OUTPUT O.T1.1.1
TOOLS AND GUIDELINES FOR ANALYSIS OF THE RIS STATE OF ART IN CONSORTIUM REGIONS

Methodology for Regional Frameworks Analysis with the detailed overview of RIS state of art in consortium regions

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_v01	27.08.2017	Artur Ochojski	All PPs	// aims and scope of the work, draft of the guidelines for framework analysis
_vs02	15.09.2017	Gabriella Bettiol, Federico Crivelli, Celina Solomon	All PPs	// tools and guidelines for framework analysis
_vs)3	20.12.2017	Artur Ochojski, Gabriella Bettiol, Federico Crivelli, Celina Solomon	All PPs	//framework analysis based on the tools and guidelines – a detailed overview of RIS state of art in consortium regions – partner reports and main report

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A. EXECUTIVE SUMMARY

The document informs on one of a series of activities necessary to provide the output O.T1.1.1, namely regional framework analysis. Together with the audit reports in Regional Observatories (ROs), it defines the RIS state-of-the-art in the consortium regions and helps to better identify several key processes underpinning changes of regional economies.

Growth of any local (regional) economy is based on several pre-conditions including the economic potential, specialisation / diversification of the market, political and institutional setting of the regional governance structures and many more. Therefore, the framework analysis described here and provided exclusively by the project, has secured a cross-cutting mapping of regional specificities in all regions of the consortium. It enriches the set of tools and guidelines necessary to initiate and facilitate the process of building the competence map (C-map) and the benchmarking ICT tool (both to be delivered in WPT1). Finally, it is a central part for providing food for thought against the real demand of the end-users of Regional Observatories (as described in WPT2).

Audit reports (II phases)		Competence map
Regional reports based on framework analysis		Benchmark tool
Workshops and other sources of knowledge		Demand overlayer
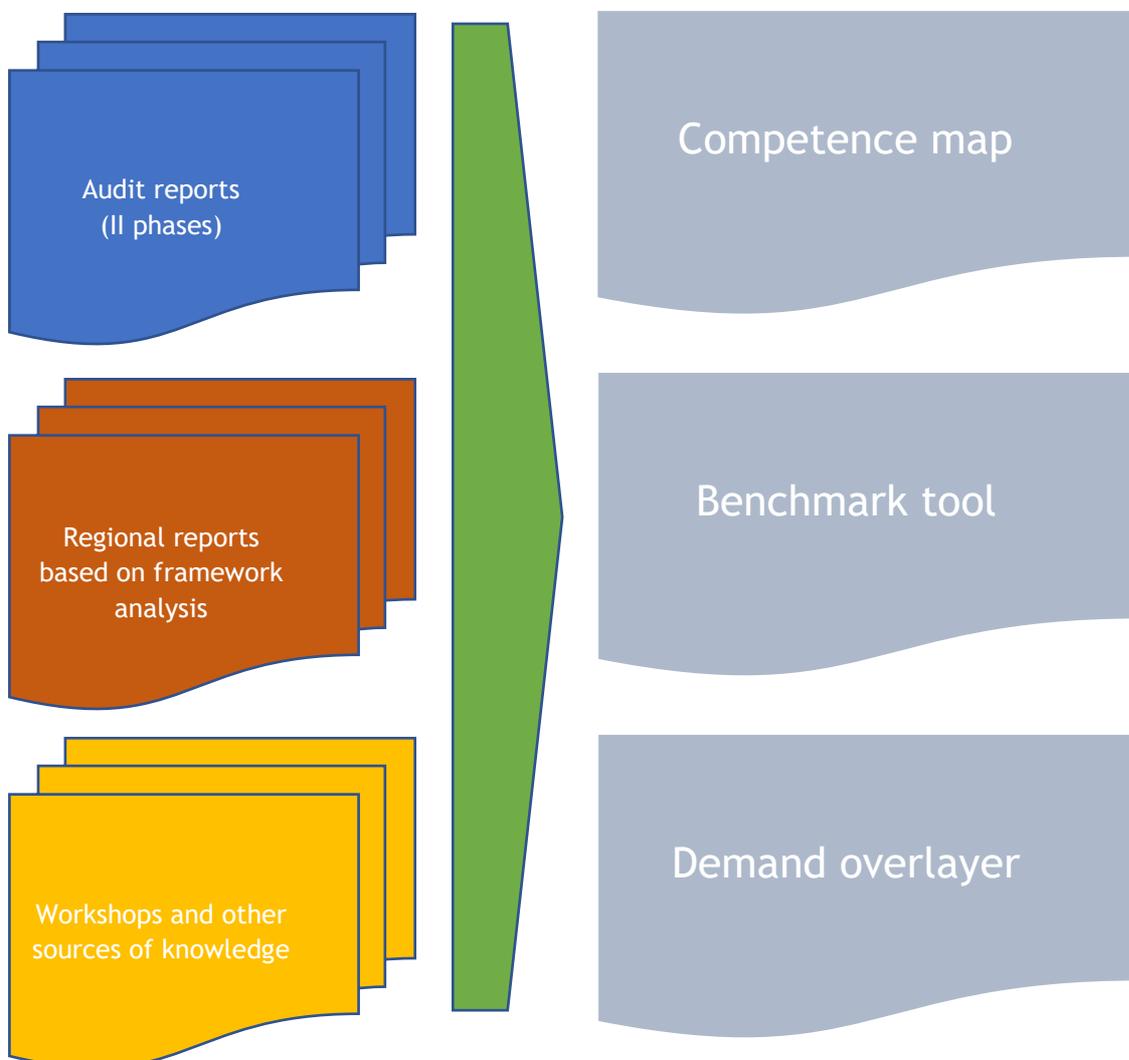
Source: own elaboration

Therefore, we claim that the framework analysis:

- delivers reflections on Regional Observatories as a part of institutional support to bunsiness in regions of CE

- provides Project Partners and Auditors with a sound resume on the economy and business support set witin the regional contexts

- organises knowledge on the role and impact of business support of smart specialisation in CE to better inform the public

- updates decision-makers on the new options towards smart specialisation and the future of business support in regions of CE

- defines the specificity of regional observatories available to business

RESEARCH QUESTION MARKS AND METHODOLOGY

RESEARCH QUESTION MARKS:

What are the differences/similarities of the regions covered by the analysis and what are the factors (socio-economic history, PAs efficiency, cultural biases, manufacturing structures, …), at the basis of the territorial development? (Sections A and B);

How the EU directives stating the structuring and designing processes for regional R&I strategies and their connections with ERDF/other EU funds governance system impact on the Supply Side, with a focus on RIS3 and Smart Specialisation identification? (Section C);

How the Supply has redesigned its R&I offer at regional level in order to achieve the requested resources' prioritarisation exploiting competitive advantages through the development and matching of R&I own strengths to business needs? How this influences the capability to address emerging opportunities and market developments in a coherent manner, while avoiding duplication and fragmentation of efforts (Section D);

According to research evidences of the previous section, how each region has designed and established a functional system to seamlessly monitoring the RIS3 operationalisation, highlighting common practices and functional solutions to similar conditionalities?

The integrated methodological approaches applied are:

A. series of dispersion graphics, along with comments on main evidences.

B, C, D and E ▢ synoptic framework tables, along with comments on main evidences.

The logical process applied is the following:

checking each current regional industrial situation, its backgrounds and evolution trajectories expressed in the past;

comparing the business institutional support developed, according to the regional industrial situation;

observing how each region has reacted to the EU common urge and request to prioritise resources and overall rethinking of the EU funds distribution logic and subsequent management;

comparing the reaction in terms of revisions of the business institutional support on the basis of RIS3 designed, including a specific focus on monitoring processes.

B. METHODOLOGY FOR REGIONAL FRAMEWORK ANALYSIS

The main goal for the provider of this report is to identify as objectively as possible answers to the following questions:

1) What are the dynamics of the institutional support offered to businesses of Smart Specialisation and what are the key elements that build it (*the supply*)?

2) What are the improvement mechanisms set up by the institutional support entities that allow a constant upgrade of the supply made available to the businesses of Smart Specialisation (*the monitoring*)?

3) What is the actual supply made available to businesses of Smart Specialisation due to the Regional allocation of EU funds (*the supply*)?

4) What are the improvement mechanisms set up by the policy-makers that allow a constant upgrade of the supply made available to the businesses of Smart Specialisation (*the monitoring*)?

Working definitions:
- Businesses of Smart Specialisation: firms that belong to Smart Specialisation selected by the Region (a narrow approach) or firms that belong to the value chain of a given Smart Specialisation (a more complex approach)
- Regional Smart Specialisations represent the policy attempt to focus investment and create synergies in a closer collaboration with stakeholders, aiming at enhancing the productive excellences in territorial systems, including the perspective of a global economic context. Smart Specialisation allows the regional governance systems to exploit its economic opportunities and emerging trends, and taking action to boost its economic growth;
- Institutional support offered to businesses of Smart Specialisations: any organization that plays any role for business in the institutional environment linked to Smart Specialisation;
- Institutional environment for business: supplier of knowledge, networking, infrastructure, finance and other forms of commercial or non-commercial services provided to business;
- Regional allocation of EU funds: EU policy-based funding offered by the Region;
- Improvement mechanisms: tools, practices, knowledge that could be used in order to improve the supply provided directly to businesses of Smart Specialisation or supply provided to businesses of Smart Specialisation via institutional environment;
- Improving the supply: delivery of quality and quantity that fits the real needs of businesses/that allows boosting Smart Specialisation by means of business productivity and competitiveness and the growth of Regional economy.

Key parts:
- A. The Region and its economy;
- B. The institutional support in the Region – the evolution;
- C. Smart Specialisations Strategy;
- D. Business institutional environment – the supply;
- E. Business institutional environment – the monitoring;
- F. References and data sources;
- G. Contacts.

BEFORE FILLING IN EACH PART, PLEASE CHECK SECTION F. THIS SECTION PROVIDES LINKS TO WHICH YOU WILL FIND THE DATA, ENSURING A UNIVOCAL SOURCE.

ALL THE CHARACTERS LIMITS ARE WITHOUT SPACES.

PART A. THE REGION AND ITS ECONOMY

This section intends to identify Regional main indicators to obtain a clear overview of the economic structure and its dynamics. This is the context of understanding Smart Specialisation in the Region. The time range to be taken into account is 2005-2017, except for part A.2 Historical changes.

