kärkihankkeiden+ja+reformien+toimeenpanemiseksi+2015-2019,+päivitys+2016/305dcb6c-c9f8-4aca-bbbb-1018cd7a1fd8 ✓ Key digitalisation projects (ENG): http://valtioneuvosto.fi/en/implementation-of-the-government-programme
Kainuu, Finland	<ul style="list-style-type: none"> ✓ Regional program of Kainuu 2014 – 2017 https://www.kainuunliitto.fi/sites/default/files/kainuu-ohjelma_julkaisupohjalle_03092015.pdf
Norway	<ul style="list-style-type: none"> ✓ Digital agenda for Norway – ICT for a simpler everyday life and increased productivity https://www.regjeringen.no/no/dokumenter/digital-agenda-for-norway-in-brief/id2499897/

	<ul style="list-style-type: none"> ✓ NOU 2016: 3 At a turning point: From resource economy to knowledge economy – the second report from the Commission of Productivity https://www.regjeringen.no/no/dokumenter/nou-2016-3/id2474809/sec1 ✓ Innovation Norway http://www.innovasjon Norge.no/en/start-page ✓ White paper “The Industry – greener, smarter and more innovative” (NW): https://www.regjeringen.no/no/dokumenter/meld.-st.-27-20162017/id2546209/
Sør Trøndelag, Norway	<ul style="list-style-type: none"> ✓ Strategiplan 2017-2020 (NW): https://www.stfk.no/Documents/Strategiplan/2017/Strategiplan_2017-2020_web.pdf ✓ Handlingsprogram for Innovasjon og verdiskaping Sør Trøndelag 2017 p 16/ Business Development Programme Sør-Trøndelag 2017 (NW): https://www.stfk.no/Documents/Nering/HandlingsprogramSTR2017.pdf ✓ Regional Plan 2015-2020 Klima og Energi Sør Trøndelag pp 18-19/Regional Plan for Climate and Energy 2015-2020 (NW): https://www.stfk.no/Documents/klima/Regional%20plan%20for%20klima%20og%20energi%202015-2020.pdf ✓ Regional Folkehelseplan for Sør-Trøndelag 2014-2018, p 49/Regional plan for Public health (NW): https://www.stfk.no/upload/A/2014/Folkehelse/Folkehelseplan%20sept%202014.pdf

Source: SKILLS+ partners Baseline Studies and author’s own internet search.

3.3. ASSESSMENT PROVIDED BY STAKEHOLDERS¹⁰⁵

During the research work SKILLS+ partners have identified regional stakeholder groups. According to the definition “A stakeholder is anybody who can affect or is affected by an organisation, strategy or project. They can be internal or external and they can be at senior or junior levels.”¹⁰⁶ (Please, see a full list of stakeholders in the Appendix 2. List of SKILLS+ stakeholders.)

More than 70 of regional stakeholders were interviewed by project partners during SKILLS+ expert interviews.

Questions used in expert interviews:

1. How do you evaluate the current use of digital technologies by SME in rural areas?
2. What are the main reasons for not using digital technologies by SME in rural areas?
3. Which digital technologies should be used more to boost the competitiveness of SME and why?
4. How do you evaluate the support structures and programmes in place to support SME wishing to “go digital”?
5. In your opinion, what kind of non-monetary support is necessary to achieve a higher share of SME using digital technologies in their business activities?

Summary of the expert interview results:

- ❖ Problems with broadband coverage, connectivity and insufficient infrastructure are among the main obstacles for digitalisation and competitiveness of SMEs in rural areas. This is often followed by the lack of qualified employees, digital competences and skills.

¹⁰⁵ Information in this chapter is based on interviews conducted by the SKILLS+ partners and described in their Baseline Studies.

¹⁰⁶ <http://www.stakeholdermap.com/stakeholder-definition.html>

- ❖ Digitalisation is considered as very important for competitiveness of SMEs. At the same time, SMEs are often complaining about shortage of funds and lack of investment for ICT technologies and digitalisation. Also, SMEs are often unwilling to invest in digitalisation as they don't acknowledge opportunities and benefits from using new technologies and applications. Companies mostly don't consider digitalisation as part of their strategy and business model. In many cases infrastructure of SMEs and technologies are outdated, only basic features are being used in daily business routines.
- ❖ Usage of the Internet, ICT applications and solutions is slowly increasing. Especially, young entrepreneurs and newly established enterprises are keen to explore and apply digital solutions for their companies.
- ❖ First of all, this is important to ensure that SMEs use so-called daily technologies - computer, mobile devices, the Internet to provide the opportunity for SMEs with the use of "basic" applications, such as e-mail, online banking, online payments, tax returns and annual reporting, etc. In addition, there are a lot of solutions and digital tools available for SMEs, such as e-government services, specific business applications, applications for management and production processes, cloud computing solutions, platforms for data exchange and others. Application of these solutions could free-up resources and reduce costs providing additional resources for companies to invest in modernization.
- ❖ Awareness raising and information campaigns, as well as dissemination of information are essential for encouraging SMEs for ICT and digital uptake. Seminars, training, consultations and help-desk are among the most required non-monetary support measures. Simplification of digital application and affordable, suitable and in some cases tailor made digital solutions and products for SMEs in rural areas would also be required. Cybersecurity is an issue of concern requiring constant attention.

Another task for regional stakeholders was to evaluate SKILLS+ selected good practices. SKILLS+ good practices are selected in 4 categories: 1) Facilitating organisational changes; 2) Fostering human skills development; 3) Promotion of ICT-based business opportunities; 4) None of the above. The same good practice can belong to several categories at the same time.

As a result of SKILLS+ partners' internal meetings with stakeholders almost all good practices were selected for deeper research by project partners for learning or taking over these practices in other project regions. (Please see Table 7.). According to results SKILLS+ partners' interests and needs are quite diverse. The greatest interest has been shown for good practices related to improvement of skills, awareness rising and SMEs capacity to take up ICT.

Table 7. Good Practices proposed and selected by the SKILLS+ partner regions.

No	Category	Region, country	Good practice, GP (title)	Region, country
	Facilitating organisational changes	Providing the GP		Choosing the GP
1		Kainuu, FINLAND	Digital Service Tray (DST)	Castilla y Leon, Spain; Saxony-Anhalt, Germany
2		Castilla y Leon, SPAIN	Innochambers	Sofia, Bulgaria; Małopolska, Poland
3		Małopolska, POLAND	Diversification into non-agricultural activities and Creation and development of SMEs	Castilla y Leon, Spain; Latvia
4		West Transdanubia, HUNGARY	Modern Businesses Program	Małopolska, Poland
5		Zadar, CROATIA	Innovative Zadar	

6		Sofia, BULGARIA	Support for commercialization of innovative products, processes and providing innovative service	Saxony-Anhalt, Germany
7		Sofia, BULGARIA	Technological modernization of SMEs	
8		Saxony-Anhalt, GERMANY	Strategic facilitation of SMEs businesses of Saxony-Anhalt	Western Macedonia, Greece; Sofia, Bulgaria; Castilla y Leon, Spain;
9		Saxony-Anhalt, GERMANY	ICT-strategy "Digital Saxony-Anhalt 2020"	Castilla y Leon, Spain; Sør-Trøndelag, Norway
10		Saxony-Anhalt, GERMANY	Smart Specialisation Strategy Sachsen-Anhalt 2014-2020	Western Macedonia, Greece; Sofia, Bulgaria;
	Fostering human skills development			
1		Kainuu, FINLAND	RuralDigiserv, Pro Agria	
2		Kainuu FINLAND	DARRA – Digital Age for Rural and Remote Areas	Zadar, Croatia; Saxony-Anhalt, Germany
3		LATVIA	E-leadership skills for SMEs	Zadar, Croatia; Saxony-Anhalt, Germany, West Transdanubia, Hungary
4		LATVIA	Ventspils Digital Centre, VDC	Małopolska, Poland
5		Western, Macedonia, GREECE	Training, certification and consulting for unemployed young people aged 18-24, in the area of ICT	Latvia; Saxony-Anhalt, Germany
6		Castilla y Leon, SPAIN	Laboratory of social innovation	Sofia, Bulgaria; Saxony-Anhalt, Germany
7		Sør-Trøndelag, NORWAY	ST-Online	Sofia, Bulgaria; Latvia Zadar, Croatia; Western Macedonia, Greece;
8		Małopolska, POLAND	Małopolska education cloud	
9		Małopolska, POLAND	Improving the competencies of adults in ICT and foreign language skills of the Human Capital	Kainuu, Finland; Ostrava, Czech Republic; Saxony-Anhalt, Germany
10		Małopolska, POLAND	Intelligent management system of digital competence “e-Skills”	Castilla y Leon, Spain; Ostrava, Czech Republic
11		West Transdanubia, HUNGARY	IMPROVEMENT OF MODERN BUSINESS ENVIRONMENT	
	Promotion of ICT-based business opportunities			
1		Kainuu, FINLAND	GOLLI (Global Orders, Logistics Labels & Information)	Małopolska, Poland; Saxony-Anhalt, Germany
2		Kainuu, FINLAND	DIGIBOOSTI	Małopolska, Poland; Sør-Trøndelag, Norway; Latvia; Saxony-Anhalt, Germany
3		Saxony-Anhalt, GERMANY	IT Cluster of Central Germany	Kainuu, Finland; Małopolska, Poland; Ostrava, Czech Republic
4		Saxony-Anhalt, GERMANY	e-business-pilot Magdeburg	West Transdanubia, Hungary
5		Saxony-Anhalt,	HalberStadt-app mobile web- and	

		GERMANY	app-based information portal	
6		LATVIA	Information Campaign: “ e-Skills Week for Jobs”	Western Macedonia, Greece; Saxony-Anhalt, Germany
7		LATVIA	Latvian IT Cluster, LITC	Sofia, Bulgaria;
8		LATVIA	Open Innovation Platform "Demola Latvia"	Sør-Trøndelag, Norway
9		Western Macedonia, GREECE	DIGI-LODGE. “Aid for accommodation establishments, to create websites and computer reservation systems”	
10		Western Macedonia, GREECE	Wines of Crete - A portal that brings together the place, the wines and visitors	Castilla y Leon, Spain;
11		Castilla y Leon, SPAIN	RURAL SME AND CULTURAL HERITAGE	
12		Sør-Trøndelag, NORWAY	Cultourist	Castilla y Leon, Spain; West Transdanubia, Hungary
13		Małopolska, POLAND	Support for economic activity as regards electronic economy	
14		Małopolska, POLAND	Support for implementation of electronic business – B2B	
15		West Transdanubia, HUNGARY	I3CT Crossborder Clustering project	
16		Ostrava, CZECH REPUBLIC	Support of cooperation between SMEs and Universities	
17		Ostrava, CZECH REPUBLIC	Technological transfer from Universities to SMEs	Saxony-Anhalt, Germany
18		Zadar, CROATIA	E-business Competitiveness Improvement Project	Latvia; Saxony-Anhalt, Germany
19		Sofia, BULGARIA	Development of managerial capacity and growth of SMEs	Saxony-Anhalt, Germany
20		Sofia, BULGARIA	Sofia Tech Park	Sør-Trøndelag, Norway
21		LATVIA	Network of State and Municipal Unified Customer Service Centres.	Castilla y Leon, Spain;
22		Zadar, CROATIA	E-BUSINESS	
	None of the above			
1		Sør-Trøndelag,, NORWAY	E-Trondelag	Kainuu, Finland
2		Ostrava, CZECH REPUBLIC	Flexibility of ERDF progamme and simplification of system administration	

Source: SKILLS+ partners' Baseline Studies.

