THINKING SMART

Toolkit for the engagement of HEI in regional growth

04.1 – Action plan for the alignment of HEIs with regional smart specialisation

SPI

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1. Introduction

1. Introduction

This document – O4.1 Action Plan for the alignment of HEIs with regional smart specialisation - was developed as part of WP4 - Strategic Changes in HEIs to align with regional Smart Specialisation.

This WP will aim to provide objective action plans for each one of the five HEI partners to support them in adjusting their strategies and offer (with a special focus on the educational offer and teaching/ learning processes, but as well with regard to research and development (R&D), services, etc.) according to the smart specialisation regional/ local needs and priorities. To do so, HEI's strategies will be reviewed based on the results of the entrepreneurial discovery process undertaken in WP3.

The main objective of this document is to provide 5 action plans for each one of the universities participating in the project: Universidade de Trás-os-Montes e Alto Douro (UTAD), Universidade Politecnica de Valencia (UPV), Politecnico di Milano (POLIMI), Newcastle University (NCL) and Uniwersytet Łódzki (ULO).

Each one of the universities has conducted preliminary work divided in 3 stages:

- Stage 1 – Creation of collaborative working groups with stakeholders and mind setting workshops
- Stage 2 – Mapping and critical analysis of HEIs capabilities and offer
- Stage 3– Matching between regional/local needs and priorities and HEIs capabilities and suggestions

These action plans are based on the results of the preliminary work and will focus on:

- Assessing the HEIs' offer (in terms of teaching and learning, R&D, services, etc.) to see if it matchs the regional smart specialization strategies;
- Reinforcing cooperation with regional authorities with regard to regional growth;
- Providing capacity building inside the organisations towards regional priorities and specialisation areas;

- Identifying mechanisms to combine research excellence with regional needs and opportunities.

A final note to mention that these actions plans are an overview of what has been done by the universities during the Thinking Smart project and include some recommendations taking into account that work. These are not meant to be exhaustive. In addition, it is important to refer that the work on this topic is always subject to change, so it might be that the actions included in the document are not updated after the end of the project.

2. Action plan: Universidade de Trás-os-Montes e Alto Douro

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2.1 Context

Universidade de Trás-os-Montes e Alto Douro (UTAD) is an institution oriented towards the creation and dissemination of culture, knowledge and science by merging teaching, scientific research and experimental development. Within the current framework of innovation, the Schools and Research Centres develop scientific activity that seeks to deepen knowledge and develop technology capable of addressing issues of global, national or regional scope. UTAD's core objectives are high quality Teaching, Research and Community Outreach, striving to be a Centre of Excellence for lifelong learning and for the creation, transmission and dissemination of culture, science and technology. UTAD has an International Relations and Mobility Unit (GRIM) that supports students, teachers and staff to go abroad under different mobility programmes and cooperation agreements. The Project Unit (GAP) deals with activities aimed at knowledge transfer, the connection with the business sector and to support companies in the technological area.

UTAD is a member of the recently created "Northern Portugal University Consortium", in which three major universities (Minho, Porto and UTAD), together with the regional authorities, will elaborate an integrated investment plan for regional development. UTAD also participates in the Iacobus programme (funded by the European Union) which integrates the Galician universities of Vigo, Santiago and Coruña, the Portuguese Catholic University of Porto (UCP), University of Minho (UMinho) as well as with the polytechnic institutes of Porto, Viana do Castelo, Bragança, Cávado and Ave.

UTAD also participates in the joint project (with the municipality of Vila Real and the Portus park network of Science and Technology Parks) of the Regia-Douro Science and Technology Park. This Park focuses on the research and development of wine, vineyard, agricultural, food and environmental technologies. It is constituted by the:

- The Center of Technology and Innovation focusing in applied research and development on Wine and Vineyard (*Centro de Excelência da Vinha e do Vinho* – Center of Excellence of Wine and Vineyard).

- The Douro Business Center providing optimum logistic facilities and networking opportunities for doing business and investing in the Douro region.

- The Douro-NEST incubator and accelerator for tech start-ups, with facilities for young business projects, providing support in business incubation, business acceleration, networking, strategy and internationalisation.

Regarding the smart specialisation and regional development, "Norte 2020" is the financial instrument supporting the regional development of the North of Portugal, managed by Northern Portugal Regional Coordination and Development Commission (CCDR-N). The work carried out during the preparation of the smart specialisation strategy (RIS3) had significant involvement of relevant stakeholders and experts through the organisation of surveys, thematic workshops and individual meetings. After an analysis of the regional context and potential for innovation, and the establishment of an overall vision for North's future, the following priority areas have been selected for the entire northern region:

- ✓ Life and health sciences
- ✓ Culture, design and fashion
- ✓ Sea-related economic activities
- ✓ Human capital and specialised services
- ✓ Mobility and environment industries
- ✓ Advanced manufacturing
- ✓ Agriculture environmental systems and food
- ✓ Symbolic capital, technology and tourism services

UTAD has played an important role in constructing the relationship with the CCDR-N for the mutual identification of the smart specialisation themes for the RIS3 in the Douro region.