Regional NUTS ID:

A.1 Facts and data on Regional economy

A.1.1 - Main figures

Indicator	Source					
Population (in mln.)	demo_r_d2ja					
Regional GDP (nominal) at current market prices	nama_10r_2gdp					
Regional GDP per capita at current market prices - Euro per inhabitant (EUR_HAB)	nama_10r_2gdp					
Regional GDP per capita Purchasing power standard (PPS) per inhabitant (PPS_HAB)	nama_10r_2gdp					
Regional GDP per capita Purchasing power standard (PPS) per inhabitant in percentage of the EU average (PPS_HAB_EU)	nama_10r_2gdp					
% of National GDP	nama_10r_2gdp					
% of unemployment (2016)	lfst_r_lfu3rt					
N. of local units by NACE rev 2**(dal 2008) – (V11210)	sbs_r_nuts06_r2					
Number of persons employed by NACE rev 2** (V16110)	sbs_r_nuts06_r2					

Share of persons employed by NACE rev 2** on total employed	sbs_r_nuts06_r2					
% of SMEs	Regional/National sources					
Trade Openness Index (Exports + Imports)/(Gross Domestic Product)	Regional/National sources					

* Indicators as "Regional GDP per capita" are not available for the year 2017. In these cases, use the last data available at the sources indicated.

** Detail of NACE rev 2

B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
L	Real estate activities

Source:
- Eurostat - Population on 1 January by age, sex and NUTS 2 region - [demo_r_d2jan],

  N. 1, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_r_d2jan&lang=en
- Eurostat - Gross domestic product (GDP) at current market prices by NUTS 2 regions - [nama_10r_2gdp]

  N. 2 to 6, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10r_2gdp&lang=en
- Eurostat - Unemployment rates by sex, age and NUTS 2 regions (%) - [lfst_r_lfu3rt]

  N.7, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfst_r_lfu3rt&lang=en
- Eurostat - SBS data by NUTS 2 regions and NACE Rev. 2 (from 2008 onwards) - [sbs_r_nuts06_r2]

  N. 8 to 10, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=sbs_r_nuts06_r2&lang=en
- N. 11 to 12, no Eurostat data available. Please refer to Regional Sources.

EU Funding scheme	MFF 2007-2013	MFF 2014-2020
Total ERDF allocation in the region		
Total ESF allocation in the region		

A.1.2 - Innovation

Indicator	2009	2012	2014	2017
Population with tertiary education (ISCED 5-6) per 100 population aged 25-64 (restricted 30-34 for year 2017)				
Participation in life-long learning per 100 population aged 25-64				
International scientific co-publications per million population				
R&D expenditure in the public sector as % of GDP				
R&D expenditure in the business sector as % of GDP				
EPO patent applications per billion Regional GDP (PPS€)				
Employment MHT manufacturing/KIS services[1]				
SMEs introducing product or process innovations as % of SMEs				
SMEs introducing marketing or organizational				

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[1] MHT: Medium-high tech. manufacturing. KIS: Knowledge-intense Services.

innovations as % of SMEs				
SMEs innovating in-house as a percentage of all SMEs				
Non-R&D innovation expenditures as percentage of total turnover				

No data available

Source:
- Regional Innovation Scoreboard year 2009: http://bit.ly/2xGUacO
- Regional Innovation Scoreboard year 2012: http://bit.ly/2eRsqux
- Regional Innovation Scoreboard year 2014: http://bit.ly/2wuLLe2
- Regional Innovation Scoreboard year 2017: http://bit.ly/2eznJZj

A.1.3 – Competitiveness

Indicator	2010	2013	2017
Competitiveness Index rank			
Market size			
Technological readiness (Households)			
Technological Readiness (Enterprises)			

No data available

Source:
- EU Regional Competitiveness Index 2010:
  o For Market size and Technological readiness: http://bit.ly/2wuRSz8 (Annex Regional Competitiveness Index Indicator – Excel file).
- Regional Innovation Scoreboard year 2013:
  o For the Competitiveness Index (rank): http://bit.ly/1zdDvdX (JRC Report pp. 128-131);
  o For Market size and Technological readiness: http://bit.ly/2xHohBd (Annex Raw data - Excel file).
- Regional Innovation Scoreboard year 2017:
  o For the Competitiveness Index (rank): http://bit.ly/2oGfFVD;
  o For Market size and Technological readiness: http://bit.ly/2lXVip0 (Annex Raw data - Excel file).

A.1.3.1 - What are the main changes and dynamics in the sectoral structure of the Region?

Employment by sectors - NACE rev.2 codes – last data available

What are the main changes and dynamics of the number and size of businesses?

Economic structure by sectors - NACE rev.2 codes – last data available

	NACE 2 codes economic activities	Employment (%)** 2005	Employment (%)** 2010	Employment (%) 2017 or last available data**
B	Mining and quarrying			
C	Manufacturing			
D	Electricity, gas, steam and air conditioning supply			
E	Water supply; sewerage, waste management and remediation activities			
F	Construction			
G	Wholesale and retail trade; repair of motor vehicles and motorcycles			
H	Transportation and storage			
I	Accommodation and food service activities			
J	Information and communication			
L	Real estate activities			
M	Professional, scientific and technical activities			
N	Administrative and support service activities			

* If no data are available for the year 2017, use the last data available and indicate the year in the

** Percentage on the total employment. The sum of points from B to N will not be 100%.

	Total n. of companies			of which LE[2]			of which SMEs[3]		
	2005	2010	2017*	2005	2010	2017*	2005	2010	2017*
B									
C									
D									
E									
F									
G									
H									
I									
J									
L									

[2] LE: Large Enterprises.

[3] SMEs: Small and Medium Enterprises. See http://bit.ly/2wkYyzS

M									
N									

*   If no data are available for the year 2017, use the last data available and indicate the year in the column

Provide a brief comment to the data reported in the table above, with reference to the time trend from the year 2005. Please include a specific focus on your regional points of strength and size of enterprises.

max 2.000 ch. without spaces

A.1.3.3 - What are the main changes in the export dynamics (sectors and industries)?

max. 1.000 ch. without spaces

A.1.3.4 - Which are the three main key factors of success/failure in businesses of the region (tech., products, industrial sectors, …)? Please describe the main changes in the key factors above-mentioned.

max. 2.000 ch. without spaces

A.1.3.5 - Changes in unemployment (if significant). What are the main mechanisms that stimulate employment?

max. 2.000 ch. without spaces

A.2 Historical changes

A.2.1 What are the historical changes to the Regional economy of the last 20-30 years (transformation, restructuring processes, shocks, …)?

max. 2.000 ch. without spaces

A.3 Conclusions

A.3.1 Provide a concise summary on the economy of the Region – key messages on the Region for the reader to remember.

max 2.000 ch. without spaces

This section intends to investigate the evolution of the institutional support in the Region and whether it influenced the growth of businesses in the Region (esp. businesses of Smart Specialisation).

B.1 Facts, contexts and data, historical milestones

B.1.1 - Institutional support to R&I and internationalisation in any Region has a history and its contexts, belonging either to the Region or to the country. What is the main approach applied in your Region (bottom up/top down) and how has it changed over the years? How strong is the institutional support in the region and how has it changed?

Provide a description of the history of institutional support in the Region. Think of the territorial, personal, institutional and industrial specificities (business zones, clusters, development agencies, craftsmen associations, leaders, universities, tech transfer and knowledge centres, policy-driven research, etc.).

max. 3.000 ch. without spaces

B.1.2 - Give data and facts on the EU funding impact. Have there been any milestones?

Please refer to the Regional Operational Programme ERDF for Multiannual Financial Frameworks 2007-2013 and 2014-2020. Take into account budget Allocations on Axes related to Innovation and Knowledge Economy and focus on differences and relevant changes between the two programming periods highlighted by the two Regional Operational Programs.

max. 3.000 ch. without spaces

B.2 Conclusions

Provide concise summary and key messages on the dynamics of the institutional support.

max. 1.000 ch. without spaces

PART **C. SMART SPECIALISATION STRATEGY**

This section intends to investigate the main features of the RIS3. The aim is to understand how and with what timing the strategy has been designed (what methodology has been applied, what kind of pivotal players and stakeholders have been involved, tools used, the interconnections between institutions and industrial environments)

The data required allow us to obtain a clear and immediate overview of the Smart Specialisations selected in your region, along with its designing process as "entrepreneurial discovery path" implemented.

C.1 Facts, contexts and data, historical milestones

C.1.1 - Provide a brief description of the Smart Specialisation selective process. How were the Smart Specialisations selected and what were the key actors responsible?

max. 3.000 ch. without spaces

C.2 Smart Specialisation overview

Name of SS	Description	Capabilities	Target Markets	EU Priorities
	…			

Use the data available on S³ platform: http://bit.ly/1j59okb

C.3 Smart Specialization and business environment

C.3.1 - Smart Specialisation means a new way to conceive business competitiveness. Please comment the above-mentioned Smart Specialisation Strategy focusing on the connection between traditional productive sectors and the KIBs, TTOs[4] and R&I actors. If significant, provide examples of how Smart Specialisation Strategy impacted the structure of the value chains in your region (exports, trade, employment or other aspects of regional economy).

max. 4.000 ch. without spaces

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[4] TTO: Technology Transfer Office and similar

You may wish to use sources such as: http://themasites.pbl.nl/eu-trade/.

C.4 Conclusions

Provide concise summary and key messages of Smart Specialisation in your Region.

max. 1.000 ch. without spaces

PART D. BUSINESS INSTITUTIONAL ENVIRONMENT – THE SUPPLY

This section intends to investigate how the support to businesses of Smart Specialisation is offered and who is the provider. The aim is to obtain a clear overview of the offer in the Region collecting information on quantity, range and quality of the offer.

D.1 Data and description

D.1.1 - Name the providers of the support to businesses of Smart Specialisation and describe in details the offer available in your Region. Provide information on quantity, range and quality of the offer.

Key Service Provider	Type[1] and Nature[2] of the Org.	Typology and quantity of the service	Beneficiaries. Typology and quantity	Access to services[3]

		e s o f f e r e d		
	… . . .			

1. By way of example: Development Agencies, Competence and training centres, …

1. Public/Private no profit/Private commercial

3. For free/For a Fee

For Key Service Provider offering access to services for free, please specify the source of funding (if possible)

D.1.2 - Highlight the most common offers supplied to the businesses of Smart Specialisation and pinpoint how the selection is made.

Make sure to provide information whether the offers are made available exclusively due to the EU allocation or if they were commercially offered or whether they belong to any other funding scheme (national, civic, academic, etc.).

max. 3.000 ch. without spaces

Exemplary categories of supply:

- Knowledge provision and dissemination (new technologies: R&D, innovation, prototyping, demonstration, technology transfer, environmental standards, links to innovation and research centres and universities, access to business intelligence and technology trends expertise, …);

- Infrastructure (research and development, databases, production and logistics facilities, administrative centres, …);

- Financial opportunities (financial programs and investment opportunities not funded with EU resources, guarantees, seed capital, venture capital funds, co-investment mechanisms, banking and packages for start-ups, micro-credits, …);

- Networking arrangements (any matching schemes between entrepreneurs and financial or technology organisations, investment forums, meetings and events, …);

- Advice and training (any form);
- Territorial organisation of businesses (districts, zones, clusters, …);
- Other.