4. CONCLUSIONS

The macroeconomic and DSM data analysis indicates that the situation in SKILLS+ partner countries and regions is quite diverse. On the positive side, most of observed indicators, except using the Internet for selling goods and services, and using Internet for interacting with public authorities, have been improving in all SKILLS+ partner regions. The indicators reflect improvements in infrastructure and increasing access to the broadband, which have helped to increase a number of households having Internet access at home and increased the use of computers and other devices, as well as the Internet.

On the other hand, use of the Internet in 2016 was above 50% only in cases of six of eleven SKILLS+ partner regions. Also, by 2015, there were still quite many individuals who had never used a computer. Except Trøndelag, Norway (1%), Pohjois- ja Itä-Suomi, Finland (6%) and Sachsen-Anhalt (9%) in cases of all other partners this indicator of non-users reached from 14% to 32%. This can be explained by the lack of access to computers or low computer literacy, however, further investigation would be needed to identify reasons for not using the Internet.

By 2016, the use of internet banking was still critically low in cases of several partner regions. And the use of the Internet for selling goods or services was too low and volatile in most of the SKILLS+ partners regions. Low use of online sales, as well as online shopping, could be partly related to a low use of internet banking in cases of Bulgaria and Greece, but isn't true for Latvia, where the internet banking is being used quite actively. Factors related to the low use of internet banking and also low internet sales are very important for improving business activity and competitiveness of SMEs.

The statistics (2012-2016) show that there were more individuals ordering goods or services on the Internet than those, who were selling. Increase in internet sales has been too slow and volatile over the period. This also means that there are great opportunities for those SMEs, which will consider to start online selling.

A number of those, who were using the Internet for the interaction with public authorities, has been slowly increasing, except for Yugožapadenand, Bulgaria, where the interactions with public authorities has been decreasing over the time period from 2012 to 2016, which is quite alarming also for the business development.

The SWOT analysis conducted by the SKILLS+ partners confirms and extends the results of statistical analysis and DSM indicators. There are common challenges for all SKILLS+ partners mainly related to the development of broadband and Internet access, especially in remote areas; readiness of enterprises and governmental organizations to adapt to rapidly changing digital environment, technologies and global trends; demographic challenges related to aging population and migration; availability of skills, competences and knowledge using ICT and digital tools; accessibility of financing for continuing development of infrastructure and technological upgrade, as well as cyber security.

There are still a lot of challenges ahead before the digital gap between SKILLS+ partner regions will be closed. Using the opportunities provided by the SKILLS+ project this could be very useful for the partner regions lacking, for example digital skills (Bulgaria, Greece, Latvia) to learn from their most advanced partners according to DESI index (Norway, Finland, Germany). In addition the learning process should take a place by taking over relevant good practices and experiences of other project partners as indicated in the SKILLS+ Baseline Studies.

Taking into account that not all of the SKILLS+ partner countries and regions have adopted their digitalisation strategies this would be recommendable to work them out on the national and also on regional levels. Also, the lack of individual digitalisation strategies for individual enterprises is an obstacle for digitalisation.

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Appendix 1. SWOT analysis of SKILLS+ partner regions.

	Strengths	Weaknesses
Latvia	93% of households have access to broadband Internet; one of the fastest Internet connections in the World; share of population using e-government services is gradually increasing; computer and Internet is used by 100% of large SMEs and 98.6% of small companies; government support programmes for SMEs and e-skills development; good infrastructure; developed private e-services.	Number of inhabitants who use the Internet to purchase goods from other countries is still low; 16% of Latvia's citizens have never used the Internet; only 2% of the workforce are ICT specialists; only 10.2% of SMEs sell online; digital skills are still on a comparatively low level; little use of cloud computing.
Sofia (Bulgaria)	High level of broadband coverage and high-speed broadband connections; high penetration of broadband access of at least 30 Mbps; high level of broadband Internet access of enterprises; accelerated pace of development of e-government services; high level of usage of e-government services by businesses; increasing multinational investments in the ICT sector.	Uneven broadband coverage (regional imbalances) with low penetration of broadband access in remote, sparsely populated and rural areas ; small number of public e-services which are offered only online; low level of usage of ICT by SMEs in other industrial sectors; low level of investment in ICT by enterprises; comparatively low level of e-commerce development.
Zadar (Croatia)	Increasing number of computer literacy; low costs for internet service; increasing DESI indicator; sufficient number of ICT specialists; good quality of life; many R&D institutions; lifestyle; tax incentives	Lack of broadband connections; ICT sector isn't among government priorities; habits of rural SMEs; traditional sales channels; stagnation of domestic market; lack of foreign investment; scarcity of information; low purchasing power of citizens.
Sachsen-Anhalt (Germany)	Recognition of the importance of digitalisation by SMEs; integration of ICT tools by lead markets like automotive, logistics and engineering; digitally skilled employees; promotion of training and development of staff and university students; integration of staff in business processes; applying e-business pilots; promoting digital skills and expertise as a factor of competitiveness; good sectoral networks and exchange of knowledge; improvement of business processes; outsourcing of digital business models; integration of specialized ICT partners and external expertise; increasing on-line sales and development of online shops.	Missing digital agendas/strategies for SMEs; non-existent strategic approach for Industry 4.0; lack of vision and unclear corporate goals; lack of IT specialists; complicated recruitment of staff due to low pay and lack of career opportunities in SMEs; monopolisation of knowledge within enterprises; lack of knowledge and own IT units in enterprises; low understanding of technology; limited communication and information; lack of staff integration; lack of interdisciplinary approach; lack of market knowledge, advice and support; lack of digital business models; low degree of process digitalisation; manual processes, high effort; no relation between production and digitalisation; old traditional structures and procedure; low degree of investments and innovation; low access to broadband, especially in rural areas; costs of digitalisation process are considered too high; uncertainty concerning costs-benefit-ratio; uncertainty about necessity to invest in research; fear that digitalisation would put jobs at risk; pressure to innovate.
Pannonia (Hungary)	Strong development of digital competences across the entire framework of education; ICT sector is one of priorities of the R+D+I strategy adopted by the government; high share of the ICT in GDP; near full internet penetration in public administration sector.	The ICT sector is primarily represented by local subsidiaries of multinational companies engaged in assembly activities; companies aren't taking full advantage of opportunities provided by Internet and technologies; SMEs online presence is insufficient (e.g., website).
Kainuu (Finland)	Well-developed infrastructure; high use of internet; strong ability to use digital services in age group 16-75.	Slow development of online businesses; low value-added from digital tools; lack of knowledge-intensive business services; lack of digital skills in some SMEs.

Ostrava (Czech Republic)	Development of high-quality research institutes and universities with high innovation potential; successfully developing ICT sector; cooperation networks and clusters supporting collaboration between public, academic and private sectors; presence of a large technical university VSB-TU with a high potential for applied research and the newly built research infrastructure (research centres supported by the OP R&D); high share of private investment in R&D.	Weak economic performance; insufficiently enforced development strategy for the region; lack of competent and skilled workforce; mismatch between skills and needs of labour market; non-existent systemic and conceptual support of entrepreneurship, including start-ups and small businesses; lack of interregional cooperation.
West Macedonia (Greece)	Qualified human resources; quality products of the primary sector; presence of the higher education institution with the Department of Informatics Telecommunication Engineering; developed telecommunication infrastructure; waste experience of stakeholders.	Lack of regional policy for RTDI; limited spatial entrepreneurship; low specialization/insufficient connection with educational and research institutions; lack of business networks; low development of ICT applications; business size/absence of business directions; lack of structures for supporting entrepreneurship and ICT; lack of investment; financial deficiency
Malopolska (Poland)	Well-developed mobile broadband infrastructure; a lot of young citizens with good digital and computer skills; highly qualified young employees in ICT sector; high concentration of companies in the ICT industry; good performance in implementing EU funded ICT projects.	Barriers for accessing broadband infrastructure, especially in rural areas; lack of e-skills for older citizens; shortage of funds in SMEs; weak business environment for supporting SMEs; insufficient promotion of ICT in SMEs and among older inhabitants.
Castilla y Leon (Spain)	Good broadband coverage; presence of leading ICT related reference centres and facilities; widespread use of electronic banking by SMEs; digital signature and online processing, especially when dealing with government organizations; availability of qualified professionals trained in ICT participating in the region's university and vocational training systems; specialisation of ICT on the mobility and security; high number of households with computers, other devices and Internet access; high use of e-commerce; high percentage of digital natives; high use of mobile devices; well-developed e-government services and availability of applications and resources that can be shared among public; existence of a regional Open Government Strategy; existence of a region-wide administrative structure (e.g., local and provincial governments) and consolidated initiatives for ICT-related support for small-scale local entities; significant number of qualified ICT professionals in public organizations; highly developed e-medicine system and staff; existence of the ICT implementation model in the area of education.	Complicated geographical situation (large mountainous areas), which makes the ICT infrastructure deployment more difficult; lack of ICT network; excessive disintegration of ICT projects; low ICT adoption levels by SMEs, especially in retail businesses; infrequent use of ICT in SMEs daily work; lack of ongoing ICT training opportunities; low level of ICT sector internationalization; aging population with low level of ICT skills and knowledge; high share of population not using Internet; limited leadership, resistance to change and insufficient internal coordination among public institutions for increased ICT application; unwillingness of simplification of government processes making them available online; lack of research of social and economic return on investment related to ICT usage; hesitation to use ICT in classroom by a certain percentage of teachers; difficulty in extending digital public services in health care due to region-wide dispersion.
Sør Trøndelag (Norway)	Well-developed ICT infrastructure; presence of education and R&D institutions with high technological knowledge; well-educated population with high ICT skills; high-income country with high ability to purchase goods in regional and national markets.	Areas and businesses still without Internet or broadband access; companies lacking competences and knowledge about digital economy opportunities; distance to markets; distance between education and R&D institutions; smaller companies lacking vision/digital strategy, technology savvy (i.e. sufficient digital skills in company management, with little or no cooperation with R&D environment, short-term planning, limited marketing skills, lack of staff recruitment planning for the future development, lack of cooperation with other businesses).
	Opportunities	Threats