2.2 Gaps, barriers and challenges

The entrepreneurial discovery process done by the UTAD team identified some gaps and challenges of the institutions and its members.

UTAD has a significant portfolio of research projects and strategic partnerships established with the companies in the region with a focus on the agrifood, forestry and tourism sectors as shown in the table below:

Project	Coordinator/partnership	Area
NanoStima	INESC Porto	Sports
Deus Ex Machina	Fraunhofer	Sports
INTERACT-BEST	UTAD/CETRAD	Agro-Chains and Technology
Dourotur	UTAD/CETRAD	Tourism and Development
Plataforma da Inovação da Vinho e do Vinho – Collaborative Lab	UTAD	Wine and Vineyard
Animal Farming – Collaborative Lab	U.Porto and UTAD	Animal Sciences
Smart Farming	UTAD	Farming
UNIRCELL - CQVR	UTAD/PAC	Science
SMARTagrifor	Europeus/UTAD	Agri-forestry
U-BIKE	POSSEUR	transport
REAV2 (Network)	UTAD	Wine and Vineyard
NorteInova	U.Porto, UMinho, UTAD	Technology transfer
Lab2Business	UCP, UTAD	Technology transfer

Table 1 – UTAD projects

Within the framework of CETRAD, UTAD also participates in two projects in the areas of agrobusiness and sustainability and territorial development. On the topic of the local

authorities, there is a strong connection between the university and the municipalities – UTAD has already signed a protocol with 32 municipalities of the region. The Regia-Douro Science and Technology Park has been developing a set of action, namely workshops, in the areas of Tourism, Gastronomy and Wine that attract businesses to the institution.

Despite the synergies with other regions and the enhancement of the collaboration opportunities and participation in networks (as described above), there is still a lack of qualified critical mass and skilled workers. UTAD still needs to work in developing additional cooperation opportunities (through the participation in capacity building programmes and bilateral agreements) to enhance the development of skills and capacity building of its staff and researchers. This would also enhance its participation in international projects which is still in an early stage.

The connection between UTAD and the civil society stakeholders is an aspect that also needs to be improved. There is a weak support for social measures that foster transfer of knowledge and promote integration and social cohesion. This interaction should be improved with more initiatives involving all the stakeholders. Some of the interviewed members from UTAD suggested that this interaction could be improved with the development of an online platform or adaptation of the existing website with information on initiatives and project results, available to all interested stakeholders.

2.3 Concrete actions

The gaps and challenges identified focus on three main areas:

- Training:
  - Better alignment of the academic, staff and research offer at UTAD with RIS3 topics.
  - Increase participation in capacity building programmes.
- Connection with society:
  - Improvement of cooperation mechanisms with civil society, for example, the update of existing platforms such as the Thinking Smart good practices database and toolkit, easily accessible to all interested stakeholders, with information on the projects to be developed and its results.

- Creation of better communication mechanisms between university, businesses/associations and civil society organizations.

- Research and development (R&D):
  - Increase participation in research and development programmes.
  - Better alignment of the research centers at UTAD.

Taking into account these gaps and challenges, SPI defined 4 actions:

1. Invest in training for the technical staff.
2. Invest in more cooperation and exchange programmes.
3. Improve cooperation mechanisms between UTAD and the civil society.
4. Reinforce support structures for R&D.

Action 1.
Invest in training for the technical staff
OBJECTIVE: Develop UTAD's educational and training offer initiatives for its technical staff that is ill-equipped to understand the RIS3 and how UTAD can expand its services in societal engagement, cooperation, participation in EU-funded programmes, and research and development.
ACTIVITIES TO DEVELOP: : Organize a meeting with the different departments to understand the main needs of the technical staff. : Restructure the existing training offer to address those needs. : Provide the means for the technical staff to attend those short courses.

Action 2.

Invest in more cooperation and exchange programmes

OBJECTIVE:

Expand and improve the two units that support these activities: GAP (Projects Unit) and GRIM (International Relations and Mobility Unit). There is already a strong involvement in Erasmus + and H2020 programmes, as well as other cross-border exchange programmes with universities from the North of Portugal and Galicia. Nevertheless, these actions should be further increased.

ACTIVITIES TO DEVELOP:

- Establishment of additional protocols with international institutions focused on similar thematic areas for the mobility of students, researchers and staff.
- Development of applications for national (Norte 2020) and international (Marie-Curie and H2020) programmes with the objective to support doctorate and post-doctorate researchers.