D.2 Conclusions

Provide concise summary and key messages on the supply offered to businesses for Smart Specialisations.

max. 1.000 ch. without spaces

PART **E. BUSINESS INSTITUTIONAL ENVIRONMENT – THE MONITORING**

This section intends to investigate the main features of the 'monitoring' of business' support supply in the Region. This is to identify:
- how does the identification of the support of supply to businesses of Smart Specialisations takes place in the Region and whether it is given any constant monitoring;
- whether and how it is implemented towards the RIS3.

The aim is, thus to understand whether and by whom the challenge of meeting the needs of business support services used by companies is handled in the Region, and identify potential areas of further investigation and improvement regarding the delivery of time, range, price and quality of service/infrastructure to businesses of Smart Specialisation.

E.1 Description of practices

E.1.1 - Appointment

What are the typical features of business support supply used by business support providers in the Region? Is it particularly linked to the RIS3? Is there any formally appointed specific organisation (or more than one), to carry out a monitoring of supply activity? If yes, please indicate the organisation\s, providing brief information on their nature.

max. 1.000 ch. without spaces

If no organisation\s are formally appointed, please indicate who is in charge at the moment (if any), to carry out the monitoring activity.

max 1.000 ch. without spaces

E.1.2 - Process and methodology. Description of practices

Please provide information on tools, activities, procedures, timeframe primarily used to identify the support services to businesses of Smart Specialisation, regardless they are formally set-up or they are used informally.

Typically, the examples would include: networking events, evaluation questionnaires, market analysis, business audit, etc.

max. 4.000 ch. without spaces

E.1.3 - Weakness points and possible improvements

Think of the market as the regulator and of the decision-makers in the Region as the ones responsible for monitoring. Think of the business institutions and their links to the businesses. Are there, in your opinion, weakness points to be highlighted at the present stage? What are feasible solutions for improvement?

max. 3.000 ch. without spaces

You may wish to use the categories of supply already described and provide us consequently with the knowledge on the particular mechanisms of improvement.

E.2 Conclusions

Provide concise summary and key messages of the used and still necessary mechanisms to supply that is offered to businesses of Smart Specialisation.

max. 1.000 ch. without spaces

F. REFERENCES AND DATA SOURCES

Here below the list of data sources per section. Please use the sources indicated to fill in each section when necessary. This will allow the use of univocal data structure and ensuring a valuable benchmarking activity.

PART A – THE REGION AND ITS ECONOMY

A.1.1 Main figures

- Eurostat - Population on 1 January by age, sex and NUTS 2 region
  http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_r_d2jan&lang=en

  [demo_r_d2jan]
- Eurostat - Gross domestic product (GDP) at current market prices by NUTS 2 regions
  http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10r_2gdp&lang=en

  [nama_10r_2gdp]
- Eurostat - Unemployment rates by sex, age and NUTS 2 regions (%)
  http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfst_r_lfu3rt&lang=en

  [lfst_r_lfu3rt]
- Eurostat - SBS data by NUTS 2 regions and NACE Rev. 2 (from 2008 onwards).
  http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=sbs_r_nuts06_r2&lang=en

  [sbs_r_nuts06_r2]

For questions A.1.2.1 and A.1.3.2 only national data is available on Eurostat.

You can use your own regional statistics sources.

For table related to Multilateral Financial Frameworks 2007-2013 and 2014-2020 allocation, please refers to your own Regional Operational Programs.

A 1.2 Innovation

- Regional Innovation Scoreboard year 2009: http://bit.ly/2xGUacO
- Regional Innovation Scoreboard year 2012: http://bit.ly/2eRsqux
- Regional Innovation Scoreboard year 2014: http://bit.ly/2wuLLe2
- Regional Innovation Scoreboard year 2017: http://bit.ly/2eznJZj

A 1.3 Competitiveness

- EU Regional Competitiveness Index 2010:
  o For Market size and Technological readiness: http://bit.ly/2wuRSz8 (Annex Regional Competitiveness Index Indicator – Excel file).
- Regional Innovation Scoreboard year 2013:
  o For the Competitiveness Index (rank): http://bit.ly/1zdDvdX (JRC Report pp. 128-131);
  o For Market size and Technological readiness: http://bit.ly/2xHohBd (Annex Raw data - Excel file).
- Regional Innovation Scoreboard year 2017:

- o For the Competitiveness Index (rank): http://bit.ly/2oGfFVD;
- o For Market size and Technological readiness: http://bit.ly/2lXVip0 (Annex Raw data - Excel file).

For Market size and Technological readiness indicate the average of the value of the sub-indicators.

PART C – SMART SPECIALISATION

C.2 – Smart Specialisation overview

Use the data available on S^3 platform: http://bit.ly/1j59okb

C.3 - Smart Specialization and business environment

C.3.1 Use sources such as: http://themasites.pbl.nl/eu-trade/.

G. CONTACTS

For any question and support, please contact via email only:

Organisation	Contact	Email address
PP1 – LP GAPR	Dr. Artur Ochojski	aochojski@gapr.pl
PP7 Confindustria Veneto SIAV S.p.A.	Ms. Gabriella Bettiol Mr. Federico Crivelli	area.progetti@siav.net

C. SECTION A – The region and its economy: mapping results

Our aim is to propose a comparison amidst the different regional situations by analysing their positioning with respect to the variables: Manufacturing Intensity, Innovation and Propensity to Export.

The analysis of the quantitative data provided will be represented by dispersion graphics, taking into account on the Axes the EU average. This will allow us to group regions in clusters on the basis of their positioning with respect to the EU Average and then to focus on how the business institutional supports diverge/converge:

A. within the same cluster, amidst different clusters, along with the relations between them and the RIS3/Smart Specialisations established;
B. between regions with the same smart specialisation in all clusters identified.

According to the clusters identified, we will also take into account the economic backgrounds and the economic/institutional evolution in the last 30 years, in order to understand how these features have impacted on the territorial developments and the related institutional supports.

Do similar systems develop a similar smart specialization strategy? In order to answer this question we have to clarify two aspects. The first concerns the concept of similarity between regional economic systems. The second deals with the problem of classifying different smart specialization strategies and will be discussed in section C of the document.

Data collected through the report "The region and its economy" highlight substantial differences between the regions involved in the project. Unemployment rates vary from 3.1% in Jihozápad to 9.4% in Piedmont. (Figure 1)

Unemployment rate 2016, (15 to 74 years, %)

Source: Eurostat - Mecklenburg-Vorpommern: data 2007, 2011, 2014, 2017
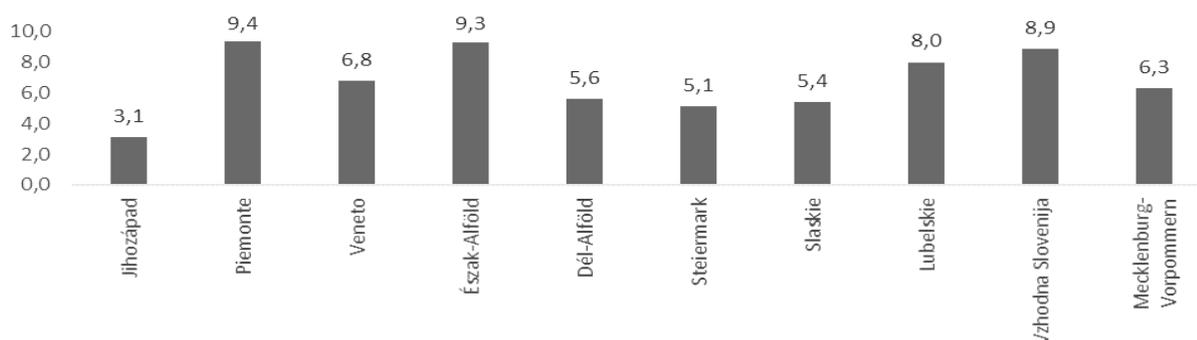
The GDP analysis (Purchasing power standard per inhabitant in percentage of the EU average) shows three groups of regions. The first group (Veneto, Piedmont and Steiermark) is characterized by a GDP higher than the European average. The regions belonging to the second group (Jihozápad, Slaskie, Vzhodna Slovenija and Mecklenburg-Vorpommern) have a GDP around 70% of the European average. The third group consists of regions with a GDP lower than half of the European average (Lubelskie, Észak-Alföld, Dél-Alföld).

Purchasing power standard (PPS) per inhabitant in percentage of the EU average (2006-2015)
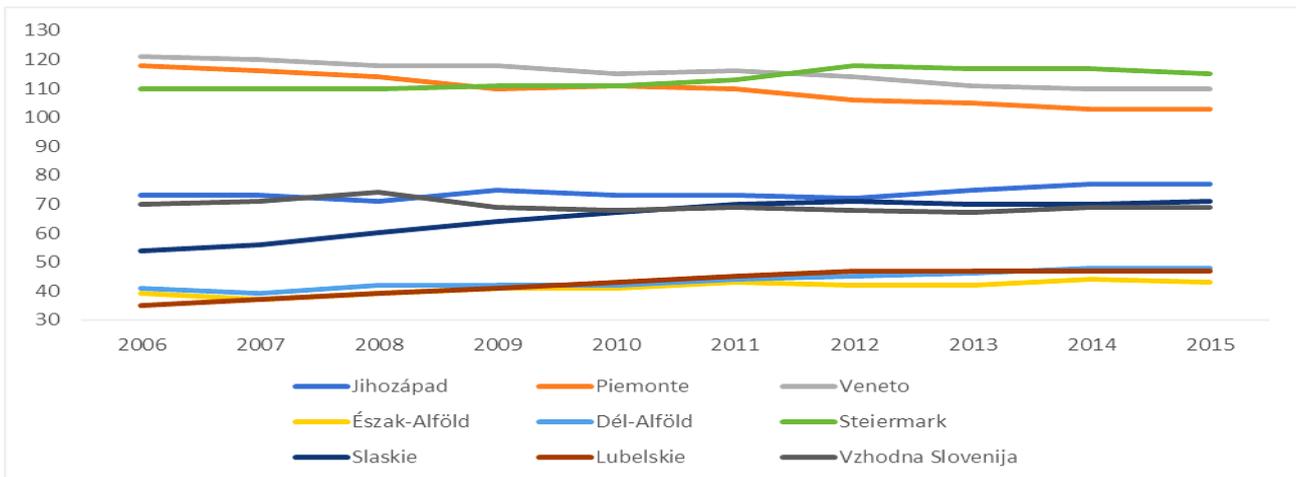
Source: Eurostat

However, unemployment rate and GDP help to identify the state of an economic system rather than its specializations. Coming to the initial question, we should implement a method of analysis that describes the structural features of an economic system. The simple interpretative model includes two variables: specialization, and propensity to innovation. The first variable is measured, for each region, by the ratio between the number of employees in manufacturing sector and the total number of employees in 2015. The second is measured by the 2015 Regional innovation index (Regional innovation scoreboard).