Latvia	Use broadband Internet access in most public areas and get access to fast internet connections; exploit good digital skills of Latvian population; create opportunities for digital innovation and application in business; good opportunities for SMEs to increase e-commerce activities in Latvia (two times more online shoppers in Latvia than abroad); raise awareness on the use of ICT tools among general population; produce a Common Action Plan for SMEs, promoting their development and competitiveness in SDM; use EU funds to develop infrastructure, technologies and e-government.	Largest share of investment in ICT sector comes from the EU funds CF (~83%), which could lead to additional unplanned burden on the state budget, when EU funds are no longer available threatening the development of ICT infrastructure; e-commerce development threatened by low number of SMEs selling online; failure to develop e-skills can hinder strategic knowledge and understanding of new use of ICT tools; threats of losing markets if SMEs unable to compete; outflow of ICT specialists (brain-drain).
Sofia (Bulgaria)	Develop new e-government services; use EU funds for fostering innovation; exploit good potential for developing e-government and mainstreaming ICT in enterprises; develop industry in towns outside Sofia.	Threat of a digital "exclusion" of remote, sparsely populated and rural areas and socially disadvantaged people; stagnation of the development of ICT infrastructure and e-government; dysfunctional ecosystem for innovation (science-education-innovation); growth and export potential of the industry, and especially SMEs can be limited without large scale implementation and usage of ICT; inefficient absorption of EU structural and national funds, and other financial instruments.
Zadar (Croatia)	Access to enormous fund of knowledge; opportunities to facilitate business development and make greater profits by using ICT; opportunities for diversification of sales channels and increasing competitive advantages; increase number of customers and lower business costs; opportunities provided by the access to EU funds.	Access to confidential business information and invasion of privacy; exodus from rural areas; cybercrime, brain-drain.
Sachsen-Anhalt (Germany)	Opportunities to develop new innovative digital products; develop innovative ideas; use new technologies as a new chance; establish new organisational models; work more flexibly; develop lively corporate culture and flexible working teams; attract external expertise, get new offers and initiatives for the recruitment of skilled workers; increase customer satisfaction; develop digital communication and interaction with customers; evaluate customer behaviour through digital market and e-shops; increase individual offers; adjust more user friendly way of communication; use change in the market as a chance; consider digitalisation as an important future market; be more efficient applying integrated ICT solutions; get more information about clients/customer through Big Data Analysis.	New market entrants; competitive pressure, new technologies, which can reduce and threaten SME's position in business; losing clients and market to competitors; shift of work areas; threats related to IT security and characteristics of digital economy; threats created by new technologies changing working requirements, rapidly changing situation by fast-paced nature of ICT and raising pressures to change; acceleration of product and technology development; lack of an overview of alternative financial possibilities and eligibility conditions; enterprise related innovation obstacles; demographic change; shortage of skills; upheaval of familiar business models.
Pannon Novum (Hungary)	Opportunities to increase efficiency in work; specialise in the production of a particular high-added value software; increase SMEs e-commerce activities; use results of government IT and e-administration programmes; further accelerate the existing start-up ecosystem.	Low online presence of companies and low extent of IT based operations, which may cause loss of efficiency and competitiveness; exodus from rural areas; incomplete (computer and) internet penetration of micro-enterprises, which weakens their business perspectives; widening ICT divide between large multinational companies and domestic SMEs.

Kainuu (Finland)	Thanks to a good baseline, companies have opportunity to grow by implementing digital tools and exploiting DSM perspectives; prospective emerging ICT sector; improving average education level in the region.	Division of the population between digital users and non-users; negative trend of population growth prevents undertaking of large & costly initiatives; lack of an urban centre hinders/slow down knowledge intensive development.
Ostrava (Czech)	Opportunities to use increasing support for start-ups and application of R&D results in practice providing a good potential for the creation of new businesses; opportunities for increased use of the EU financial instruments promoting the motivation of recipients and development of sustainable support tools; reduction of administrative demands and processes associated with the use of EU funds and putting greater emphasis on tailoring support to local needs for the consequent strengthening of territorial and integrated dimensions; developing technologies and increasing support for "smart cities"; increasing the use of modern IT; producing more ICT experts and skilled workers facilitating foreign investment and development of new ICT related research centres.	Threats that the region will not be able to adjust to global trends in R&D; misdirected financing from EU structural funds and their misuse; failure to use the built R&D infrastructure; failure to provide digital and technological skills for older and less-educated people leading to increased unemployment; increased support for applied research at the expense of basic research.
West Macedonia (Greece)	Europe 2020 - NSRF 2014-2020; Implementation of RIS3 Priority 5: Digital Convergence and Entrepreneurship; Integration in the production of new economic activities; ICT Infrastructure development; Digital Single Market; Interoperability & Standards; Trust & Security; fast and ultra-fast Internet access; research and innovation; enhancing digital literacy, skills and inclusion; ICT-enabled benefits for WM region; cross-border business opportunities	Continuation of generally poor economic conditions; limited response of the stakeholders in RTDI actions; limited application of RTDI and ICT in the production; low competitiveness; high unemployment; decreasing industrial activities
Malopolska (Poland)	Opportunities to use EU funds for innovative projects and activities related to adoption of modern technologies, such as ICT; develop e-government services; improve ICT skills among citizens; invest in tele-care and tele-medicine; invest in smart city technologies.	Threats placed by the lack of public funds for implementation and extension of e-government services; lack of funds for investment in wire (fibre optics) broadband infrastructure; limited interest of main mobile operators for network expansion in rural areas; lack of interest of older people to use computers and ICT in everyday life.

Castilla y Leon (Spain)	<p>Opportunities to use EU funds for implementing objectives and priorities of the ICT sector; use ICT as a cross-cutting technology in the region's specialisation pattern; develop nearshoring: capacity for the region to allow ICT companies to set up operations in the region; use satellite technologies and mobile broadband to make service extension easier; increase in consumer demand for new digital contents; make globalization of companies easier by using ICT; exploit e-commerce and electronic marketplaces act as supplementary sales channels; develop new funding models for innovative companies and support for entrepreneurs; use new technologies and trends: social networks, mobility, and geolocation services; telecommuting; cloud computing, and new pay-per-use models, Open Data; new models for collaboration with other companies; use constantly increasingly usable technologies for private citizens and the opening of new access channels for information and training; use great potential of the Spanish e-ID for providing public and private digital services; increase use of ICT in the public sector and create new public-public and public-private partnership models that permit costs savings and make use of synergies; use ICT to boost energy savings and develop smart cities; develop new educational models via ICT; use ICT as tools for efficient provision of public health services at a distance with the use of e-Health and telecare.</p>	<p>Low profitability of operators for telecommunication infrastructure in the rural areas; difficulty for extending telecommunications infrastructures due to the differentiated application and specificity of particular aspects of environmental and urban planning standards; loss of competitiveness if companies don't manage to adapt to ICT in globalized setting; costs associated with product distribution on e-commerce platforms; complex ICT-related regulatory framework; low confidence level of citizens in the digital setting; threats presented by overly-complicated e-government services with complex digital certification systems; rapid technological change that makes adaptation for the public administrations difficult; ICT related regulatory modifications that can implicitly bring significant changes for existing economic situation and create difficulties for timely implementation; lack of interoperability and standardization of digital contents and services.</p>
Sør Trøndelag (Norway)	<p>Opportunities to get easier and cheaper access to necessary technology; easier access to necessary competences; more cooperation between small companies on digital development.</p>	<p>Lack of incentives to develop broadband access in all areas; difficulties in getting access to relevant competences to develop operational company with the strategic vision.</p>

Appendix 2. List of SKILLS+ stakeholders

District Sofia, Bulgaria

Organization	Address
Ivelina Peneva	Ministry of Economy of Bulgaria 8, Slavyanska Str., Sofia 1052, Bulgaria Tel.: +3592/9329 220 E-mail: i.peneva@mi.government.bg URL: http://www.opcompetitiveness.bg/
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Zadar, Croatia

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Croatian Chamber of Economy – Zadar County Chamber	Ulica Špire Brusine 16, 23 000 Zadar, Croatia Tel.: +385 23 211 747/+385 23 212 930 Fax: +385 23 213 923 e-mail: ppedisic@hgk.hr URL: https://www.hgk.hr/zupanijska-komora-zadar
INOVAcija - The institution for development of competence, innovation and specialisation of Zadar County	Trg tri bunara 5, 23 000 Zadar, Croatia Tel.: +385 23 251 150 Fax: +385 23 340 229 E-mail: martina.vukasina@inovacija-zadar.hr URL: http://www.inovacija-zadar.hr/en/
Zadra Nova - Zadar County Development Agency	Grgura Budislavića 99, 23 000 Zadar, Croatia Tel.: +385 23 492 880 Fax: +385 23 492 881 E-mail: renata.marusic@zadra.hr URL: http://www.zadra.hr/en/
Zadar County - Department for Economy	Liburnska obala 6, 23 000 Zadar, Croatia Tel.: +385 23 350 360 Fax: +385 23 350 333 E-mail: gospodarstvo-nekic@zadarska-zupanija.hr URL: https://www.zadarska-zupanija.hr/
Bruncin Ltd.	Lastovska 4, 10 000 Zagreb, Croatia Tel.: +385 99 6806 990 E-mail: lovro@bruncin.com URL: http://www.bruncin.com/contact/

Ostrava, the Czech Republic

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Ministry of Industry and Trade Ministerstvo průmyslu a obchodu	Na Františku 32, 110 15 Praha 1 Tel.: +420 224 851 111 Fax: +420 224 811 089 JUDr. Ing. Břetislav Grégr, MBA Director of EU section E-mail: gregr@mpo.cz URL: http://www.mpo.cz/

Moravian Silesian Region	Krajský úřad - Moravskoslezský kraj 28. října 117 702 18 Ostrava Tel.: +420 595 622 222 Fax: +420 595 622 126 Ing. Tomáš Kotyza Director of the Environmental Section E-mail: tomas.kotyza@msk.cz URL: www.msk.cz
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Sdružení pro rozvoj Moravy a Slezska	Výstavní 2224/8 709 00 Ostrava - Mariánské Hory Ing. Pavel Bartoš President of the Counsel Association URL: www.msunion.cz
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Technologická agentura České republiky	Evropská 1692/37 160 00 Praha 6 Ing. Miroslav Janeček, CSc. Board Member E-mail: janecek@tacr.cz URL: http://www.tacr.cz/
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Castilla y Leon, Spain

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AEPC Association of institutions and SMEs of cultural heritage	Campus Francisco de Praves Calle Valle de Arán, s/n, 47010 - Valladolid
Cluster AEICE Innovative Business Group Efficient Construction	Campus Francisco de Praves Calle Valle de Arán, s/n 47010 – Valladolid Tel.: +34 983 25 22 10 E-mail: beatriz.alonso@proacttia.com URL: http://www.aeice.org/
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Regional Ministry of Economy and Treasure	C/ José Cantalapiedra, 2 47014 – Valladolid Tel.: +34 983 41 40 00 E-mail: pricasja@jcyl.es / GarRuig@jcyl.es URL: http://www.gobierno.jcyl.es/web/jcyl/Gobierno/es/Plantilla66y33/1284433942833/_/_/_