Action 3.

Improve cooperation mechanisms between UTAD and the civil society

OBJECTIVE:

Develop stronger links with the civil society, i.e, better communicate the initiatives that are taking place.

ACTIVITIES TO DEVELOP:

- Involve civil society organizations in the different project's dissemination activities.
- Use of the Thinking Smart platforms (best practices database and toolkit) that will be available in English and Portuguese to disseminate information on the projects

and its results to all interested stakeholders. These platforms can be updated and linked to existing platforms at UTAD, for example, the Wine Innovation Platform hosted by Regia-Douro Parque.

- Create mailing lists to disseminate information.

Action 4.

Reinforce support structures for R&D

OBJECTIVE:

Increase cooperation between its different units as a way of reinforcing R&D activities and strengthen the funding from partnership projects. This will also benefit the strengthening of cooperation with external entities (see Action 2.)

ACTIVITIES TO DEVELOP:

- Creation of a working group (with one representative from each department and the GRIM and the GAP units) that will host regular meetings to define lines of actions and next steps. These meetings could also be attended by external entities (if considered relevant).
- Development of a joint activity plan by the working group. This plan will define actions, responsibilities and indicators functioning as an action plan and monitoring guide. Examples of actions could be the update of the platform (see action 3) with the existing projects and organization of a joint UTAD research day.

3. Action plan: Universidad Politecnica de Valencia

3. Action plan: Universidad Politecnica de Valencia

3.1 Context

The Universitat Politècnica de València (UPV) was founded in the early 70s and is now composed of 10 schools, 3 faculties, 2 higher polytechnic schools and associated schools (Ford Spain Technical School of Industrial Engineering, Faculty of Business Studies, La Florida University School, and Pax University College). The 10 schools and faculties are spread in three campus: Vera, Alcoy, and Gandia. The Vera Campus has the majority of faculties including the Faculty of Business Administration and Management, the Faculty of Fine Arts, the School of Agricultural Engineering and Environment, the School of Architecture, the School of Building Engineering, the School of Civil Engineering, the School of Design Engineering, the School of Engineering in Geodesy, Cartography and Surveying, the School of Industrial Engineering, the School of Informatics, the School of Telecommunications Engineering and the Doctoral School. UPV has almost 38000 students, 2.600 members of the teaching and research staff and 1.700 administrative and services personnel.

As described in its website, UPV's mission is to:

- offer quality structured training geared towards the necessities of society;
- develop research which is relevant and has an impact;
- transfer its results both nationally and internationally;
- be considered as a strategic partner for universities and institutions at a global level;
- stand out in its commitment to social responsibility as a public university.

The Valentian Institut of Entrepreneurial Competitiveness (IVACE) is the agency responsible for RIS3 in the Valencian Region. IVACE has as its objectives to establish, manage and support companies from Valencia that wish to modernize and internationalize and also supports the creation of new companies. It also promotes, manages and coordinates the industrial infrastructures, the research, development and innovation institutions, scientific and technological parks.

The Valencian RIS3 was developed taking into account an analysis of the regional context and the established strategic framework. There was a focus on seven workgroups: agri-food, consumption (but not habitat), key enabling technologies (KET), information and communication technologies (ICTs), low carbon economy (LBC), logistics and transport.

From those, the RIS3 was delimited in three axes:

- Axis 1: Quality of life
    - Agricultural, cosmetics and household products
    - Health promotion and efficient public healthcare
    - Tourism and quality of life

- Axis 2: Innovative product
    - 2.1. Customized consumer goods
    - 2.2. Habitat: the housing and its environment

- Axis 3. Advanced manufacturing processes
    - Automation and mobility
    - Equipment goods

As presented in greater detail in WP3 by UPV, these major regional economic axes have been analysed from the perspective of possible areas of technological or transversal specialization. These areas of expertise have been rearranged in the following areas:

- Advanced materials and nanotechnology
- Advanced manufacturing
- ICT (Information and Communication Technologies)
- Biotechnology
- Micro and nano-electronics, and photonics
- Energy and environmental technologies
- Logistics

3.2 Gaps, barriers and challenges

UPV has a very strong participation in European research and innovation (R&I) projects, participating in over 70 H2020 projects. Therefore, there are systematic solicitations to its community to participate in project's activities. Due to this fact, it would be more difficult to recruit stakeholders for Thinking Smart activities.