Manufacturing (specialization) index	Innovation index
$$\frac{Manufacturing\ (Number\ of\ persons\ employed)}{Number\ of\ people\ employed\ (15\ years\ or\ over)}$$	Regional Innovation Scoreboard 2017 RII - Regional innovation index 2015 - Relative performance to EU in "2011"

Using the two indexes, it is possible to classify European regions according to their propensity to innovation and manufacturing specialization.
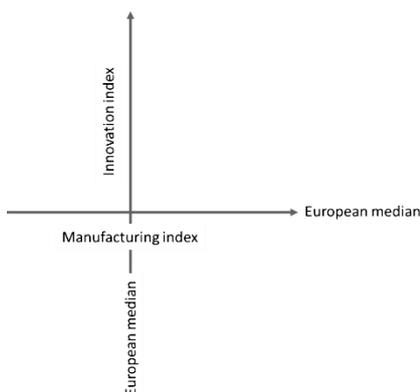
In the upper right corner there are regions characterized by a higher level of innovation than the European average and a high index of manufacturing specialization.

In the lower right corner, there are regions with high manufacturing specialization but low innovation. In the top left corner, high innovation and low manufacturing specialization.

Bottom left low innovation and low manufacturing specialization.

We calculate the manufacturing specialization index for 254 European regions. The median value is 11.9%. The highest value is that of the CZ07 region - Strední Morava, where the ratio between manufacturing employment and total employment reaches 31%. Seven of the 10 regions involved in the project have a higher manufacturing specialization than the European average, above the third quartile (17,2%). Észak-Alföld has a value between the median and the third quartile, while Lubelskie highlights a low manufacturing specialization with lower value than the first quartile.

Manufacturing index

REGION	MANUFACT. INDEX
CZ03 - JIHOZÁPAD	27,9
ITH3 - VENETO	24,8
SI03 - VZHODNA SLOVENIJA	23,5
ITC1 - PIEMONTE	19,6
PL22 - SLASKIE	19,1
HU33 - DÉL-ALFÖLD	17,8
AT22 - STEIERMARK	17,7
HU32 - ÉSZAK-ALFÖLD	15,9
DE80 – MECKLENBURG-VORPOMMERN	10,9
PL31 - LUBELSKIE	8,4

In terms of innovation, amongst the 10 regions participating in the project, the one with the highest innovation index is Steiermark[5] (118). In Europe, the median value of the index is 83.4 (p25 61.6 and p75 118.2). Lower values than the first quartile are found in Észak-Alföld, Śląskie and Lubelskie.

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[5] We used nuts level 1 index AT2.

Innovation index

REGION	INNOVATION INDEX
AT22 - STEIERMARK	118,0
DE80 – MECKLENBURG-VORPOMMERN	108,1
SI03 - VZHODNA SLOVENIJA	89,1
ITC1 - PIEMONTE	84,2
ITH3 - VENETO	84,1
CZ03 - JIHOZÁPAD	81,0
HU33 - DÉL-ALFÖLD	62,2
HU32 - ÉSZAK-ALFÖLD	58,1
PL22 - SLASKIE	51,1
PL31 - LUBELSKIE	46,6

The innovation index is calculated for 155 European regions. The chart shows the position of the nine regions compared to the 155 European regions. In the upper right area, the two German regions Stuttgart and Tubingen (in the red square) have a high manufacturing specialization combined with a high innovation index. In the green square, the Utrecht region is characterized by a high rate of innovation and low manufacturing specialization.
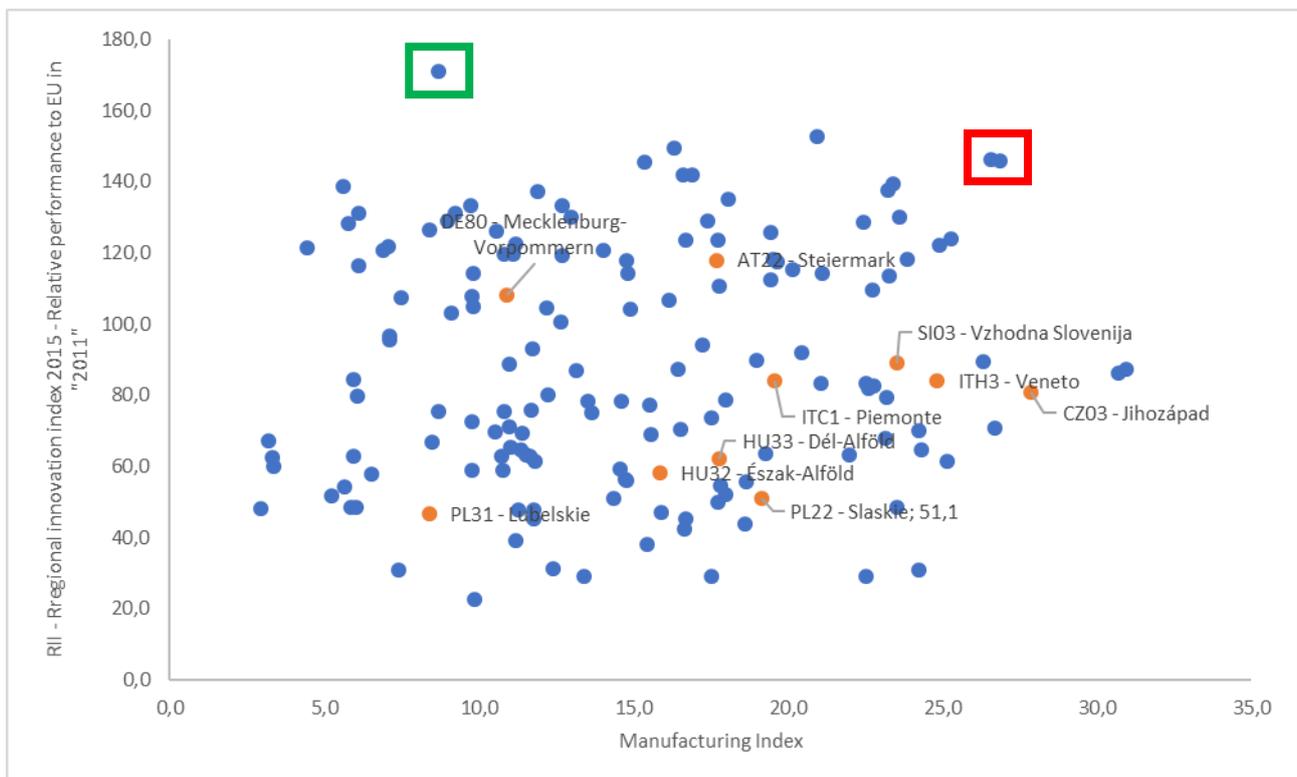
The analysis highlights the existence of four groups of regions. The largest (group 1) is composed by regions with a high level of manufacturing specialization and an index of innovation close to the median value. The second group (group 2) is characterized by regions with a high index of manufacturing specialization but innovation indexes below average. Two regions are characterized by having significantly different values compared to others. Steiermark has a significantly higher innovation index than other manufacturing specialization regions. Lubelskie is characterized by a low innovation index with a non-manufacturing production specialization. Mecklenburg-Vorpommern has a significantly higher innovation index than other non-manufacturing specialization regions.
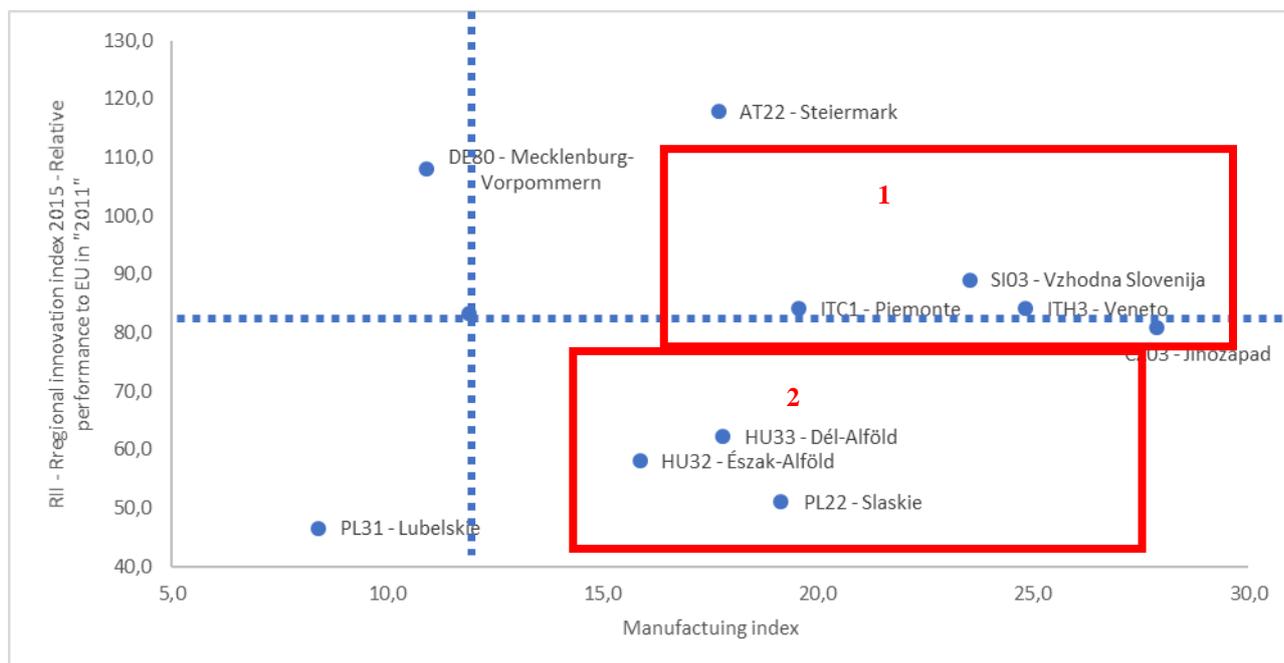
We should now see whether similar regions have developed similar smart specialization strategies.

D. SECTION B - The institutional support in the region – the evolution: mapping results

This section aims at presenting the level and range of institutional support offered to business. Therefore, looking for ideas on how to increase the efficiency of regional RIS3 observatories we wanted to know how meaningful the evolutionary changes of the support provided to business in consortium regions are.