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Chamber of Industry and Commerce of Halle/Saale	Industrie- und Handelskammer Halle-Dessau Franckestraße 5 06110 Halle Tel.: +49 345 212 6265 E-mail: skuehling@halle.ihk.de URL: https://www.halle.ihk.de/
Chambers of Crafts Magdeburg	Handwerkskammer Magdeburg Gareisstraße 10 39106 Magdeburg E-mail: RMeseberg@hwk-magdeburg.de URL: http://www.hwk-magdeburg.de/
Chambers of Crafts Halle/Saale	Handwerkskammer Halle (Saale) Graefestraße 24 06110 Halle Tel.: +49 345 299 9228 E-mail: ssommer@hwkhalle.de URL: https://www.hwkhalle.de/
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Investment and Marketing Corporation Saxony-Anhalt	<p>IMG Investitions- und Marketinggesellschaft Sachsen-Anhalt mbH Am Alten Theater 6 39104 Magdeburg Tel.: +49 391 568 9941 E-mail: julia.buetow@img-sachsen-anhalt.de URL: http://www.investieren-in-sachsen-anhalt.de/</p>
IT Cluster Central Germany	<p>Cluster Informationstechnologie Mitteldeutschland e. V. Geschäftsstelle Leipziger Straße 110 04425 Taucha (b. Leipzig) Tel.: +49 342 984 878 20 E-mail: andreas.vierling@it-mitteldeutschland.de URL: http://www.it-mitteldeutschland.de/homepage/</p>
IT and multimedia industry organisation Saxony-Anhalt	<p>Verband der IT- und Multimediaindustrie Sachsen-Anhalt e. V. HAUS DER WIRTSCHAFT Humboldtstraße 14 39112 Magdeburg Tel.: +49 391 6 28 88 51 E-mail: pasemann@vme.org URL: http://www.vitm.org/index.php?id=11</p>
Regional Planning Authority Altmark	<p>Regionale Planungsgemeinschaft Altmark Ackerstraße 13 29410 Hansestadt Salzwedel Tel.: +49 03901/30 17 20 E-mail: stefanie.patz@rpg-altmark.de URL: http://www.altmark.eu/</p>

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Municipality of Grevena	<p>Municipality of Grevena 51100 Pl. Eleutherias 1, Grevena - Greece Tel.: +30 24623 50830 E-mail: dimarxos@dimosgrevenon.gr</p>

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West Macedonia Technological Educational Institute	West Macedonia Technological Educational Institute 50100 Koila Kozani - Greece Tel.: +30 24610 40161-4 URL: http://www.teiwm.gr/
Chamber of Commerce of Kastoria	Chamber of Commerce of Kastoria 52100 Mitropoleos Str. 60, Kastoria – Greece Tel.: +30 24670 26926, 24670 28537 URL: http://www.kastoriachamber.gr/
Business Experts	Pantopolio “to kentriko” (Ioannou Georgia) 52051 Nestorio Kastoria - Greece Tel.: +30 24670 31074 E-mail : gogoioannou@hotmail.com HOTEL 1450 (Evangelou Ioannis) 52051 Kotili Nestorio Kastoria – Greece Tel.: +30 24670 82400 E-mail: info@hotel1450.com URL: www.hotel1450.com Dimitriadis Pantelis 52051 Nestorio Kastoria – Greece Tel.: +30 24670 31118 E-mail: grammostransfer@gmail.com URL: www.vatina.gr Manitarofiloi (Klisiari Despina) Association of Mushrooms of Western Macedonia Tel.: +30 6976770312 URL: http://www.mycohellas.gr/mc/
OTE Group of Companies	Fixed, Mobile & OTE TV Customer Service OTE Group Tel.: +30 13 888 Fixed, Mobile Corporate Customers Service OTE Group Tel.: +30 13 818 Fax: +30 210 3405129 URL: https://www.cosmote.gr/hub/
Forthnet SA	FORTHNET SHOP KOZANI NIKOLAOU BROS INFORMATION SYSTEMS 50100 Tsontza Str. 5, Kozani – Greece Tel.: +30 24610 26440 URL: http://www.forthnet.gr/Home.aspx?a_id=1218#sthash.U9tYLVCO.dpbs

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Chamber of Commerce and Industry for Győr-Moson-Sopron County	Judit Zubonyai, Félhelyesné H-9021 Győr Szent István str. 10/a E-mail: fehelyesnejudit@gymkik.hu URL: http://www.gymkik.hu
Pennon Wood and Furniture Cluster (Accredited Innovation Cluster)	Boglárka Ágfalvi H-89400 Sopron, Malompatak str. 13. E-mail: boglarka.agfalvi@effixmarketing.eu URL: http://panfa.hu/
Zala County Foundation for Enterprise Promotion	András Nagy H-8900 Zalaegerszeg Köztársaság str 17. E-mail: nagyandras@zmva.hu URL: http://www.zmva.hu
Zalaegerszeg Technology Centre	Dr. András Hány H-8900 Zalaegerszeg, Fészek u. 4. E-mail: andras.hany@apnb.hu URL: http://www.tc.org.hu/
Local Government of County Vas	Szabina Nemeth H-9700 Szombathely Berzsenyi D. tér 1. E-mail: nemeth.szabina@vasmegye.hu URL: http://www.vasmegye.hu
Neumann Computer Science Association	József Nemes H-9700 Szombathely, Karolyi Gaspar sqr. 4. E-mail: njozsef@ttk.nyme.hu URL: http://njszt.hu/

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Kurzeme Planning Region	Elizabetes iela 4-1, Riga, LV-1010, Latvia Tel.: +371 67331492, +371 67331634, Fax: +371 67331285 E-mail: pasts@kurzemesregions.lv
Zemgale Planning Region	Jelgava, Katolu iela 2b, LV-3001, Latvia Tel.: +37163027549 Fax: +37163084949 E-mail: zpr@zpr.gov.lv
Vidzeme Planning Region	Jāņa Poruka iela 8, 108 kabinets LV-4101, Cēsis, Cēsu novads Tel.: +371 64116006 Fax: +371 64116012 E-mail: vidzeme@vidzeme.lv
Latgale Planning Region	Latgale Business Center Saules iela 15, Daugavpils LV-5401, Latvia Tel./Fax.: +371 654 28111 E-mail: info@latgale.lv
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	Fax: +48 12 42 29 785 E-mail: sekretariat@wup-krakow.pl URL: http://wupkrakow.praca.gov.pl
Board of Malopolska Voivodship, Malopolska Council for Information Society	Urząd Marszałkowski Województwa Małopolskiego Małopolska Rada ds. Społeczeństwa Informacyjnego Racławicka 56, 30-017 Kraków, Poland Tel.: +48 12 630 35 90 E-mail: cf.sekretariat@umwm.pl URL: https://www.malopolska.pl/
Marshal Office of the Malopolska Region, Management of the Operational Programmes Department, Digitization Office	Urząd Marszałkowski Województwa Małopolskiego Departament Zarządzania Programami Operacyjnymi Wielicka 72, 30-552 Kraków, Poland Tel.: +48 12 29 90 940 Fax: +48 12 29 90 941 E-mail: zpo.sekretariat@umwm.pl Biuro Cyfryzacji Racławicka 56, 30-017 Kraków, Poland Tel.: +48 12 630 35 90 E-mail: cf.sekretariat@umwm.pl URL: https://www.malopolska.pl/
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Business & Progress Foundation	Fundacja "Progress and Business" Juliusza Lea 12B, 30-048 Kraków, Poland Tel.: +48 12 6360100 Fax : +48 12 6368787 E-mail : office@pbf.pl URL: http://www.pbf.pl/

Sør Trøndelag, Norway

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Nord-Trøndelag County Authority	Nord-Trøndelag fylkeskommune Fylkets hus Pb 2560 7735 Steinkjer Tel.: +47 74 113600 E-mail: postmottak@ntfk.no URL: http://www.ntfk.no/
Norwegian University of Science and Technology; NTNU	Norges teknisk-naturvitenskapelige universitet; NTNU 7491 Trondheim Tel.: 73 59 50 00 E-mail: postmottak@ntnu.no URL: http://www.ntnu.no/
SINTEF; Research Institute	Stiftelsen SINTEF Postboks 4760 Sluppen

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North-Trøndelag Electricity Company (NTE)	Nord-Trøndelag Elektrisitetsverk as (NTE) Sjøfartsgt. 3 7736 Steinkjer Tel.: +47 07400 URL: http://www.nte.no/index.php/no/kundesenter/kontakt URL: https://www.nte.no/index.php/no/
Nasjonalparken Business Garden	Nasjonalparken Næringshage Oppdal Næringshus Inge Krokanns veg 9 7340 Oppdal Tel.: +47 92 87 88 45 E-mail: post@nasjonalparkhagen.no URL: http://nasjonalparkhagen.no/
Rørosregionen Business Garden	Rørosregionen Næringshage Ol-Kanelesaveien 2 7374 Røros Tel.: + 47 936 67 540 E-mail: post@roroshagen.no URL: http://roroshagen.no/

Appendix 3. SKILLS+ GOOD PRACTICES

District Sofia, Bulgaria

Sofia Tech Park

<http://sofiatech.bg/en/>

Sofia Tech Park is the first Science and Technology Park in Bulgaria. First phase started in 2012 and was financed by OP Development of the Competitiveness of Bulgarian Economy; Second phase started in 2016 and was financed by OP Innovation and Competitiveness. It is situated on 5700 sq. m. and it has 17 000 sq. m. of buildings.

Laboratory complex: The laboratory complex has 11 high-tech laboratories specializing in different areas of science such as high performance computing, virtual reality, rapid prototyping, cyber security, bioinformatics, etc.

The laboratories are:

- ❖ Bioinformatics Laboratory BioInfoTech;
- ❖ BioPharm Laboratory Complex with 3 labs;
- ❖ "Artificial Intelligence and CAD systems" Laboratory;
- ❖ "Intelligent communication infrastructures" Laboratory;
- ❖ Mikronanotehnologies (MINOLab);
- ❖ Virtual and Augmented Reality Laboratory;
- ❖ Cybersecurity Laboratory;
- ❖ 3D creativity and new products rapid prototyping (use of innovative 3D printers, only 2 exist in Europe);
- ❖ High performance computing laboratory;

Incubator: The incubator supports the development of innovative startup and spin-off companies whose main activities fall within the focus areas of the park: ICT, life sciences, biotechnology, green energy and clean technologies. The companies have access to office space, mentoring and a range of services.

Currently, 78% of the office space located in the incubator is occupied by 22 companies. For 15% of the offices, negotiations are underway and expected to sign contracts.

Innovation forum: The innovation forum is a modern and multifunctional building with 1,000 seats which can be divided into three smaller halls. The forum offers space for meetings and events on topics related to technology, innovation, entrepreneurship, science and education.

Experimentarium and visitor center: This interactive innovation center is for the general public and in particular for children and students with interest in science and technology.

Support for commercialization of innovative products, processes and providing innovative services

The procedure was implemented within OP Development of the Competitiveness of the Bulgarian Economy 2007-2013.

- ❖ 66.3% of the projects contracted within Priority Axis 1 are related to this procedure;
- ❖ Projects approved and implemented: 60.