In order to solve this challenge, UPV took a different approach by adopting a format of workshops and mind-setting groups that encouraged the debate to the questions raised.
These participants pointed out several aspects that have been improving as well as gaps and barriers to the successful RIS3 implementation:

- The connection between the universities and the industries has improved significantly, however, there is still a lack of more effective trust and communication mechanisms. In fact, there must be an optimization of this connection, for example, through the improvement of the communication mechanisms such as the one done in the Ask UPV initiative.
- There is an understanding by some researchers that the university can't do much more on RIS3 than what was already done as the academic culture is not able to address all the multidisciplinary and thematic priorities. Research (through the publication of academic papers is of the utmost importance) and it takes longer for academics to adapt to these changes – this can be changed with more policies and incentives towards this aspect, for example, the development of more patents and not only ranking and accreditations.
- Universities do not have a lot of experience with EU Structural Funds.
- The Community of Valencia has now higher productivity levels, despite being strongly affected by the financial and economic crisis of 2008. However, the industry has still little specialization in high technologic products and is highly sensitive to the economic cycle, highly dependence on tourism. Valencia has also a shortage of large companies. There is a low spending on R&I and insufficient businesses have employers with scientific training and knowledge on EU R&I opportunities.

3.3 Concrete actions

The gaps and challenges identified focused mainly on the universities – how they can do more on RIS3 – and on the industry – how to increase its spending and investment on R&I. In addition, it is also important to invest more in an optimized connection between universities and industries.

Below it is detailed 4 actions to tackle these issues:

1. Invest in a closer cooperation between universities and industries through exchange stays.
2. Improve communication mechanisms between UPV and industry.
3. Provide training both for companies and university staff.
4. Reinforce support structures for the development of patents.

Action 1.
Invest in a closer cooperation between universities and industries through exchange stays.
OBJECTIVE: The short stays of university teachers and/or researchers in companies would be very useful to develop joint research aligned with the companies' needs and the research interests. In this way, the universities would be more involved in practical applications of their research and the companies see the benefits in investing in more R&D training
ACTIVITIES TO DEVELOP: : Creation of a recruitment and selection committee : Development of a pool of companies and researchers interested in participating in the initiative based on a set of criteria, including interests and availability : Definition of the working programme, objectives, and duration of the stay between the selected researcher/teacher and the company

- Definition of the outputs to be achieved during and after the stay

Action 2.

Improve communication mechanisms between UPV and industry

OBJECTIVE:

The universities and the industry are cooperating, but the communication mechanisms are still weak. To improve this, there is a need to create more initiatives that allow them to work more closely.

ACTIVITIES TO DEVELOP:

- Organisation of "science meets business" annual events where researchers can present their work and activities and companies can explore ways of integrating R&I in their work
- Creation or improvement of communication channels such as Ask UPV with online platforms to ask specific requests

Action 3.

Provide training both for companies and university staff

OBJECTIVE:

The staff of the companies in the region have little scientific training and are not so much aware of R&I opportunities. Staff from universities have little knowledge on EU Structural Funds. These two aspects can be tackled with the provision of training for both.

ACTIVITIES TO DEVELOP:

- Develop short training sessions (online and face-to-face) for the companies that can be included in their training programme on how R&I management

- Promote training sessions for the staff at universities on how to better understand EU Structural Funds
- Develop short fact sheets/guides with information on the Funds

4. Action plan: Politecnico di Milano

4. Action plan: Politecnico di Milano

4.1 Context

The Politecnico di Milano (POLIMI) is a scientific and technological university aimed to train engineers, architects, planners and industrial designers. It has seven campus – Milano (Leonardo and Bovisa campuses), Como, Lecco, Cremona, Mantova and Piacenza – with over 1200 technical administrative staff, 1364 teaching staff and almost 43000 students.

POLIMI has 12 departments:

- Aerospace Science and Technology
- Architecture and Urban Studies
- Architecture, Built Environment and Construction Engineering
- Chemistry, Materials and Chemical Engineering
- Civil and Environmental Engineering
- Design
- Electronics, Information and Bioengineering
- Energy
- Management, Economics and Industrial Engineering
- Mathematics
- Mechanical Engineering
- Physics

It also has other research infrastructures such as the WindTunnel, PoliFab, Polifactory, and Materials Testing Laboratories, more than 250 labs, and a Joint Research Centre. POLIMI also participates in the clusters of Design of health facilities, Innovative Textiles and Security, Safety, Defense and Disaster Management.

POLIMI has a vast experience in EU funded research projects: 272 projects + 9 ERC Grants (FP7) and 208 H2020 projects. Data from 2016 show that 48 companies were established and accredited since 2000 and that 1396 patents were filed.

POLIMI and the city and regional institutions, namely the Regional Council of Lombardy that is responsible for the RIS3 - made a joint effort to create an institution – Fondazione Politecnico – to strengthen the alliance between university and the industry. Fondazione was launched in 2003 with the mission to "build a more effective relationship between university, industry and public administrations". Fondazione develops innovation and European projects for large companies and SMEs. It also develops training programmes for professionals.