The insights into the regions and their institutional support could be summarised as follows:

Slaskie, PL	historical evidence of support dates back to 19oo; soft and hard infrastructure developed; sector-based support; academic support only strong in some fields; RIS set-up in early 2ooo with strong impact on the milieu at the beginning; EU funding-enhanced
Lubelskie, PL	unclear as of historical path; soft infrastructure pre-dominates; meaningful EU-funding
Northern Great Plain, HU	highly centralised; historical evidence dates back to 195o (nuclear institute); university (Debrecen) plays major role; meaningful EU-funding
South Great Plain, HU	highly centralised and thus regional evidence is not identified
Mecklenburg-Vorpommern, DE	unclear as of historical path; successful absorption of EU-funding
Veneto, IT	industrial support prioritised in last 20 yrs.; new patterns after 2014 with the RIS3; more university-industry linkages available now; EU-funds change (from fragmented to more aggregated financing)
Piedmont, IT	R&I prioritised (2001 law & 2005 strategy; 2006 system for R&I); Tech platforms and Inno hubs based on EU-funding (2007+) and RIS3 (2014+); high concentration of support
Eastern Slovenia, SI	ministry support; university and public research organisations play a role; strong role of EU funds up-till 2013
Styria, AT	support based on strong links with university (impulse centers, uni TTs, CoE, …) and the clustering initiatives; EU-funding rather imporant since 1995
Jihozapad, CZ	clusters and tech parks are the youngest structures with offering support; dev. agencies and universities plus national institutes are the oldest; high impact of EU-funding on BSOs livability

Source: synthesis based on partners' reports

As a conclusion, we need to stress that most of the regions show a growing interest in supporting the economy by historically enforcing its institutional structures. Nevertheless, it is still unclear to what extent the support is meaningful to the businesses and to the growth changes. Definitely, the Italian and Austrian examples highlight different approach towards the linkages among the entities forming their ecosystems. Centralised or formerly centralised national systems might have stopped the processes and evolution of the institutional support somehow is limited to branch-based ecosystems. The regions originating from the countries are claiming to be a real beneficiaries of ERDF funding.

Further documentation provided by partners might be needed to better understand the processes behind the path dependency of regional economic growth but the tendencies revealed in the synthesis clearly show there is a reason to make a different benchmark to southern-belt regions (Austria and regions of Italy) and to the northern regions of CE.

E. SECTION C - Smart Specialisations Strategy: mapping results

The main objectives of this Section are:

- to offer to the reader an analysis of the RIS3s and SSs identified by each region covered by the project consortium within the Central Europe area. RIS3 are defined as integrated, place-based economic transformation agendas that focus policy support and investments on key challenges and needs for knowledge-based development, building on national/regional strengths, competitive advantages and potential for excellence (European Commission, 2012). Regional diversification is one of the key processes such strategies should build upon, with the aim of developing distinctive new areas of specialisation for the future;[6]

- to propose an aggregation in area and macro area of specialisation of the SSs, starting from the punctual scientific and economic domains, linked to the policy objectives targeted by each region. Subsequently, we propose some food for thought about main evidences arising from the aggregation, along with considerations on pivotal elements of the RIS3 policy logic: relatedness and connectivity;

- to investigate the linkages, dependences, interrelations between RIS3 priorities identified at each regional level and the how territories and markets are included in global value chains.

The Regions (NUTS2 or NUTS3 areas, Slovenia), which are under examination, have indicated a total of n. 48 Smart Specialisations (SS), each one linked to specific economic domains, scientific domains and policy objectives.

Preliminary considerations are possible before analysing in depth each approved strategy.

Firstly, it is possible to identify a shared trend amidst the regions to broad the initial concept of Smart Specialisation, in the attempt to widen the number of bodies and economic areas further included in calls, initiatives and tenders aiming at operationalise the Regional Innovation Strategy.

In addition, it is not possible to identify a homogeneous approach in describing the subdomains of each SS. Accordingly, similar technological domains are described in a different way or, alternatively, the same "label" is used to indicate different specialisation areas.

By way of example, some of the regions involved refer to specific economic fields instead of technological domain. It is possible also to highlight the wide variety in terms of the "extent" of RIS3s, taking into account the number of SSs selected.

The "sample" analysed also shows divergences in terms of approach to relatedness and connectivity amidst Smart Specialisations. The term relatedness means here the potential relations amidst specialisations domains within the same region; the term connectivity means here the potential relations amidst specialisations domains selected by different regions under examination.

Many of the regions under examination have not analysed in depth the relatedness amidst scientific and economic domains within their own RIS3 and their connectivity with the SSs of the main economic Partners at EU level.[7]

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[6] Ron BOSCHMA, Carlo GIANELLE, *Regional Branching and Smart Specialisation Policy*, JRC Technical Report, S3 Policy Brief Series N. 06/2014, Publications Office of the European Union, Luxembourg, p. 4. Available at http://bit.ly/2jaZQFu.

[7] On this specific issue see also, Ron BOSCHMA, Koen FRENKEN, *Technological Relatedness and Regional Branching*, in Harald BATHELT, Dieter F. KOGLER, Maryann FELDMAN, *Beyond Territory: Dynamic Geographies of Knowledge Creation, Diffusion and Innovation*, Routledge, London, 2011, pp. 64-81.

By way of example:

- the NUTS2 PL22 Śląskie Voivodeship applied a two-core logic, taking into account the ability to engage in specific values chains for related thematic areas rather than domination of industries, scientific, technological or educational specialisations. Furthermore, a foresight methodology was adopted in order to maximise the long-term impact of RIS3 and to facilitate subsequent reviews and adaptations;

- the NUTS2 ITH3 Veneto Region identified for each SS selected a list of "traditional sectors" and "transversal sectors" on which the new knowledge developed will positively impact;

- the NUTS2 ITC1 Piedmont Region identified a set of connections amidst the SSs selected.

In order to increase the connectivity among regions and, therefore, the related capability to exploit the potentiality offered by the each RIS3, some Countries foresee national clusters focused on specific technological groups. By way of example, In Italy most of the Regions joined National Technological Clusters involving (at least in the forecast), all R&D players: companies, universities and research centres, PAs (quadruple helix approach). Considering the two Italian regions covered by the project Veneto and Piedmont, the situation is the following:

- The NUTS2 ITH3 Veneto Region has joined at least 1 National Technological Cluster per each SSs selected (4);

- The NUTS2 ITC1 Piedmont Region has joined at least 1 National Technological Cluster per each SSs selected (6).

All in all, the regional PAs responded positively to the "stimulus" of the national ministries, but specific subdomains of specialisation remain uncovered.

A lack of specific focus within each RIS3 to the potential relatedness and connectivity could weaken the implementation of regional policies to foster R&D, due to the high relevance of ties of knowledge between different sectors at the same territorial level and beyond (related variety).

Within the general framework and operative guidelines provided by the European Commission[8], each region has declined the six-steps path proposed (analysing the innovation potential; setting out the RIS3 process and governance; developing a shared vision; identifying priorities; defining an action plan with a coherent policy mix; monitoring and evaluating), focusing on specific topics or logics.
The margins of regional autonomy (both in terms of SSs identification and the selective process/methodology itself), were also different from country to country, on the basis of the relationship between national and regional governance systems in defining the RIS3:

- In Hungary, the RIS3 has been considered as a complement of the Invest in the Future – National Research and Development Strategy (2013-2020).[9] The Ministry of National Economy (NGM) overall coordinated the regional designing processes and validated related structural aspects paving the way for the National Smart Specialisation Strategy;

- In Slovenia, two ministries (Ministry of Education, Science and Sport and Ministry of Economic Development), with the Government Office for Development and European Cohesion Policy (SVRK), coordinated the RIS3 throughout the preparatory and designing phase. In addition, two new agencies were set up: Slovenian Research Agency and the Public Agency for Entrepreneurship, Internationalization, Fore-ign Investments and Technology (SPIRIT);

- in Cech Republic, each RIS3 at NUTS2 level has been designed according to a unified methodology given by the government.

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[8] European Commission, *guide to Research and Innovation Strategies for Smart Specialisations (RIS3)*, May 2012.

[9] Future – National Research and Development Strategy (2013-2020): http://bit.ly/2hET3U8

In the Table here below, we tried to harmonise the domains of specialisation reported by partners, aggregating economic and scientific subdomains and policy objectives in a short-list of shared macro areas, in view of a benchmarking activity and to facilitate auditors work on desk and on spot at regional observatories' premises.

Reg	N-	Specialisation Domains	Areas of Specialisation	Macro areas of Specialisation
SI	1	Smart Mobility	Public/Freight Mobility and Logistic	Transport and Logistic
AT	2	Mobility	Public/Freight Mobility and Logistic	
DE	3	Mobility	Public/Freight Mobility and Logistic	
IT	4	Creative Industries	Artistic, Creative and Cultural Industries	Artistic, Creative and Cultural Industries
SI	5	Sustainable Tourism and Creative Cultural and Heritage-Based Services	Artistic, Creative and Cultural Industries	
HU	6	Agricultural Innovation	Agrifood	Agrifood
IT	7	Smart Agrifood	Agrifood	
SI	8	Sustainable Food Production	Agrifood	
HU	9	Healthy and Local Food	Agrifood	
DE	10	Nutrition	Agrifood	
IT	11	Sustainable Living	Agrifood	
PL	12	ICT and Automation	Advanced Manufacturing	Manufacturing
HU	13	Smart Production		
IT	14	Smart Manufacturing		
IT	15	Made in Piemonte: Textile and Fashion, Food, Style and Design		
IT	16	Mechatronic		
SI	17	SI_Ndustry 4.0 Smart Factories		
IT	18	Aerospace	Aerospace	
IT	19	Automotive	Automotive	
HU	20	Advanced Technologies in the Vehicle and Other Machine Industries	Automotive	
PL	21	Chemicals	Chemicals and Advanced Materials	
DE	22	Sustainable Production Techniques and New Material especially in Engineering	Chemicals and Advanced Materials	
SI	23	Development of Materials as Products		
PL	24	Bioeconomic		

HU	25	Sustainable Society	Social Environment and Sustainable Living	Medicine, Health and Sustainability
HU	26	Sustainable Environment		
HU	27	Inclusive and Sustainable Society		
IT	28	Sustainable Living		
DE	29	Sustainable Production Techniques and New Material especially in Engineering		
IT	30	Life Sciences		
DE	31	Health and Life Sciences		
SI	32	Smart Cities and Communities		
SI	33	Networks for the Transition to Circular Economy		
SI	34	Sustainable Food Production		
PL	35	Medicine	Medicine and Health	
PL	36	Medicine and Health		
HU	37	Healthy Society and Wellbeing		
DE	38	Health and Life Sciences		
AT	39	Health-Tech		
PL	40	Energy	Energy	Energy and Environment
DE	41	Energy and Climate	Energy	
AT	42	Green-Tech	Energy	
PL	43	Low Carbon Emission - Energy	Natural Resources	
HU	44	Clean and Renewable Energies	Natural Resources	
SI	45	Smart Buildings and Homes	Natural Resources	
SI	46	Networks for the Transition to Circular Economy	Natural Resources	
IT	47	ICT	ICT	ICT
DE	48	ICT		
HU	49	ICT and services		

HU	50	System Science	Transversal
CZ	51	Human Resources Support	
CZ	52	Business and Innovation Support	
CZ	53	Support for R&D	

In detail, seven macro areas of specialisation emerged from the data aggregations:

- Transport and Logistic;

- Artistic, Creative and Cultural Industries;

- Agrifood;

- Manufacturing;

- Medicine, Health and Sustainability;

- Energy and Environment;

- ICT,

out of which 3 of them result preponderant:

- 16 out of 48 SSs can be referred to "Medicine, Health and Sustainability" (11 "Sustainable Environment and Sustainable Living" and 5 "Medicine and Health");

- 12 out of 48 SSs to "Manufacturing" (6 "Advanced Manufacturing", 1 "Aerospace", 2 "Automotive", 3 "Chemicals and advanced materials");

- 7 out of 48 SSs to "Energy and Environment" (3 "Energy" and 4 "Natural Resources").