Impact data assessment:

Indicator 1 - Number of innovations introduced on the market

- ❖ 26 innovations introduced or ready to be introduced

Indicator 2 - Number of R&D projects supported in the pre-market phase

- ❖ 11 R&D projects supported

Indicator 3 - Number of R&D projects supported for introduction into the market

- ❖ 29 R&D projects supported

Indicator 4 - Number of researchers employed in enterprises

- ❖ 105 researchers (56 men and 49 women) were employed

Technological modernization of SMEs

The procedure was implemented within OP Development of the Competitiveness of the Bulgarian Economy 2007-2013. Priority was given to companies situated outside the West Planning regions (Sofia) in predominantly rural districts.

A total of 194 projects have been contracted.

Impact data assessment:

Indicator 1- Increasing the production capacity at SMEs

- ❖ Micro enterprises: 49% increased capacity
- ❖ Small enterprises: 45% increased capacity
- ❖ Medium enterprises: 54% increased capacity

❖ Indicator 2 - Reducing the average age of technical equipment

- ❖ Micro enterprises: 24% reduction of the age
- ❖ Small enterprises: 18% reduction of the age
- ❖ Medium enterprises: 37% reduction of the age

❖ Indicator 3 - Number of supported SME introducing the use of new technologies/products

- ❖ Micro enterprises: 11
- ❖ Small enterprises: 40
- ❖ Medium enterprises: 34

Development of managerial capacity and growth of SMEs

The procedure was implemented within OP Innovation and Competitiveness 2014-2020 in order to contribute to the achievement of objectives laid down in the National Strategy for Promotion of Small and Medium-size Enterprises 2014-2020.

Impact data:

- Strengthen the export potential of Bulgarian SMEs by at least 10% by 2023
- Encourage entrepreneurial activity by at least 2% till 2023 through improvement of access to finance by at least 2%
- Reduce energy intensity by at least 5% by 2023
- Increase the resource efficiency of SMEs by at least 0.4% by 2023

Zadar, Croatia

Innovative Zadar Ltd

Company (incubator) was founded in 2003 by the City of Zadar. Initially called 'Business incubator', with the main aim to encourage the development of SMEs in the Zadar area. The initial idea was to provide businesses and technical services, as well as favourable office leases, to facilitate the launch of new entrepreneurs. Towards the end of 2014, the company began the process of business transformation. It changed its name to "Innovative Zadar Ltd" and started with an additional range of activities mainly related to ICT technologies. The main idea was to become, in addition to supporting small and medium enterprises, a carrier of a coordinated and integrated development of ICT services and infrastructure for the local government. The positive effects of this approach is to be a more

efficient and transparent local government with the main aim in developing a large number of online services and local government services intended to be used by citizens, entrepreneurs and tourists.

E-business Competitiveness Improvement Project

The main objective of the E-business Competitiveness Improvement Project was to enhance the competitiveness of Croatian enterprises by increasing their e-business and e-commerce awareness and activities. The project's activities were divided into two components and targeted both Business Support Centres and Small and Medium-sized Enterprises (SMEs). Component 1 focused on increasing the capacity of the 10 Business Support Centres (BSCs) located throughout Croatia, which have been selected to take part in the Project; Component 2, the Business Support Centres, with the support of the Project consultants, raised SME awareness in their regions about e-business and delivered direct assistance on ICT and e-business to targeted SMEs.

FINA E-business

E-BUSINESS-Fina enables easy electronic communication between business partners through the submission of forms, access to information services, payment, and exchange of electronic invoices and electronically signed documents. Special attention is paid to the ongoing development of web services and the advancement of e-business in the Republic of Croatia.

Fina E-Business enables the use of various services:

- (1) E-Invoice;
- (2) E-payment;
- (3) Web Annual Financial Statements Registry (RGFI);
- (4) Concessions Registry;
- (5) E-REGOS;
- (6) WEB-BON.

Ostrava, the Czech Republic

Support of cooperation between SMEs and Universities (or other type of research organisations) in ERDF programme to enhance innovation – 1

OP Operational Programme Enterprise and Innovations for Competitiveness 1st Priority Axes supports cooperation between SMEs and Research organisations (Universities, Czech Academy of Sciences, and other research organisations).

Policy Instrument Operational Programme Enterprise and Innovations for Competitiveness, Priority Axes 1, supports cooperation between SMEs and research organisations (Universities, Czech Academy of Sciences, and other research organisations). The key target is to support transfer of technologies from research organizations to SMEs, enhancement of innovation performance and also overall competitiveness and closer cooperation between SME and research organisation. The issue is that if the SME submits the project application in a partnership with a research organization, the overall percentage of the EU contribution is 15% to 20% higher than when the SME submits the project by itself. The higher EU contribution can facilitate more cooperation. There are two requirements to receive a higher percentage of EU contributions: research organizations must share the project budget minimum of 10% and publish the project results.

Support of cooperation between SMEs and Universities (or other type of research organisations) in ERDF programme to enhance innovation - 2

OP Enterprise and Innovations for Competitiveness, Sub-programme Knowledge Transfer.

The technological transfer from research organisations to SME's is rather problematic and SME's suffer from the lack of capacities and well-trained staff. The OP Enterprise and Innovations for Competitiveness prepared the sub-programme aimed on funding Knowledge Transfers in which the university or research organisation member cooperates directly with the SME. The respective OP provides the possibility for the SME to apply for financial support for the Assistant of Knowledge Transfer employment, infrastructure provision (IT, technical equipment), and cost of training period. The contribution of EU funds is 70% of eligible costs, with the maximum project length up to 36 months.

There are quality criteria, primarily the clarification of expected output, detailed business plan and identification of knowledge that are of a key importance and that will be transferred by the Assistant of Knowledge Transfer. SME's have lower resources for investment in research and development. Despite SME's capacity and financial constraints, they are more effective in using their given capacity and resources in general. Public support directed on SME's can increase their capacities and can contribute to the efficiency of SME's performance improvement. Therefore, the Managing Authority wants to fully utilise the possibility of EU funds and support technological transfer in defined projects realised within a partnership between SME's and research organizations. The sub-programme Technological transfer offers tailored support in the specific areas identified by the project applicant (SME) – including research and development of a new technologies, technological equipment or creation of a new know-how that can represent the added value of the final product or service.

Flexibility of ERDF programme and simplification of system administration

Policy Instrument OP Operational Programme Enterprise and Innovations for Competitiveness 1st Priority Axes:

Policy Instrument Operational Programme Enterprise and Innovations for Competitiveness, Priority Axes 1 is divided into several sub-programmes with specific objectives and indicators. The Managing Authority plans sub-programmes that specifies supported activities, quality criteria, level of support, eligible cost, required documents and time frames (e.g. period of time when the projects can be submitted).

Initially, the Managing Authority set a two-step evaluation. The first step represents the eligibility check of the online application in the form of a brief project description. If the proposal is approved, applicants develop the feasibility study or business plan, CBA analysis and submits the detailed budget. The Managing Authority commissioned the CzechInvest Agency to manage the project administration and to support applicants based on deep experience, knowledge of the situation and its flexibility. The applicants are allowed to amend and complete the missing data and information or slight corrections of the application after communication with CzechInvest experts before the quality control. However, this procedure has a negative impact on the duration of the evaluation process. This is the reason that the Managing Authority is preparing for the simplification of the programme and a one-step evaluation instead.

Kainuun Etu, Finland

RuralDigiServ

Project aims to improve the digital skills and use of IT among farmers and rural entrepreneurs. It is managed by Proagria which provides advisory services for farmers in Finland. Key elements of the project include: delivering the advisory services through online channels, encouraging the use of

digital production management tools and sensor technologies and improving the skills of the target group in terms of digitalisation.

GOLLI

GOLLI/GS1 is a global non-profit organisation that has developed standards for supply chain management. Over 1.4 million companies use the solutions and every day over 6 billion transactions happen where GS1 standards are used. The GOLLI project is solving problems related to the flow of information in commerce. GOLLI (Global Orders, Logistics Labels & Information) is a cloud service especially for SMEs to receive orders, gather the goods to be delivered, order the delivery, print out the pallet identifiers and consignment notes, and send the delivery information to the customer. Developed together with large Finnish supermarket chains, it allows small producers access to a supply chain management system that complies with the requirements of large chains without a large investment and monthly costs.

GOLLI is the direct implementation of the national policy of industry-expert digital services. This policy has resulted from many years of evaluations addressing 1) that Finnish SMEs are small, slow to grow and the distances are such that discourage commercial initiatives, and 2) that while Finland is high on ICT production, it is low on ICT applications. GOLLI is in the centre of addressing both issues.

DIGIBoosti

DIGIBOOST is a policy tool promoting digitalisation of SMEs and midcaps (less than 300 000 000€/annual turnover). It is a TEKES programme which was introduced in 2013. DIGIBOOST is co-funded by 50% of ICT experts (identified by TEKES) to work within businesses in order to: a) improve internationalisation and networking; b) increase development and innovation; c) raise investments and working capital; d) access financing solutions and/or securing the export receivables; e) "other", i.e. open option, for suggestions. It is continuously open for businesses to apply online (<https://www.tekes.fi/en/test-your-idea/#/>). The key criterion is that the effort must include internationalisation and that there has to be a new element in the company (to make the 'digital leap'). The person hired must be a new person with exact skills not already existing in the company.

Digital Service Tray

DST is part of the public sector digitalisation, in Finland and the (EC 2013). According to the OECD (OECD 2016, page 18), the digitalisation of the public sector services is built around three complementary themes: efficiency, effectiveness and good governance (illustrated in the Figure on the left). The DST solution is positioned in the shared areas between i) Efficiency and Effectiveness (empowerment, evidence, demand management, and personalisation) and ii) Efficiency and Good Governance (reliability, participation, citizens' drive, and public value).

Kainuu Social and Health Care Joint Authority (Kainuun sote) administrates the platform and 187 service providers are offering services in Kainuu region (same size as Belgium but still with just 75 000 inhabitants). Kainuun SOTE won the first prize in the National Local Service Competition 2015 with DST. The competition was arranged by the the Association of Finnish Local and Regional Authorities. Service providers praised DST for its free digital market place. Customers have stated that with DST, they have discovered services that they had not found earlier since they had not known of organisations that provide services, but with DST you look for services and not organisations (the customer-friendly logic of service provision). Digital Service Tray (DST) preparatory project is on-going to further develop DST in a transnational cooperation in Northern Periphery and Arctic Programme (NPA).