POLIMI is part of the Lombardy region which was one of the first to launch its smart specialization strategy in 2013. The development of the strategy was done by several actors, in which POLIMI and other regional Higher Education Institutions were included. The economic complex profile of the region, which is highly specialized and differentiated led to the definition of eight priority, as follows:

- Aerospace
- Agri-food
- Green industry
- Creative and cultural industries
- Health industries
- Advanced manufacturing
- Sustainable mobility
- Smart Cities (cross cutting priority)

These priorities are combined with the areas of the Regional Technological Clusters[1] (Aerospace, Agri-food, Green chemistry, Energy, Life sciences, Technologies for living environments, Smart factory, Mobility, and Technologies for Smart Communities) as a way to enhance the development of a multi-sectorial system.

[1] "The Region aims at supporting a process of identification of new emerging manufacturing systems, at the same at promoting new capacity of collaboration between the regional actors. Technological clusters (TC) are identified in this sense as both a space for supporting entrepreneurs developing new cross-sectorial fields of innovations and new governance spaces - to connect regional authorities and regional systems"

4.2 Gaps, barriers and challenges

As mentioned in the previous section, the Lombardy region is different from the other regions partner of the Thinking Smart project as it is highly specialized and differentiated. POLIMI has played a very important role in the definition of the Lombardy RIS3 (see 3.1), which due to its complexity also involved several different departments spanning many of the RIS3 priorities.

In fact, the connection between POLIMI and the regional institutions in Lombardy is good, but done mainly through the different departments rather than centrally. This is not a concern for the departments, as it is seen as a more effective way of cooperating. Nevertheless, it should be ensured that more cooperation mechanisms are defined for the departments.

Despite the importance of POLIMI as an actor in the development of the Lombardy smart specialization strategy, the participants are concerned that higher education institutions in general should be more involved as practical actors in the actual implementation of the RIS3, namely in the implementation of R&D results in the industry, and not solely as providers of theoretical inputs.

There is also a concern that in the last phase of the policy implementation of RIS3 the interaction between the different actors – namely HEIs and Regional Technological Clusters – is not monitored effectively and, therefore, it does not have a measurable impact.

POLIMI has been enhancing the establishment of collaboration with industry, not only through the work of the Fondazione, but also through the networks established (for example, with several consortia in the different fields). POLIMI is also a major actor in the development of and participation in EU funded initiatives (see 2.1), nevertheless, there is a feeling among the departments that results and activities are not being efficiently disseminated, thus possibly reducing its impact on several levels.

Some of the most active departments of POLIMI expressed a sense of conformity towards these issues which may, in some way, hinder the adaptation to the challenges and the development of the actions to solve them.

4.3 Concrete actions

Taking into account the information collected by POLIMI in their WP3 activities, the following actions are proposed:

1. Invest more in the communication and cooperation between departments and regional authorities
2. Monitor the actual impact and implementation of the RIS3
3. Disseminate and advertise the ongoing initiatives (and success stories)

Action 1.
Invest more in the communication and cooperation between departments and regional authorities
OBJECTIVE:
The different departments at POLIMI have a good degree of communication and interaction with the regional authorities and other actors of the RIS3 in Lombardia. To leverage these connections, more investment should be made on this.
ACTIVITIES TO DEVELOP:
: Create a task force between departments to define strategies for a closer interaction (see action point 2 and 3)

Action 2.
Monitor the actual impact and implementation of the RIS3
OBJECTIVE:
This monitoring can be done at the POLIMI departmental level by the Heads of Department, but with an involvement of the central level. If a close monitoring with specific key performance indicators are established by the departments, it will be easier to actually measure the impact of the implementation of the RIS3.

ACTIVITIES TO DEVELOP:

- Promote department meetings to define the monitoring strategy, namely the objectives and the key performance indicators to be achieved
- Promote inter-departmental meetings to share and discuss the monitoring strategy
- Combine the monitoring strategy with the results of action 3

Action 3.

Disseminate and advertise the ongoing initiatives (and success stories)

OBJECTIVE:

POLIMI has a vast track record of participation in EU funded programmes (FP7 and H2020). It also has a strong connection with companies in the Lombardy region. However, the dissemination and advertising of the ongoing initiatives (as well as success and failure stories) are not so effective.

ACTIVITIES TO DEVELOP:

- Create a specific section on the POLIMI website to disseminate these results and initiatives
- Include these news in the newsletters, social media and other promotional materials to be disseminated

5. Action plan: Newcastle University

5. Action plan: Newcastle University

5.1 Context

Newcastle University (NCL) is a research intensive university in the North East of England whose roots can be traced back to 1834 with the establishment of the School of Medicine and Surgery. Newcastle's main teaching and research activities take place at the Newcastle city centre campus. NCL has three further campuses in Singapore, Malaysia and London.