Hence, three prevalent macro areas of specialisation identified appear in line with the general trend arisen at EU level and analysed directly by the JRC[10] though the establishment of 3 (so far), Thematic Platforms: Agri-food, Energy and Industrial Modernisation. The Regions covered by the partnership consortium are therefore included in the main development and R&I strand at EU level and could largely benefit from the establishment of durable and functional linkages with other EU regions sharing similar SSs.[11]

In applying the proposed model, we opted for a three-steps fine-tuning process in order to progressively aggregate partners' RIS3s in order to collect all territorial specificities. Here below the pattern applied (Iacobucci, Guzzini, 2016):

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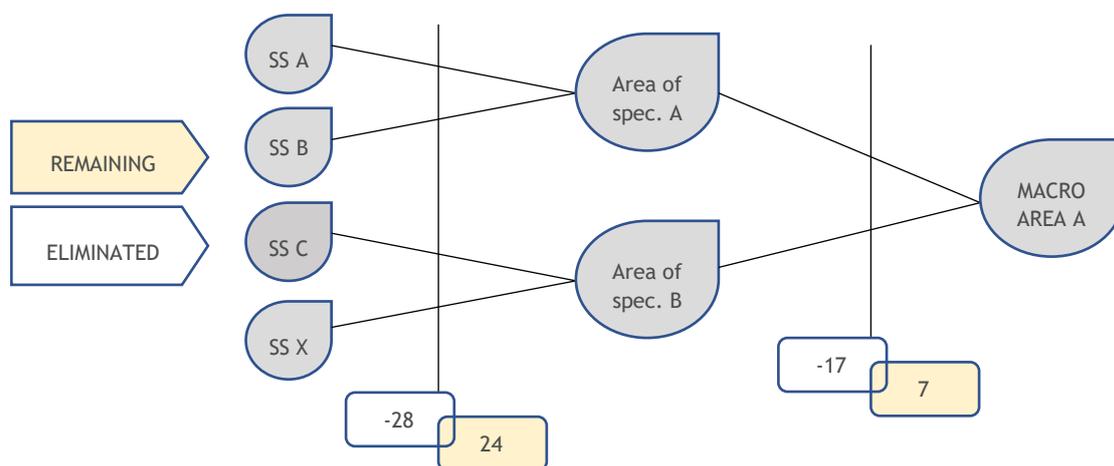
[10] JRC - Institute for Prospective Technological Studies, Seville, Spain.

[11] On the 2nd of June 2016, during the Smart Regions conference, the European Commission has launched two Smart Specialisation Platforms: for Industrial Modernisation and Agri-Food, in addition to the existing S3 Platform for Energy. These initiatives are to offer hands-on support to regions to foster interregional cooperation based on matching smart specialisation priorities related to these three areas, such as Key Enabling Technologies, service innovation or resource efficiency. Particular support will be given to regions to combine different EU investment instruments, such as the European Structural and Investment (ESI) Funds, COSME, Horizon2020 and the European Fund for Strategic Investments (EFSI), the heart of the Investment Plan. More information available at: http://bit.ly/2zaOl84.

This evidence is in line with the analysis of the data collected within Section A of the report (ved. *intra* p. XX), where the Manufacturing Intensity has been evaluated as one of the two main variables to benchmarking different regional positioning compared to the EU average.

Transveral SSs	4
ICT	3
Energy and Environment	7
Medicine, Health and Sustainability	16
Manufacturing	12
Agrifood	6
Artistic, Creative and Cultural Industries	2
Transport and Logistics	3
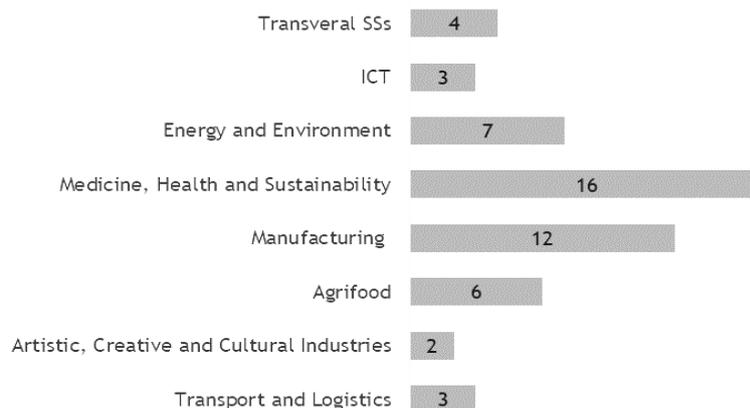
Due to the features of the Smart Specialisations, many of the "labels" composing each RIS3 under examination can be referred both to specific industries and punctual economic domains (e.g. "Automotive" and "Aerospace") or to wider scientific domains, such as "Energy and Environment". It must be highlight that almost all regions identify Medicine, Health and Sustainability, variously declined, as a development priority. Labels as "Sustainable food production" or "Networks for the transition to circular economy" can be categorised under different areas of specialisation and macro areas, considering the potential transversal application of the related technologies.

In the same way, "ICT" can be categorised on the basis of its application in each of the above-mentioned areas of specialisation, in turn including several economic and scientific domains.

By way of example, ICT can be included in "Manufacturing" (e.g. "ICT and Automotive"), "Transport and Logistic" (e.g. "Smart Mobility"), "Energy and Environment" (e.g. "Green-tech") or "Medicine, Health and Sustainability" (e.g. "Health-tech", including e-health technologies). Only to regions, Śląskie Voivodeship and Dél-Alföld have indicated "ICT" as a specific domain.

In this report, we chose to attribute the macro area of specialisation "ICT" only to those regions that have specifically indicated within their specialisation domains the "ICT" as separated.[12]

Furthermore, the SSs selected by the region NUTS2 PL22 Śląskie Voivodeship clearly exemplify the above statement. The label "ICT" appears 5 times, differently declined:

- ICT - public health & well-being;

- ICT - micro/ Nano-electronics;

- ICT - advanced manufacturing systems;

- ICT - industrial biotechnology;

- ICT.

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[12] A similar approach has been applied in the Italian study published by Donato IACOBUCCI, Enrico GUZZINI, *The Smart Specialisation Strategy of Italians Regions and Links Among Technological Domains*, Italian Journal of Regional Science, vol. 15/n. 3, 2016, Franco Angeli, Roma.

A further food for thought arises from the analysis of the General-Purpose Technologies (GPTs)[13] and Key Enabling Technologies (KETs)[14], within the RIS3s under examination. Due to their nature, GPTs and KETs are transversal and cannot be recalled to punctual areas of specialisations. On the other hand, it is possible to analysis the positioning of each region from the point of view of their overall approach to such technologies as "core" (regions working at the "frontier" of these technologies) and "users" (regions that apply these technologies within the related domain of specialisations). Mostly of the regions can be categorised as "users" of these technologies and are not primarily focused of their development.

The proposed distinction, parallel to the above-mentioned observations concerning relatedness and connectivity, even appearing simplistic (considering limitations might play a significant role, namely those linked to making a complex process appear simple), suggests to reflect on the advantages that a more accurate evaluation of the vertical linkages and complementarity amidst SSs would make possible in terms of intra-regional and transregional cooperation on innovation and networking (e.g. facilitating the establishment of functional and effective consortium applying to EU, national and regional funds (where an international partnership is allowed), funds, such as Horizon 2020, COSME, CTE, …).[15] This would represent also a valuable contribute to the mapping activity of the R&D actors carried out at different level across Europe, enhancing European, national and regional policies coordination and the seamless adaption of the governance systems.[16]

Furthermore, focusing on KETs/GPTs allow us to introduce markets and global value chains into the proposed analysis. "*Intra-regional cooperation cannot be confined to upstream parts of innovation value chain, i.e., on R&D but should also include downstream activities or sectors in which R&D is applied. This is particularly relevant in the context of CE [Central Europe] which is the example of the EU macro-region that is most integrated through trade linkages*".[17] Our aim is to understand whether and how linkages between innovation upstream actors (e.g. universities, academies, R&D centres) and downstream actors (companies, business environments), influence the RIS3 designing process,[18] giving room for potential cooperation to strengthen the overall innovation capacity at Central Europe level (also properly taking into account the role of midstream actors, such as Competence Centres, clusters and Digital Innovation Hubs).[19]

We need to verify, starting from the RIS3 priorities selected the existence of a functional and effective linkage within the regional territories of potential technology intermediate users and end-users for the new

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[13] A General-Purpose Technology or GPT is a term coined to describe a new method of producing and inventing that is important enough to have a protracted aggregate impact (e.g. Electricity and Information Communication Technology). Boyan JOVANOVIC, Peter L. ROSSEAU, *General Purpose Technologies*, Handbook of economic growth, the New York University, New York, 2005.

[14] In this report, we apply the definition provided by the European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - "Preparing for our future: Developing a common strategy for key enabling technologies in the EU" {SEC(2009) 1257, http://bit.ly/2AXflby.