Saxony-Anhalt, Germany

Strategic Facilitation of SMEs Businesses of Saxony-Anhalt

- ❖ Strengthen SMEs and their innovation potential to handle the challenges of productivity, innovation and export focus
- ❖ Emphasize the importance of integration and use of ICT applications for innovation and growth
- ❖ Identify IT security, e-health, e-Commerce as important business sectors
- ❖ Strengthen ICT as a knowledge-intensive field and connect with classic production areas such as engineering, automotive engineering and chemistry

ICT-Strategy "Digital Saxony-Anhalt 2020"

- ❖ Joint guiding principle and a basic agenda action for implementation of political objectives and targeted use of ICT in Sachsen-Anhalt
- ❖ Aims development and establishment of new working and organizational structure based on new electronic and digital opportunities in relation to collaboration of politics and administration, optimization of processes at interfaces to the economy as well as involvement and participation of citizens
- ❖ Digital Agenda of Sachsen-Anhalt elaborated by the Ministry of Economy, Science and Digitalisation until Autumn 2017; launch conference of the Digital Agenda took place in February 2017 in Magdeburg, Sachsen-Anhalt

Smart Specialization Strategy Sachsen-Anhalt 2014-2020

- ❖ ICT was defined as a cross-sectional field for Sachsen-Anhalt
- ❖ Development of ICT as an innovation-relevant cross sectional field for the intensive cross-industry networking of lead markets (machine and plant construction, health and medicine, mobility and logistics, chemistry and bio economy, food and agriculture) and economy
- ❖ Supplying of ICT for the development of innovation potentials
- ❖ Build-up of the "Cooperation Network Digital Economy and Science of Sachsen-Anhalt" emerged from the Smart Specialisation Strategy Sachsen-Anhalt and started in January 2017

IT Cluster of Central Germany

- ❖ IT Cluster offers different opportunities for knowledge sharing such as working classes, workshops, and sector and general meetings
- ❖ Cluster-members cooperate intensively with universities from Central Germany to cultivate and protect potential employees
- ❖ Serves as an industry network of the IT Sector in Sachsen, Sachsen-Anhalt and Thuringia
- ❖ Strengthens the regional IT landscape

E-Business Pilot Magdeburg

- ❖ Advising and supporting approx. 70,000 companies in the jurisdiction of the Chamber of Industry and Commerce Magdeburg in the North of Saxony-Anhalt; Assisting in using ICT and fields like IT security, data security, online marketing, optimization of business processes, knowledge management
- ❖ About 80% of companies have less than 50 employees; More than 40% have less than 20 employees
- ❖ No internal IT department in many SMEs
- ❖ Initiative ended after three successful years in September 2015
- ❖ Pilot is still available to the resolution of SMEs questions
- ❖ Carrier of the e-Business pilot maintains the project medium sized sectors 4.0 agency

HalberStadt-App

- ❖ HalberStadt App was the first city application in Saxony-Anhalt and released in 2011.
- ❖ It is an important communication tool for the city and its online marketing, its citizens, its tourists and prospective enterprises and investors.
- ❖ There are different information available (e.g. about citizen services, activities as well as business locations and commercial properties).
- ❖ HalberStadt App won the special award "Pioneer Saxony-Anhalt 2014"
- ❖ Since 2014, information about accessibility of sights and restaurants and utilisation by people with handicaps were included in the application.
- ❖ The function "Citizen Report" has been improved to allow a faster transmission of instructions to the city by citizens.
- ❖ An English version of the app is to be developed. A push button will be also developed to spread news more effectively as well as expand and improve the companies' database.

Western Macedonia, Greece

DIGI-LODGE

Funding actions through DIGI-LODGE led to the achievement of the following specific objectives:

- ❖ Possibility of online booking for all the services and products of tourist facilities (mandatory for accommodation services, ideally for other services since they exist)
- ❖ Quality and complete web presentation of tourist facilities and of local areas they are established in
- ❖ Attracting new visitors and maintaining customers by providing integrated electronic services before and/or during the stay
- ❖ Tourist related SMEs that were supported in RWM were 49 and total amount of funding was about 730,000 euros (ESRF)
- ❖ Estimated increase of the number of tourists in targeted accommodations that used the new ICT technologies in direct booking is more than 100%
- ❖ Estimated increase of SMEs working in tourism sector using provided services through a new website 15%
- ❖ Estimated increase of SMEs working in tourism sector using ICT after the end of the project 30%

WINES OF CRETE

Wines of Crete is a joint venture of the Heraklion Winemakers' Network, the creation of the Chania - Rethymnon Winemakers' Network and the Prefecture of Lasithi which later joined Heraklion's Network. The two networks proceed in operating independently, but cooperate at all levels under the umbrella of Wines of Crete and a collective scheduling of activities. The joint brochure, the map of the Wineries of Crete, the 20' informative film, the portal (www.winesofcrete.gr), the application for smart phones, the use of social networks as well as the organization and participation in exhibitions are promotional tools that help to achieve its goals. The Wineries' signs, quality map of visited wineries, and participation in tourism fairs operate for the consolidation of the wine-touristic power. Today, 31 wineries are promoted through the portal which started in 2011 (also in Facebook, Twitter, Flickr and YouTube social networks and channels). More than 2,000 different people visited the portal in the first year and reordered an increase of the number of visitors around 10% per year. It is estimated by the Wines of Crete administrators, that the portal added value in sales of Crete's wine after the operation of the new portal by an increase of about 5%. Exports of Crete wine increased from 2011 to 2015 to around 10%.

Digital Coverage S.A.

“Digital Coverage S.A.” in its latest announcement declared that 1.683 investment plans were approved under the action “Providing financial aid to retail companies with a view to making digital investments” (Digi-Retail). The number of business plans that successfully passed the evaluation stage until November 23, 2011, reached the total budget of € 76, 73 mil. The approved investment plans reached 549 approvals for all regions under the OP "Digital Coverage". Available Public Aid for Western Macedonia was 3 million euros.

The wide participation in the action shows the needs of the retail industry for technological development in order to cope with increasing competition. Greek retail enterprises exploit the chance for modernization under the action Digi-Retail, aiming to provide direct, reliable information, and quality services for their customers. This can be achieved by simplifying and improving internal processes, and by improving extraversion and their overall technological infrastructure.

The development of retail sector e-business promotes enterprises efficiency and productivity, cost reduction and the creation of competitive advantages for enterprises that make use of it. The use of ICT in the supply chain contributes to cost reduction; it leads to more effective inventory management and to more reliable customer services. The use of ICT in sales and marketing can contribute to new markets generation, expand the customer's base and increase the business' income.

Pannon Novum West-Transdanubia, Hungary

Modern Business Program

The NATIONAL INFO COMMUNICATION STRATEGY of Hungary 2014-2020 will support the development of ICT Skills of the SME sector, and the Modern Businesses Program is a seeded project within this 2014-2020 programming period. The Modern Business Program focuses on the development of digital competences of micro, small and medium-sized enterprises through the reduction of primary (digital illiteracy) and secondary (low degree of utilisation) digital divide, enabling micro and small enterprises to recognise and utilise business opportunities from the introduction of ICT systems, as well as make available the benefits of the digital ecosystem to those lagging behind (e-inclusion).

Through connecting to the digital economy, the programme will develop external and internal information systems of the ICT sector with enterprises using electronic (commercial, banking, etc.) services of the sector, utilising incentives towards ICT development, R&D and innovation activities. The near 2-year long programme particularly helps rural enterprises and strives to leverage physical assets, softwares and methodologies during the SMEs' lifecycle, which replaces the original paper-based work by changing the existing, basic information solutions.

As more than 1400 SMEs joined the MUP program, it has been a true success story for the Hungarian Chamber of Commerce and Industry, considering the project will run at least until 2017. Research results justify that the digital literacy of Hungarian SMEs is very low compared to the European average. Hungarian SME's use of the advanced IT solutions is limited, whereas leaders and decision makers of SMEs lack the knowledge of opportunities to use ICT technologies. The Chamber has established a nationwide consultancy network including ca. 30 professionals to help enterprises with implementing digital solutions and their application to achieve more efficient results. The Chamber also organized a business tour visiting about 127 locations and organized workshops on ICT applications in business. Additionally, a supply network was established which could also be joined by SMEs from rural areas.

Improvement of Modern Business Environment

The Economic Development Operational Programme (EDOP) is aiming to encourage a sustainable growth in the Hungarian economy in accordance with the Competitiveness Concept of the Ministry of Economy and Transport to implement the first priority of the New Hungary's National Development

Plan. The priority level 3 of EDOP is called "IMPROVEMENT OF MODERN BUSINESS ENVIRONMENT". In a developed business environment, widely used business and ICT services can contribute to the effective operation of competitive markets. Furthermore, through the development of entrepreneurial and ICT skills, they can also contribute to the improvement of the quality of human resources in an indirect way. The development of the infrastructure and usage of ICT are key areas of the business environment, that are – together with appropriate investments to human capital – indispensable to establish an information society, can directly support the development of the IT sector, as well as improve the quality of general physical capital contributing to permanent economic growth. Domestic SME and multinationals' sectors substantially differ in terms of the revenue and gross-added value. The main reason for the diverse performance can originate from the following: problems with economies of scale in certain industries, obsolete technological and information communication systems, limited access to funds, low level innovation capacity, and improper conflict of market access and considerations. Apart from these, mentionables are: marketing, HR, financial and IT skills, lower level capabilities, as well as low attitude of co-operation. With this measure, the operative program helped to improve these competencies.

I3CT Cross-border Clustering Project Pannon University/Regional Innovation Agency/REDEA (HR)/MEV (HR)

Fostering the development of a knowledge-based economy is a crucial yet very complex process. It involves stakeholders from different sectors, the most important of which are: academia (higher education and research institutions), entrepreneurship support institutions (development agencies and innovation support institutions) and innovative SMEs. For their operations, all of these stakeholders need a strong information base and excellent human and organisational capacities. Nevertheless, these stakeholders can't be as effective acting on their own. The most important part in a knowledge-based economy is close cooperation and networking of all these stakeholders which is the focal point of the I3CT Project. For the scope of the I3CT Project, the PE University will lead the research on the innovation potential of the region, development of a trilingual ICT e-learning course and organization of a study tour.

The B2B events will foster the cooperation of innovative SMEs with the aim of initiating new clustering initiatives. Experience of MIT CLUSTER was a good basis for the new initiatives. The database of experts and technologies, as well as a web-based networking platform will be developed by MIT and its experts. This will improve the cooperation and decision-making process. PORA (Development Agency of Podravina and Prigorje) will organise the project activities in Koprivnica-Križevci county. MEV supported the research, equipped the ICT lab for trainings and organised study tour for PE in Čakovec.

The Direct target groups are employees and the management of entrepreneurship support institutions, innovative ICT sector SMEs, and students and professors at IT universities. Others benefiting from the project are decision-makers, ICT and other experts and the general public. The research will be conducted on the Croatian side also by experts sub-contracted by REDEA using the common methodology.

The technology screenings of innovative SMEs will also be done using the common methodology. The associated partner of the project the DDRIŮ used its network to support the project activities and disseminate the results.

Number of newly created/developed joint databases: 2;
Number of newly elaborated/harmonised documents (development plans, studies, researches, surveys, technical and training materials): 2;
Number of newly established/developed partnerships/joint networks/structures: 2;
Number of organisations/institutions/authorities taking part in cross-border projects 7; and
Number of people indirectly benefiting from the project: 600.

The Republic of Latvia

E-Leadership skills for SMEs

<https://www.likta.lv/LV/Aktivitates/Lapas/MMU-projekts.aspx>

Project “ICT training for small and micro businesses to promote competitiveness and productivity” was aimed at raising productivity, innovation and increase in the long-term competitiveness of small and micro-enterprises by teaching how to effectively apply ICT technologies and e-skills. Trainings were delivered by 16 modular programs in three training areas: 1. Strategy (ICT for innovations; Market analysis; Management of changes; Management of processes and products). 2. Technologies (Infrastructure; Security; Multimedia and graphical design; Office software), and 3. Business processes (Client and partner management; Finance management, accounting; E-commerce). The project was co-financed by the EU Social Fund (80 %). In total, 6784 training courses were held for 1446 SMEs and 3249 employees of enterprises were trained. Trainings were held in 20 municipalities across Latvia. The project was nominated by Latvian Investment and Development Agency and submitted to the EU's competition “Regio Stars 2015 - The Awards for Innovative Projects”. Also, the project was presented to the EU high-level e-skills conference and Digital Assembly. Project experience was presented to e-leadership conference “Future e-Leadership Education and Training for SMEs and Start-up” in Brussels which was organized by the European Commission's DG GROWTH.