Newcastle University is organised around three faculties - the Faculty of Humanities and Social Sciences, the Faculty of Medical Sciences and the Faculty of Science, Agriculture and Engineering.

It has as main objectives to:

- be a world-class research-intensive University
- deliver teaching and facilitate learning of the highest quality
- play a leading role in the economic, social and cultural development of the North East of England

The North East Local Enterprise Partnership (North East LEP) is a public, private and education sector partnership. It is one of the 38 LEPs in the United Kingdom and is responsible for promoting and developing economic growth in the local authority areas of County Durham, Gateshead, Newcastle, North Tyneside, Northumberland, South Tyneside and Sunderland, focusing specifically on:

- Innovation
- Business growth and access to finance
- Skills
- Employability and inclusion
- Economic assets and infrastructure
- Transport and connectivity

The LEPs have a central role in delivering the RIS3 by identifying opportunities at the local level that could be aligned with national research/innovation and industrial priorities. The NELEP embraced this role within smart specialisation. NELEP commissioned a smart specialisation report (prepared in-part by members of Newcastle University) that was published in December 2013. The analysis in the report focused on four areas of economic activity in which the North East had existing strengths or strong potential for growth:

- Passenger Vehicle Manufacturing;
- Subsea and Offshore Technology;
- Life Sciences and Healthcare; and
- Creative, Digital, Software and Technology Based Services.

These four areas have subsequently been adopted and promoted as smart specialisation priorities by NELEP.

Newcastle University made a significant contribution to the identification of the region's research and knowledge strengths as part of the RIS3 development process through their input into the 2013 analytical report for NELEP.

5.2 Gaps, barriers and challenges

The RIS3 was developed by NELEP in coordination with Newcastle University researchers (see 5.1), however, this was only to provide analytical and theoretical inputs. In this regard, Newcastle University was not directly involved in the actual development of the RIS3.

Another gap is that NCL has not been actively implementing the RIS3: there is some alignment between the priority areas in RIS3 and the strategic research strengths of Newcastle University, but this is mainly because these are based on existing research and innovation strengths. This fact suggests a lack of awareness and, maybe even, interest in the RIS3 developed, maybe also due to the lack of direct involvement of the university.

The region has some challenges to tackle, namely:

- Insufficient capacity of its workers
- Asymmetrical information for businesses

- Low productivity
- External competition
- Limited number of actors (only one science park (in Durham rather than Newcastle) and only a handful of business incubators and accelerators (some still emerging)

These factors show a lack of capacity of the region in becoming a more knowledge-based economy and, thus, turning R&D results into concrete solutions for the market. Of course, there are examples of innovation activities in the region, however, these are not widely disseminated throughout the region and to all actors.

The participants of the WP3 activities in Newcastle also mentioned that the lack of regional political autonomy has a negative effect. It was also pointed that the structure of NCL as highly decentralised hinders not only the collaboration and communication between the regional authorities and university, but also limits the management and monitoring of the work of the different departments towards RIS3.

The need for better monitoring of the regional economy that could be used to inform policy on an ongoing basis and the promotion of innovation success stories were also pointed as gaps by the participants.

5.3 Concrete actions

There are a number of challenges related with lack of communication, monitoring and lack of capacity of industry that can be improved through the adoption of some actions:

1. Monitoring of NCL actions towards RIS3 implementation
2. Closer communication between the NELEP and NCL departments
3. Dissemination of ongoing initiatives
4. Training for companies/ NCL's alignment with RIS3

Action 1.

Monitoring of NCL actions towards RIS3 implementation

OBJECTIVE:

As NCL is a large university where the departments have autonomy, fragmentation is a reality and, therefore, it is more difficult to monitor what is being done by NCL's staff towards the RIS3 implementation.

ACTIVITIES TO DEVELOP:

- Create a working group between all departments with a managing team
- Define a monitoring strategy (taking into account the research needs and interests and the RIS3 priorities) with key performance indicators, objectives and expected outputs
- Meet regularly to monitor the results and discuss them (also linked to action 2)

Action 2.

Closer communication between the NELEP and NCL departments

OBJECTIVE:

This action point is closely related with action 1 as the lack of communication would also be improved by the creation of a single contact point – in this case, the working group foreseen for monitoring purposes.

ACTIVITIES TO DEVELOP:

- Define what are the weak points in the communication and how to improve them
- Use the working group meetings to redefine strategies

Action 3.

Dissemination of ongoing initiatives

OBJECTIVE:

This action is also combined with the 2 previous ones (action point 1 and action point 2) as the decentralized structure does not help the dissemination of the existing initiatives for all the regional actors

ACTIVITIES TO DEVELOP:

- Creation of a specific section on the website with information on ongoing initiatives and their results
- Use of promotional materials and social media to disseminate information
- Promote science-business events where regional initiatives can also be promoted

Action 4.