[15] On this specific issue, it is necessary to mention the existence of four EU Macro-regional strategies. The EU Macro-Regional Strategies (MRS) endorsed by the European Council emphasise greater co-ordination between different stakeholders and the alignment of resources and strategies in order to address common challenges in a defined geographical area. To date, macro-regions are: the EU Macro-Regional Strategy on the Baltic Sea Region – EUSBSR; the EU Macro-Regional Strategy on the Danube Region – EUSDR. The EU Macro-Regional Strategy on the Adriatic and Ionian Region – EUSAIR, and the EU Macro-Regional Strategy on the Alpine Region – EUSALP. These strategies all together concern 19 EU Member States and 6 non-EU countries. The EU Macro-Regional Strategies (MRS) serve as multi-level platforms bringing together in an organised way national, regional authorities, sectorial ministries and agencies, managing authorities of programmes, academia, research, entrepreneurs, local associations and other stakeholders such as civil society to tackle the common challenges. Bottom-up approach supported by the MRS is very important for the S3 strategies.

[16] A concrete example of such attempt is the study commissioned by the European Commission to the Technopolis Group, *A prospective comparative analysis of the national Smart Specialization Strategies in Central Europe*, 2016. Available at http://bit.ly/2zntp1T.

[17] *Ibidem*. p. 108.

18 An approximate overview per each region under examination of the upstream and midstream innovation actors is available on the KETs visualisation tool developed by the EU COMM DG Growth. Available at http://bit.ly/2zXtdWm.

[19] We must be aware that KETs have broad areas of application, which cannot be related to a single market or applicable only in tradable sectors but also in services (which are only partially tradable).

technologies driven in their development by smart specializations. This will allow RIS3 to effectively act as a pivotal innovation driver, ensuring functional linkages between upstream and downstream. In these terms, it is clear also how quality and the punctual implementation methodology of the already recalled "entrepreneurial discovery path" proposed by the European Commission heavily affect the resulting operationalisation of the territorial innovation strategy, along with its capability to positively impact. Concisely, we want to check the existence of a correspondence between sectors and related technological fields on which regions have prioritised their RDI resources (firstly ERDF and ESF funds), through their RIS3 related programmes and initiatives and the more relevant sectors in terms of trades and added value.

In this regard, at Central Europe level, it is possible to identify four main RIS3 funding models and the individual choice of the feasible combination depend on the nature of the SSs prioritised and the consensus reached after negotiation process with the triple helix (or quadruple helix) stakeholders. Most of the regions involved appear at the early-stage of their RIS3 operationalisation, therefore the primarily solution adopted is to fund projects and, more in general, initiatives fitting with the already existing financial instruments.[20] The table here below summarise the four funding model identified at Central Europe level.[21]

Funding Options	Descriptions	Degree of Complexity
EU investment instruments (ESI, COSME, Horizon 2020 and ESFRI).	Bringing together ESIF and Horizon 2020 in one project. Successive project or parallel projects. ESIF financing successful Horizon 2020 project applications not financed.	High
Project financed by national authorities by the national law, rules, regulations and procedures in effect.	EUREKA-funded projects.	The model currently in place
15% of ERDF, CF and EMFF priority axis may be spent in EU outside programme area (CPR art.70).	Opportunity for co-investment (transnational infrastructures and actions, such as cluster initiatives, shared Research structures, …).	High → model not yet in place
Co-Investment for joint demonstration opportunities (different sources of funding).	Commitment to the Vanguard Initiatives to the development of interregional networks, based on bottom-up entrepreneurship and regional clusters that co-invest in new interconnected European Global Value Chains.	High → model not yet in place

Trade date available at EU level[22] give us a good proxy for inter-regional/country flows of embodied technologies and knowledge. In detail, new EU member states (East Central Europe area), are quite strongly integrated into global value chains in terms of foreign value-added share of gross exports as about the 45% of the Central Europe gross exports contains foreign value-added components imported for the purpose of

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[20] The Vanguard Initiative established by the DG REGIO has played a fundamental role in experimenting feasible funding solutions for R&I policies implementation. Based on this "test", two key issues appear as *condition sine qua non* for the success of the RIS3: the amount of the budget allocation made available by PAs in order to match industrial expectation stimulating private E&I investments; The identification of effective solution for the IPR management. More information on the Vanguard Initiative are available at http://www.s3vanguardinitiative.eu/.

[21] Technopolis Group, *A prospective comparative …*, p. 120.

[22] E.g. sources EU COMM, OECD and WTO.

export.[23] *"S[3] offers an opportunity to in this respect to promote both upstream but also midstream and downstream cooperation in innovation value chains. The sectors, which are strongly integrated through value chains, should also offer opportunities for technology upgrading. These sectors should be as potential areas of technology applications developed though S[3] activities [potentially more relevant for territorial development compared to inward-oriented sectors"*.[24]

The inclusion and the positioning of each region under examination within Global Value Chains can produce both negative and positive impacts on regional economies and it is not a "win-win" element. On one side, being involved in Global Value Chains companies are engaged in international industrial networks and benefit from the opportunity to acquire new technologies from abroad, increasing overall quality and subsequent competitiveness of the overall regional economy. Companies and PAs (with RIS3 prioritarisation), are stimulated to upgrade their technological preparation.

On the other side, a large share of foreign value-added products in the gross export of a region indicate a dependence on foreign import, therefore, a dependence of import of foreign technology and knowledge.

Another possible way to compare economies is to take into account the related historical background and its evolution. Accordingly, it is possible to verify if there are significant differences in terms of SSs between East Central Europe regions/country (part of the EU since 2004, "Fifth Enlargement", i.e. regions/country belonging to Hungary, Slovenia Cech Republic and Poland) and West Central Europe regions. Here below a graphic overview of the results (dark grey: West Central Europe – 4 regions; light grey: East Central Europe – 5 regions/1 country):
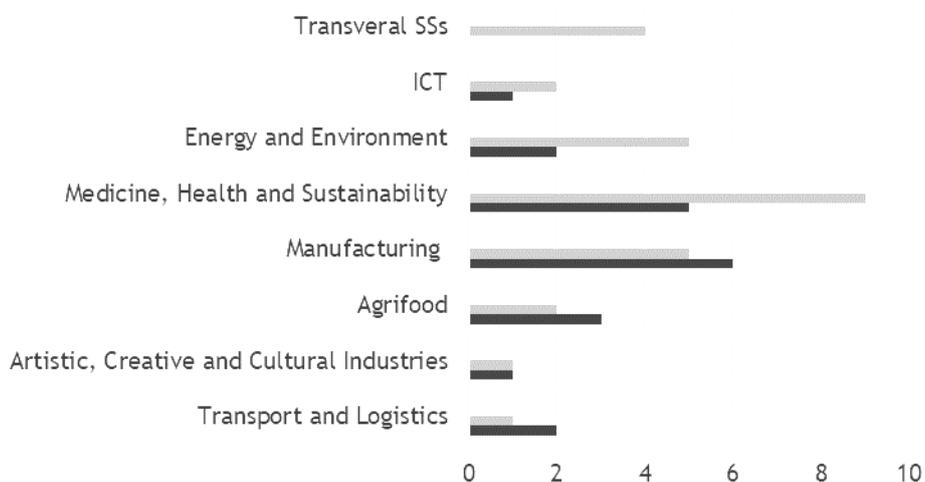
Both areas confirm the above-mentioned results in terms of preponderant specialisation domains. Anyway, they highlight a net prevalence of the East Central Europe regions/country in selecting SSs aggregated within

[23] WTO/OECED Trade in Value-Added database. Available at http://bit.ly/SaA19Y. The German-East Central Europe supply chain represents an example of this high integration, especially in the ICT and Electronic sector, including advanced manufacturing systems and new materials development.

[24] Technopolis Group, *A prospective comparative ...*, p.109.

the macro areas "Medicine, Health and Sustainability" (9-5), "Energy and Environment" (5-2). "ICT" (2-1) and, so categorised "Transversal SS" (4-0).

On the opposite side, West Central Europe regions show a predominance in "Manufacturing" (6-5), "Agrifood" (3-2) and "Transport and Logistics" (2-1). These results are partly due to the number of regions/country per group under examination, but suggest an undercurrent setting in approaching the SSs selection and resources' prioritisation. In general terms, East Central Europe regions/country show a widening radius of concentration in their RIS3, avoiding stressing excessively on concentration, compared to West Central Europe Regions in the sample under examination.

Particular attention has to be paid to the RIS3 of the NUTS2 CZ03 Jihozápad, which does not identify specific technology domains or economic domains on which specialise, but provides "areas of systemic intervention" to enhance the regional capability to develop and exploit innovation (i.e. get new products. technologies or services on the market). Accordingly, the domains of specialisation are transversal to the regional innovation system as a whole and cannot be categorised under a specific area of specialisation or macro area. The three SSs listed: "Human Resources support", "Business and Innovation Support" and "Support for R&D", targeting regional assets as the high-level education and training system (EQF 5 and above) as well as the capability of the major economic and R&D regional player to cooperate applying a triple-helix approach. This choice to foster the overall coordination of the "R&D system" can be related to the features of the economic sector, to the extent that the ownership of the major regional manufacturing companies, lands and natural resources is foreign. This hamper the possibility of the regional institution to directly influence the reginal economic development in the mid-long term and the capability to steer the main private actors of innovation.

Conclusions

In general, a first analysis of the RIS3s and SSs highlights a wide variety of approach in carrying out the "entrepreneurial discovery path"[25] proposed by the European Commission[26] and in identifying smart specialisations. Some regions focused specifically on technological/scientific domains, in line with the RIS3 methodology; some others have preferred to use economic/sectoral domains, more related to specific value chains particularly relevant at regional or transregional level (e.g. aerospace, automotive).

A further approach applied have focused on the Innovative Ecosystem itself at regional level, transversally to technological/scientific and economic/sectoral domains.

We refer here to SS System Science, Human Resources support, Networks for the transition to circular economy, Inclusive and Sustainable Society, Support for R&D. These choices are linked to the punctual regional economic and innovation environment, as reported for the NUT2 Region CZ03 Jihozápad.

A specific point is needed in relation to ICT and related services, which is largely categorised based on its application within other SSs due to its transversal and pervasive nature.

The analysis of the SSs highlights shared elements of potential weakness probably linked to:

- The novelty of the mapping process itself (in terms of relationship and networking among different technological development actors and networks, as well as among the technological fields and business environment, including services and, in particular, KIBs);

- To the lack of a common and univocal methodology applied at EU level (The same European Commission provided only detailed procedural Guidelines and minimum criteria for each RIS3 Governance System, including interim/final assessment, evaluation on seamless monitoring).

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[25] On this point, see: http://s3platform.jrc.ec.europa.eu/entrepreneurial-discovery-edp.

[26] European Commission, *guide to Research* …, see intra footnote n. X.