Project “Support for small and micro ICT skills development and implementation” is a continuation of the previous EU funds period project for SMEs. The project is co-financed by the EU European Regional Development Fund (70%). It is estimated that within the project 6500 entrepreneurs and self-employed persons will be trained. Trainings will be delivered in 3 thematic blocks: 1. Digital technology (new tendency – cloud computing, online collaboration, infrastructure and safety). 2. Digitalization of company internal processes (business and financial management tools, marketing and document management tools), and 3. Digital tools for manufacturing and development of services (digital design tools, customer relationship management and communication tools, manufacturing and process control digital tools and programs).

Information Campaign “e-Skills Week”

<http://eprasmes.lv/>

The aim of this initiative is to raise awareness of the need for citizens to improve their command of ICT skills for work. In result of cooperation between industries, educational bodies and public authorities deliver a large and diverse program of events and activities throughout the year for people at all levels of education and skills. The campaign targets different groups, including SMEs, informing them about the vast range of opportunities that ICT-related jobs present.

Once a week, the campaign informs entrepreneurs about opportunities to raise their level of knowledge and competitiveness on the ICT issues and all opportunities offered by the governmental institutions (*e-services, use of e-signature etc.*), NGOs (*new ICT solutions in e-commerce, cloud computing business opportunities, social networking etc.*) and IT associations (*training's, practical use of ICT, integrating new programs etc.*). It is essential that this measure reaches all Latvian regions and operators concerned. This campaign in Latvia includes communication activities combined with awareness raising events and trainings. There are also possibilities to see live broadcasts of seminars that facilitate access of people interested in the event. There are more than 25 000 participants on average participating in the “e-Skills Week for Jobs” every year and about 8-10% of them are entrepreneurs. In this event, more than 150 stakeholders were involved and around 700 events are taking place in all regions. The Information Campaign reflects interest and involvement of all stakeholders with respect to e-services. In general, it helps to get the information about new e-services, trainings and also legislation useful for business development and adoption of new ICT opportunities.

Network of State and Municipal Unified Customer Service Centres

<https://www.latvija.lv/pakalpojumucentri>

Significant changes have taken place in society and technology, while assumptions in delivery of public services, earlier approaches and techniques needed to be updated and revised. Therefore, after extensive study and execution of pilot project, the government of Latvia came out with a new approach by eliminating borders in delivery and access of public services by setting up the Network of State and Municipal Unified Customer Service Centers (VPVKAC). This innovative approach of implementing the “one stop shop” principle was a significant change of inter-institutional and inter-governmental cooperation by minimizing distinction between services provided by local governments or state institutions, as well as paying significant attention to development of e-skills and fostering a positive attitude toward self-service.

Particularly, innovation is voluntary involvement of local governments to provide popular “physical/on-site” state institution services and use existing infrastructure/assets and human resources.

VPVKAC focused on needs of citizens and businesses suitable to public administration, i.e. establishment and delivery of the state and municipal services, including e-services. Already one out of two public services is available electronically. Electronic services can be obtained at www.Latvija.lv and in other institutional websites.

The role of leaders at the national or local government level was very important by co-designing and taking decisions to implement multi-channel, multi-government, interdisciplinary and interoperable approach towards the needs of clients and with the efficient use of public funds. Leadership is a necessary characteristic for such kinds of changes in the public, including e-services delivery. Restructuring the delivery of public services in Latvia makes significant contribution to the development of the public service system; thereby reducing administrative burdens, improving the business environment, ensuring availability of services in the regions and promoting more efficient public administration, to optimize the formalities related issues.

59 of 119 municipalities of Latvia are involved in activities of VPVKAC, such as: 1) State Social Insurance Agency, 2) State Employment Agency, 3) State Revenue Service, 4) Register of Enterprises, 5) State Rural Support Service, 6) State Land Service, 7) Office of Citizenship and Migration Affairs, 8) State Labor Inspectorate. Until the end of 2016, 56 VPVKACs were established in development centers of regional importance. From the start of the project in 1st September, 2015, till 1st January, 2017, in all regional VPVKACs a total of 43 204 services were registered and 9 529 consultations provided. At the same time, all regional VPVKACs have registered 3 295 consultations related to services of the State Revenue Service.

Malopolska, Poland

Diversification into non-agricultural activities, and Creation and development of SMEs

Improvement of life quality in rural areas and diversification of rural economy were key issues of the 3.1.1 measure “Diversification into non-agricultural activities” and 3.1.2 measure “Creation and development of SMEs” within Rural Development Program (2007-2013) financed from the European Agricultural Fund for Rural Development. These measures aimed directly at the development of entrepreneurship in non-agricultural activities and changing job profiles in rural areas by giving opportunities to farmers for working in non-agricultural jobs. Various kinds of activities were supported within the measures, i.e. services for agricultural or forestry, services for the local society, sale and retail, craft, construction works and services, tourist services and services related to sports, recreation and leisure, transport services, communal services, manufacturing, storage, production of energy products from biomass, accounting, consulting and IT services.

Support by the measure 3.1.1 is focused on activities registered in rural areas (rural commune, urban-rural commune or rural commune without cities with population above 5 000 citizens) and

persons insured as a farmer were supported within the measure. The maximum amount of support in the form of reimbursement of the costs could not exceed 100 000 PLN. The support level was a maximum of 50% of eligible costs of the project and could cover various types of costs, i.e. purchase of IT equipment and software. Evaluation criteria of the proposals were closely related to location of the beneficiary, mean incomes and unemployment level of the commune at which beneficiary are located. Additionally, the innovative level of the proposal was assessed. About 8508 contracts with the amount of about 180 million Euro were signed within the measure, which gave a big opportunity to change activity profiles in rural areas, including introduction of ICT companies.

Persons or micro-enterprises with up to 9 employees and small economic turnover (below 2 million Euro), which are located in rural areas (rural commune, urban-rural commune or rural commune without cities with population above 5 000 citizens) were supported within the measure 3.1.2. The maximum amount of support in the form of reimbursement of the costs could not exceed 300 000 PLN and were depended on the number of employees which were planned to be hired. The support level was a maximum of 50% of eligible costs of the project and could cover various types of costs, i.e. purchase of IT equipment and software. Evaluation criteria of the proposals were closely related to location of the beneficiary, mean incomes and unemployment level of the commune at which beneficiary are located. Additionally, innovative level of the proposal was assessed. About 4500 contracts with the amount of 180 million Euro were signed within the measure.

Both measures were implemented under the former EU financial perspective (2007-2013). Official assessment by authorities of the measures was not published up to now. Number of assigned contracts suggests that the activities were important for rural areas. Nevertheless, it seems that funds allocated to the activities were too small. Also, the promotion of the program in local environments should be better. The activities will be continued in the new perspective of EU funding. Increasing the accessibility of ICT technologies in rural areas and improving the use and quality will be supported within measure 6 "Promoting social inclusion, poverty reduction and economic development in rural areas" within Rural Development Programme (2014-2020). Especially two kinds of the support will be related to previous Rural Development Programme: the measure 6.2. "Bonuses to start of non-agricultural activities", the measure 6.3. "Assistance to start economic activity for the development of small farms", and the measure 6.4. "Support investment in the creation and development of non-agricultural activities".

Improving e-skills of citizens

Developing e-skills was supported within the measure 9.6.2 "Improving the competencies of adults in ICT and foreign language skills" of the Human Capital Operational Programme for 2007-2013. Selection of the projects and their implementation were independently performed by labor offices at each voivodship in Poland. The projects could have been realized by private companies (enterprises). Trainings and courses were supported only if they were dedicated to adults (from 18 to 64 years old, also older adults if they were unemployed and declared willingness to be employed), especially with low competencies, who have independently taken initiatives in increasing skills and competencies in the areas of ICT skills. The measure was especially focused on improvement of ICT skills in rural areas, because additional points (10 points) within strategic evaluation criteria was given during assessment of the project proposal, which was directed only to adults living in rural areas or in cities with population below 5 000 citizens. Trainings in ICT were finished by certificates which confirmed gaining by participants' competences specified for different levels of European Computer Driving License (ECDL). The level of improvement of skills in ICT by each participant was examined by subjects who were independent from the company which performed the training. The companies which implemented the project received full reimbursement of expenses required for the project implementation, including costs of teaching, competence assessment of the trained adults, etc. The value of public support for the projects related to improvement of ICT skills which were contracted at Malopolska voivodship was about 7 million EUR. 44 agreements were signed with training companies related to ICT. 9793 adults were trained in ICT field (62% persons were come from rural areas, 75% women).

Generally, the activity was assessed positively, but several issues can be pointed out: limited quality assessment of trainings (only by authority), unsuitable (in some cases) matching of the subject and level of training to the students, limited efficiency of fund utilization. Thus, innovative complexed support system "subjective funding of education" for SME employees (2014-2015), which was based

on Wallonia system, was introduced in the pilot project as a part of measure 8.1.1 within Human Capital Operational Programme (2007-2013). The system was clear with simply agreements and payments. Beneficiary (SME) decides about the theme and place of employees' trainings, which means that the system is much more flexible in themes, time and forms of trainings. 164 SMEs benefited from the pilot project, in which 77% were microenterprises, showing a big interest of e-skills improving in the smallest companies. 14 441 vouchers (with value equal to about 0.4 million. EUR) were used. Most of the vouchers were used for short trainings related to professional competencies.

The activity is not directly continued within the project "Career Destination" financed from Regional Operational Programme for the Malopolska Region for 2014-2020 (first stage of the project will be performed in 2016 and 2017). The support for ICT (or language skills) trainings is offered only after advanced evaluation of skills and education level performed for each candidate by a professional advisor. If necessity of ICT trainings is confirmed, the candidate will get financial support for specific training, which will be fitted to the skills and level of the education of the candidate.

Support for creating e-services by SMEs

Development of electronic business sector in Poland was supported by grants offered within measure 8.1. "Support for economic activity as regards electronic economy" of the Operational Programme Innovative Economy (2007-2013). The main objective of the measure was the development of electronic services and digital tools provided by micro and small enterprises registered in Poland and conducting business for no longer than 12 months, which means that the measure supported start-ups. The SME were supported up to 85% of the value of the project, which could range from 20 000 PLN (\approx 5 000 Euro) to 1 million PLN (\approx 250 000 Euro). The maximum duration of the project's support was 24 months. E-service had to be implemented within the project. E-service was defined as service provided partially in automatic way through IT by ICT systems in public ICT networks by individual requests of the client without simultaneous presence of the parties. Nevertheless, providing typical IT services, such as e-mail services, hosting services, etc., was not supported within the measure. The entrepreneurs received co-financing of costs required for project implementation, including the following:

- ❖ the purchase of IT, technical and advisory services leading to the production of digital products and products related to the preparation, provision and update of e-services;
- ❖ the purchase of new fixed assets (except real property), as well as intangible assets in the form of patents, licenses, know-how and unpatented technical knowledge (especially software);
- ❖ remuneration of the people directly involved in project implementation;
- ❖ the purchase of training services related directly to the start-up and support of the electronic service for employees of the beneficiary;
- ❖ the electronic and traditional promotion of the solutions implemented (through i.e. social media, Google AdWords and positioning on the Google searching website); and
- ❖ costs of the advisory services.