Training for companies/ NCL's alignment with RIS3

OBJECTIVE:

The funding by businesses of professorships within universities was discussed during the workshop as a possible way of bringing research carried out in universities closer to industry needs. "Professor of Practice" is an idea already used by NCL for visiting professors with a background outside of academia. This could be adapted for the RIS3 priority areas as a way to strengthen the alignment of NCL research with the RIS3. These Professors of Practice could also provide short training programmes for companies on how to better implement R&D inputs in the companies' work.

ACTIVITIES TO DEVELOP:

- Analysis by the relevant departments at the university and by the companies to understand how to adapt and integrate the “Professor of Practice” initiative to the companies’ needs.

6. Action plan: Uniwersytet Łódzki

6. Action plan: Uniwersytet Łódzki

6.1 Context

The Uniwersytet Łódzki – University of Lodz (UL) was established in 1945 and is composed by 12 faculties, with programmes in 90 fields of study, 160 specializations, 50 postgraduate study programmes, and 7 doctoral programmes. More than 32 000 students attend the 12 faculties: Faculty of Biology and Environmental Protection, Chemistry, Economics and Sociology, Educational Sciences, International and Political Studies, Law and Administration, Management, Mathematics and Computer Science, Philology, Philosophy, History, and Physics and Applied Informatics.

The University of Lodz participated actively in the development of the Regional Innovation Strategy for the Lodzkie Region LORIS 2030, a process set-up in 2012 by the Marshall Office of the Lodzkie Region aimed at preparation of the renewed RIS3 strategy approach. The RIS3 of the Lodzkie region was developed through a task force with representatives of enterprises, scientific units (vice-rectors, scientific researchers), Technology Transfer Centres and administration authorities. The support was mainly to provide research and analytical inputs.

The process finished in early 2013, and after regional consultations the Strategy was officially adopted as binding document by the Regional Parliament (Sejmik) in May 2013. The main assumptions of the strategy have addressed the areas of 6 smart specialization, described below[2]:

Priority areas	Description
Modern Textile and Fashion Industry incl. design	Innovative solutions (technologies) in the area of raw materials acquisition for the textile industry (natural and synthetic); Innovative products and technologies in the area of technical textile products;

[2] Information taken from the S3 platform: http://s3platform.jrc.ec.europa.eu/documents/20182/231100/PL_Lodzkie_RIS3_Final.pdf/b00be20f-14a8-40eb-a180-c21b27e70dfa

	technologies and textual materials; personalization of textile industry products; production process optimization in the textile industry; IT tools supporting design, production and sales of textile industry products.
Advanced building materials (including design)	Acquisition and processing of natural mineral resources using innovative technologies for the production of construction materials with energy-saving and special properties, reuse of materials and use of waste, materials with improved thermal insulation, sound absorption, fire resistance or energy (including RES) properties; innovative wood materials with new functional properties; biopolymers, biocomposites and biologically inspired technologies; polymer materials; innovative use of mobile and control technologies in mineral extraction, processing, building materials manufacturing and smart construction; smart, integrated urban infrastructure management systems; intelligent building technologies and intelligent building project management software, including Building Information Modeling (BIM) technologies; Innovative application of functional technologies of multilayer textile materials - composite materials in construction to strengthen existing buildings of construction infrastructure and to perform new buildings

	using modern composite materials; Innovative applications of materials with shape memory (alloy) in construction.
Medical Industry, Pharmaceuticals and Cosmetics incl. health resort medicine	Innovative technologies for the manufacture of biotechnological medicines and generic products; innovative solutions for personalised medicine; development of new substances and materials for use in medicine, pharmacy and cosmetics; Innovative solutions for information technology tools for healthcare systems, pharmaceuticals and cosmetics; innovative solutions for optimization of manufacturing processes in the pharmaceutical, cosmetic and medical device manufacturing industries; solutions for process and organizational innovations in health care management, including the transfer of products and services to clinical practice;
Power generation (including Renewable Energy Sources)	Energy infrastructure solutions - smart grids; energy infrastructure management and control systems; IT tools to support management and decision support processes; innovative technologies to increase the efficiency of acquisition and use of alternative energy sources; in the field of energy efficiency improvement, and in particular - energy storage; concerning the use of renewable sources; enabling the development of distributed energy; concerning energy security; related to the