A third element that can hamper the fully operationalisation and decreasing the overall impact of RIS3 policies is the repeatedly mentioned extent of the SSs selected that makes it necessary to propose an aggregation before analysing, in order to bring each SS in a common framework (although simplistic), allowing repetitions and overlapping of single specialisations in order to cover all the related subdomains identified by regions.[27]

This is also the results of a lack of a common classification system and a common reference language at EU level provided by the European Commission. By way of example, it is necessarily complex to clearly establish the exact limits and boundaries in terms of technological contents, value chains and markets for specialisation domains such as "Health", "Energy", "ICT" and Smart Manufacturing/Production".

In this regard, we can take as sample, the four groups of specialisation domains categorised with the same "label" by different regions, trying to identify overlapping, similarities and differences in the description, the economic and technical/scientific domains. This approach helps us to better focus and understand the way each region has selected and designed its RIS3, according to specificities of the local context, value chains and regional, national and EU/International networks in which it is involved.

Here below Table N. X reports the results of the specialisation "Mobility", in terms of economic domain, technological/scientific domain and policy objectives targeted by the region NUTS2 AT02 Steiermark and NUTS2 DE8 Mecklenburg Vorpommern.

	Description	Economic domain	Technological/Scientific domain	Policy obj.
AT	Mobility	H Transportation and storage H.49 Land transport and transport via pipelines H.50 Water transport H.51 Air transport H.52 Warehousing and support activities for transportation H.53 Postal and courier activities	04 Transport, telecommunication and other infrastructures 04.23 Civil engineering 04.24 Construction and planning of building 04.25 General planning of land-use 04.26 Protection against harmful effects in town and country planning 04.27 Telecommunication systems 04.28 Transport systems 04.29 Water supply	J Sustainable innovation J.66 Smart green & integrated transport systems
DE	Inter-modal mobility models, development and production of automotive and automative systems, lightweight construction, e-Mobility, process and resource efficiency	C Manufacturing C.29 Motor vehicles, trailers and semi-trailers C.30 Other transport equipment H Transportation and storage H.49 Land transport and transport via pipelines H.52 Warehousing and support activities for transportation	04 Transport, telecommunication and other infrastructures 04.28 Transport systems 06 Industrial production and technology 06.38 Increasing economic efficiency and competitiveness 06.39 Improving industrial production and technology 06.60 Manufacture of motor vehicles, trailers and semi-trailers 06.61 Manufacture of other transport equipment	D Digital transformation D.30 Intelligent inter-modal & sustainable urban areas (e.g. smart cities) J Sustainable innovation J.65 Resource efficiency J.66 Smart green & integrated transport system

[27] On this point, see also Fatime B. HEGYI, Ruslan RAKHMATULLIN, *Implementing smart specialisation - thematic platform on industrial modernisation*, JRC Technical Report, S3 Policy Brief Series N. 2/2017, Publications Office of the European Union, Luxembourg, 2017.

		12 General advancement of knowledge 12.102 Engineering Sciences 12.104 Mathematics, computer and information sciences	

The Table above clearly showed how under a same label "Mobility" each region has grouped a wide range of economic, as well as technological/scientific aspects[28], so as not to be perfectly superimposable and univocally identifiable. Similar results are obtained comparing the three remaining groups previously mentioned.

F. SECTION D Business Institutional Environment – The Supply: : mapping results

For this section is was critical to identify and better inform the partnership on the specificity of supply schemes made available with the existing system of BSOs. The setting of the supply is highly linked to the economic situation and to the similarities appear within some of the clusters of regions.

Slaskie: BSOs' service set upon the variety of supply schemes with selected groups of BSOs' offering monitoring functions (ROs)

Lubelskie: BSOs' service mainly set upon training, information and assistance; further offers apply

Northern Great Plain: BSOs' service mainly set upon counselling, networking and training; further offers apply

South Great Plain: BSOs' service mainly set upon consultancy and knowledge provision; further offers apply

Mecklenburg-Vorpommern: subsidies, craft support, tech support and infrastructure; variety of BSOs highly specialised in specific support

Veneto: a set of BSOs with a complex services' offer mainly linked to business assistance and education

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[28] To allow for easy comparisons with established classifications, priorities are classified using the Statistical Classification of Economic Activities in the European Community (NACE rev. 2) and the Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets (NABS 2007). Data are elaborated from the Eye@RIS3 repository developed by JRC. Eye@RIS3 visualises public investment priorities for innovation across Europe. It enables public managers and stakeholders to position their territory in comparison to other territories and to find potential partners for collaboration. Inside the EU, priorities are linked to the use of the European Regional and Development Funds (ERDF). Data are based on the information found in Smart Specialisation Strategies and related strategic frameworks. Available at http://bit.ly/2AZGlqW.

Piedmont: innovation hubs with sectoral/geographical basis; high variety of soft and hard infrastructure services

Eastern Slovenia: ministries, private and public organisations play the role of BSOs (linked to acquiring the funding); new schemes: Strategic Research and Innovation Partnerships (more complex in service delivery)

Styria: BSOs' targeting business promotion and start-ups; further offers availble with incubators, accelerators, technology and business parks

Jihozapad: variety of BSOs targeting any support

This section might be useful to bridge some gaps in the level and variety of supply-side specificity. Prior to eventual selection of best-practices in setting the high level of support to business, one must identify the level of economic growth (as shown in section A, for example). The institutional support patterns identified in section B should also be taken into consideration as most of the regions described a rather limited evolutionary patterns of institutional changes.

The detailed reports of the consortium partners should be used for final reference in defining the benchmark against the supply-side offers.

G. SECTION E Business Institutional Environment – The Monitoring: mapping results

Section E. BUSINESS INSTITUTIONAL ENVIRONMENT – THE MONITORING

In this Section, we will primarily observe the overall situation of the RIS3 monitoring activity in each region, i.e. if and how the governance and monitoring system has been already formalised (and to which extent), or not.

A synoptic framework will be used in order to easily compare monitoring arrangements adopted on the basis of relevant variables, such as:
- *nature (internal/external – public/private) of the monitoring bodies appointed;*
- *n. of bodies appointed;*
- *periodicity;*
- *tools applied to monitoring;*
- *ways to evaluate and apply corrective/improvement measures on the basis of monitoring evidences;*
- *similarities and divergences in terms of weakness points and items/parts of the process that necessitate to be further revised/improved.*

The main objectives of this Section are:
- to provide an immediate and clear overview of the state of play of each territory under examination concerning the monitoring system (actors, process, activities) of the RIS3s operationalisation;
- to assess each monitoring system based on a set of variables.

Within the table here below, we propose to the reader an interpretation each regional monitoring system already put in place or still under definition and establishment though 3 variables:

- Institutional organisation and operative model designed;
- Methodology and monitoring evaluation system/process selected;
- Availability of knowledge and technology information platform for SSs chosen.

The data collected and their elaboration hereafter proposed have to be considered as a proxy and still subject to review and editing in the future due to the evolutive nature of the RIS3 operationalisation process at the present.

MONITORING SYSTEMS ANALYSIS

VARIABLE	ASSESSMENT RANGE		
	Being Finalised	**Rather Defined**	**Defined**
ORGANISATION	Észak-Alföld (Still under definition)	Veneto Region (Public-Private collaboration under systematisation)	Śląskie Voivodeship (3 SSs → 3 ROs dedicated)
	Dél-Alföld (Still under definition)		Piedmont Region 1 ROs (NUVAL)
	Jihozápad Plzn Region (RRA-PK) Budweis (South-bohemian Technology Park)		Lubelskie Voivodeship (Centralised syst. Marshall O.)
			Steiermark (Centralised SFG)
			Vzhodna Slovenija (National centralised NIP-Horizontal/Strategical)
			Mecklenburg-Vorpommern (Federate State centralised system)
	Informal	**Mixed System**	**Formally Established**
MONITORING & EV. METHODOLOGY	Észak-Alföld (Still under definition at regional – defined at national)	Lubelskie Voivodeship (being finalised)	Piedmont Region (Ev. Unit+Monitoring Unit, Ext/Int)
	Dél-Alföld	Veneto Region (Public-Private collaboration system for policies procedures & tech.	Steiermark (Centralised EPIS)

	Not Available	Being Finalised	Fully Available
	Észak-Alföld (Under construction)	Lubelskie Voivodeship (being finalised-transport info.)	Piedmont Region (Inn.Hubs+Tech. Platforms)
SSs KNOWLEDGE PLATFORM AVAILIBILITY	Dél-Alföld (Under construction)	Veneto Region Under construction (almost ready)	Steiermark (Centralised WIBIS)
	Jihozápad (under construction)		Śląskie Voivodeship
	Vzhodna Slovenija (under construction)		Mecklenburg-Vorpommern Regional S3 dedicated website

Above the table, additional cells:

(Still under definition at regional – defined at national)	Vzhodna Slovenija (institutionally defined (WHO), Process still under definition (HOW))	Śląskie Voivodeship
Jihozápad (predominantly informal)		Mecklenburg-Vorpommern (State system of result and impact indicator)

H. FURTHER STEPS

As pinpointed in the project application form, the tools and guidelines for analysis of the RIS state of art in consortium regions need to build upon the set of specific activities aiming at identification of competence map (what is offered as a supply of services provided by BSOs and specifically by ROs), made available to raise the awareness of the stakeholders and to support the level and quality of services used by end-users. The benchmark tool that is due in the project lifetime should allow to better match the specificity of conditions set by the economy, smart specialisation processes and other important regional contexts. Finally, the demand layer (WPT2) will bring the verification to what extent the services are meeting the needs of end-users and what patterns of upbringing the value should apply.

I. ANNEXES

The documents provided by partners of the project consortium can be downloaded at:

https://1drv.ms/w/s!Aj1Ca2__V8LdgS474DAlqRfdJtbf

https://1drv.ms/w/s!Aj1Ca2__V8LdgTCcqKJYeSloEias

https://1drv.ms/w/s!Aj1Ca2__V8Ldgjuwf_JgLqMhx8rP

https://1drv.ms/b/s!Aj1Ca2__V8Ldgj_Al_FpebZuh9w_

https://1drv.ms/w/s!Aj1Ca2__V8LdgTNcq5MAztP2kPVn

https://1drv.ms/w/s!Aj1Ca2__V8LdgTXkawl_5iMZlLdZ

https://1drv.ms/b/s!Aj1Ca2__V8LdhBvPPE9rZRS-LA9u

https://1drv.ms/b/s!Aj1Ca2__V8LdhBw1Av8NJHKbvAY8

https://1drv.ms/w/s!Aj1Ca2__V8LdgTaB8-s2NYZONv0Z

https://1drv.ms/b/s!Aj1Ca2__V8LdhDYdR9OrPOvFCweM

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