The value of agreements contracted at 2008 – 2014 was about 0.3 million euro. About 1650 SMEs were supported within the measure. Various start-ups which provide e-services were developed, implemented and offered on the market due to projects implemented within the measure, i.e. e-learning platform for computer (informatics) training, web-based platform for enterprise managing, web-based system for contracting, registration and accounting dedicated to medical care companies, and passengers of public transport information system.

The idea of the activity and value of the support can be assessed very positively. Nevertheless, risk of project failure (as stated above – most of the SMEs were start-ups) was not taken into account during the framework setting of the measure. Also, revenue expectations (high economic efficiency of the project was required in proposals) in many cases was overestimated. Additionally, overly complicated and detailed rules of co-funding of expenses can be highlighted.

The activity is not continued directly after 2013 on the national level. Nevertheless, some of the regional operational programs may provide similar activities for SMEs support. For example, Regional Operational Programme of Lubusz Voivodeship 2020 (Lubuskie Region) supports introduction of new digital technologies in new e-services, including Internet sales (purchase of hardware, software, IT services, licenses) within the measure 1.5.1 "The development of the SME sector - Support Grant".

Utilizing modern B2B solutions in SMEs

Implementation of B2B systems was supported in the measure 8.2 of the Operational Programme Innovative Economy (2007-2013). The measure was focused on the incorporation of business-to-business systems in micro, small and medium-size enterprises, which enable joint business ventures conducted electronically between companies. The support was directed to SMEs registered in Poland, which can reveal co-operation through civil law contracts with at least two other companies. Tightening cooperation between partners through modern information technologies was promoted through the measure. The support could be obtained by projects of an IT and organizational nature, which led to the implementation of business processes between at least three enterprises. The entrepreneurs had to present business co-operation plans based on electronic solutions through the implementation and integration of new or currently used-IT systems and the automation of the business processes (i.e. ordering, accounting, logistics) taking place between them. The co-financing may be granted for a period of no longer than 24 months. SMEs could receive support, i.e., to:

- ❖ purchase intangible assets (patents, licenses, especially software necessary) to implement B2B solutions;
- ❖ buy new fixed assets strictly related to the project execution, except for real estates;
- ❖ advisory (initial analyzes, expert services, legal and consulting services) involved in the project;
- ❖ buy specialized training for individuals involved in the supported project execution and necessary to implement a B2B solution.

The level of support from the measure depended on kinds of expenses, size of the enterprise and location of the project. Micro and small enterprises were supported at the level of 70% of the eligible expenses for investments, though medium-size companies were supported at the level of 60%. Higher support was assigned only to companies operating at several, less-developed and less-urbanized regions of Poland (mainly southern and eastern regions of Poland). The level of support for training costs was up to 45% for micro and small enterprises and up to 35% for medium enterprises. The level of support for salaries and promotion was up to 85%. Additionally, support for advisory was up to 50%.

The value of agreements contracted at 2008–2015 was above 0.3 million euro. About 2200 SMEs were supported within the measure. The activity is not directly continued after 2013 on the national level. Nevertheless, some of the Regional Operational Programs may support similar activities of SME. For example, Regional Operational Programme of Lubusz Voivodeship 2020 (Lubuskie Region) supports introduction of new digital technologies in new e-services, including Internet sales (purchase of hardware, software, IT services, licenses) within the measure 1.5.1 “The development of the SME sector - Support Grant”.

Sør Trøndelag, Norway

eTrøndelag

The main tool for policy and ICT development activity in Sør Trøndelag County Authority is the eTrøndelag unit (www.etrondelag.wordpress.com). In fact it is a strategy in itself. eTrøndelag is an operative entity in the County Authority Department for Regional Development's branch Innovation and business-development (operative since 2008). This is Sør Trøndelag County Authority's strategic tool for facilitating regional digital development and innovation, and contributes through strategic partnerships and own projects to the creation of new or enhanced services in both private- and public sectors. eTrøndelag has four core priorities: Digital Infrastructure, Digital Municipality, Digital Business development, and Digital Skills. Primary focus is on the operative level, with international/regional project work and FoU as a tool to create new policies.

The County Authority today has a leading role in the development of digital infrastructure in the county. Government grants and cost sharing realized new coverage. Broadband accesses and new base stations for mobile coverage are being developed in areas telecom operators do not find

profitable. The County Authority is also a coordinator between municipalities and telecom industry, facilitating joint exploitation of existing infrastructure without public subsidy. The regional municipalities (35) have recently been organized in DiguT – Digitalisation Council Trøndelag in 2016. Aim is to coordinate digital development in the municipality sector.

As such, the work being done through eTrøndelag has been successful (see good practice description for more detailed results). Taking into account that there has been activity since 2008, one could have wished for more results, particularly on the business development sector. The business development activity is mainly a responsibility for Innovation Norway, which has a lot more financial muscles and human resources for the task. eTrøndelag has had 1 person since 2010 (working mostly with international projects with SME participation, and municipalities), and marginal financial funding. Another reason is also that digitalisation has not been particularly high on the agenda for SMEs until now. There has been a positive shift the last couple of years, however. New policies for different sectors have gradually been developed and implemented in the County Authority's strategy and plan documents thanks to eTrøndelag's contributions.

Digital Cultourist – tourism and digital skills

Digital Cultourist as a policy addresses two important targets in the Sør Trøndelag County Authority: digital dissemination of cultural heritage and increasing digital skills in SME's in the region. Digital Cultourist is a digital tool for guiding tourists and visitors along cultural routes by using their own cell phones along a predefined trail on the map. It is based on geolocation of cultural heritage sites and information related to offers as restaurants, POI's, small scale food producers, art galleries and museums along the trail, etc. Its primary use is in tourism. The aim is to introduce a simple and less time-consuming tool for digital presence/marketing for SME's in rural areas. The html5-based framework enables participating SMEs to add their own pages on the digital map on the cultural route. The interface is built with the purpose that the County Authority supplies the site with cultural heritage content, the municipality administrates the site, and the SMEs get their own pages which they must maintain. There will be arranged small workshops for the SME's focusing on digital content co-creation and marketing - enhancing digital skills.

The framework was completed in May 2016 (built on the experiences from Interreg IVC e_CREATE project, and is designed to serve all municipalities in Trøndelag. Today 3 municipalities are working with content creation and projects related to the Digital Cultourist Framework (www.cultourist.no). This work could (with a conservative estimate) benefit 10-15 SMEs in each municipality, assuming that 20-25 municipalities are a realistic target group. For a SME, not well-known, to be relocated on a route would make it more likely to get visitors. It will also tie the SME to be a part of the "storytelling" of the municipality through the stories presented in the framework along the cultural route. The longer a time a tourist stays in an area, the more money he/she spends. For branding, storytelling increases the likelihood of a SME to sell products for a higher price, as it increases value. Through co-working with content in workshops, digital skills in participating SMEs will increase within their field of business and digital marketing.

There is not enough evidence to say that the practice is a general success for the public, as there are too few users at the time, but the interest generated in the municipalities have been positive. The threshold for the municipalities is the cost of producing high quality content, but the county authority has granted subsidies for some municipalities to develop this. There is also reluctance from eTrøndelag to publish the tool before it has sufficient content inside, and has been tested to some degree in field with common users. Meetings with SMEs have been very positive, and it is planned workshops in autumn 2017. Typically a municipality needs a year to organise and produce content. It is also dependent of the cultural heritage work been done by the municipality in cooperation with the county authority. There substantial funding has been allocated from the county authority for digital dissemination of cultural heritage for 2017-2018, through Digital Cultourist.

Sør-Trøndelag Online

Sør-Trøndelag Online was a pilot-project that offers competence in online/digital visibility for small and medium-scaled businesses. The project has been developed in a cooperation between two business-parks, Sør-Trøndelag County Authority, a local bank and Google. Some of the subjects offered in the pilot were strategy and online message, Google ad words, how to trigger online traffic, social medias, and etc.

The business-parks invited businesses that wanted to be more visible online and connected them with both regional service partners and local bureaus. The intention was that the local bureaus could become service partners in the long run.

38 businesses joined the pilot. The pilot has been evaluated, and one of the conclusions was that the service bureaus should have better knowledge about the businesses, to be sure to meet the needs of the small businesses as well as possible.

Results on a business-level mentioned in the evaluation were:

- ❖ knowledge on how the business or product could pop-up on a google-search;
- ❖ more knowledge about local bureaus and what services they could offer;
- ❖ be a part of a business-network.

On the basis of the evaluation, it has been decided to prolong the project, and the recruitment of businesses started Autumn 2016.

Castilla y Leon, Spain

Innochambers/Innocámaras

This initiative has been successful taking into account that Chambers of Commerce are well known and they constitute an institution that almost anyone would approach when needing information for starting a business. Also, this is a powerful initiative because it has the ERDF support. Specifically, as a result of the initiative, the Chamber helped 151 SMEs through a diagnostic of innovation in their companies, and 108 companies have implemented innovations. Many of those companies related specifically to ICT innovations such as e-commerce, management applications (CRM, ERP ...), creation of web pages to improve visibility of the company and marketing their products or a social media plan that allowed them to connect virtually with clients faster and more efficiently.

Laboratory of social innovation / Laboratorio de innovación social

This initiative is good as it allows peer-to-peer consultations and promotes sharing solutions to similar problems, enhancing collaboration between businesses boosting their capacity to achieve bigger and complex projects. Its main goal is to group about 40 companies and that 50% of them incorporate some ICTs namely Google Talk, Drive or Dropbox.

Rural SME and cultural heritage/ PYME rural y Patrimonio cultural

ADECOCIR has taken advantage of the World Heritage Site of Siega Verde and by using it as a key element, successful initiatives have been developed combining traditional resources with ICT such as virtual tours, online booking, social networks. This has also led to boosting and supporting the creation of new business models in rural areas, promoting the use of the brand and the logo 'Siega Verde'. As a result, new SMEs have implemented ICT tools in their daily routines: 2 rural hotels have created a website to book online, and a cold meat company created a website for online shopping. Regarding specifically to Siega Verde, derived from the availability of broadband and mobile technology implanted in the area, visitors now have the possibility to book visits online, or make a virtual tour. From 2010 to 2015 the number of visitors that booked online doubled. This year a Facebook fan page⁴⁰ was implemented. As a result, guided night visits to the World Heritage Site of Siega Verde have increased from 2 to 7 guided night visits in 2016.