	reuse of waste, products and extraction sites; related to the activity of the consumer (prosumer energy).
Innovative agriculture and food processing	Creative breeding of plants and fungi of higher utility value; innovative fertilizers, biological preparations with dedicated application and controlled release and innovative biologically active substances for the production of plant protection products; rationalisation of water and energy management in agricultural production and reduction of negative impact on the environment; innovative technologies of cultivation and fertilisation of plants preventing degradation and improving soil quality, including the restoration of degraded soils and the protection of agricultural land; intelligent systems of monitoring, control and diagnostics in agriculture; innovative production of functional food, dedicated to various social groups and low-naturally processed food, based on product specialisation; food quality assessment systems and innovative technologies/systems that enable high quality food to be maintained during storage and processing (intelligent preservation and storage systems, biodegradable and functional packaging that protects quality, prolongs the shelf life of food products and enhances food safety); innovative food chain

	management systems; innovative technologies of cultivation and fertilisation of plants preventing soil degradation and improving soil quality, including reclamation of degraded soils and protection of agricultural land; extraction and processing of bioactive compounds and other raw materials from plant (including waste biomass) and animal materials, coming from the agri-food sector, intended for various branches of industry, including biofuels and other energy products, fibres from natural and processed raw materials, food supplements, medicines and cosmetics; innovative technologies in plant production, storage and agri-food processing, including intelligent and energy-efficient machinery and robotised workstations; innovative systems to ensure the achievement of hygiene standards and to secure equipment in agriculture, the agri-food industry; innovative technologies for renewable energy production and energy consumption management systems.
Computer science and telecommunication	Innovative software for intelligent cities and buildings, energy and transport networks (based on sensor networks); innovative applications of artificial intelligence in analytics, computing, robotics and games; intelligent bioinformatics and pharmacoinformatics applications in

	medicine, agriculture and animal breeding, as well as pharmaceutical and medical research; Innovative use of information technology in telemedicine and personalised medicine; advanced modelling of complex structures and simulations as well as analysis and optimisation of advanced structures (including aeronautical structures); intelligent ICT systems for optimisation of production, logistics and supply chain processes (m.); intelligent Internet technologies, including semantic technologies and the Internet of Things; intelligent applications of geoinformatics and satellite navigation systems; intelligent data management systems in networks, including cloud computing; innovative multimedia and games; Intelligent solutions for data and information security.

Table 2 – RIS3 priority areas in Lodzkie region

6.2 Gaps, barriers and challenges

The participants in WP3 activities pointed out several challenges to the RIS3 implementation in the Lodzkie region and, especially in the University.

In fact, the University of Lodz is yet in the process of developing a strategy for the implementation of RIS3 in its activities. Bureaucracy and low capacity of flexibility are one of the reasons for the slow adoption of new strategies. In addition, the cooperation between science and business is quite low and there are no support instruments for cooperation between scientific, academic and economic institutions. The research developed by the University of Lodz has little or no commercial and practical effect for the companies in the region and there is also

little opportunities for internships and research stays for students and researchers in the companies.

Another problem linked to this is the lack of knowledge from both science institutions and companies about intellectual property rights and patents, which hinders the cooperation opportunities even further. There is also lack of knowledge of scientific and technical capacity in the process of commercialization of technology. As a consequence, but also due to its characteristics, the local market has limited absorption of innovative products.

These facts results in insufficient trust and understanding between science and business, prevailing the insufficient willingness to cooperate. The lack of cooperation between entrepreneurs and research centers in Lodzkie region weakens the potential for more innovation and bigger research projects, narrowing to regional and, sometimes, national activities.

Lastly, there is a strong dependence on EU funds, which is definitely a barrier to further sustainable development of the region and its institutions in the different sectors.

6.3 Concrete actions

The information provided on section 6.1 and 6.2 on the context of the University of Lodz, the Lodzkie region RIS3 and the challenges and barriers for its implementation show some points that can be further improved.

The main problem is the lack of knowledge on how to establish cooperation between science and business. This can be improved by providing training to both companies and the researchers at Lodzkie region on aspects such as intellectual property rights and science management.

Another problem is the lack of trust between the two sectors, which can be diminished through cooperation activities.

The 4 actions suggested below can further support these needs:

1. Provide training for researchers on intellectual property rights, science management, and commercial approach to research.

2. Provide training for companies on intellectual property rights and commercial approach to research.
3. Promote sessions to explore how to get funding outside the EU programmes.
4. Create initiatives for the promotion of links between science and business, such as working groups and Science meets Business events.

Action 1.

Provide training for researchers on intellectual property rights, science management, and commercial approach to research.

OBJECTIVE:

Researchers at the University of Lodz need additional training on specific aspects of applicability of science research to the market, namely intellectual property rights, how to manage science research and how to interact with companies, as well as how to better align research with commercial needs.

ACTIVITIES TO DEVELOP:

- Disseminate a survey to researchers to understand their actual needs
- Define training sessions taking into account the needs of the researchers
- Include the training sessions in the training programme of the University of Lodz
- Monitor results and impact

Action 2.

Provide training for companies on intellectual property rights, and commercial approach to research.

OBJECTIVE:

The staff of the companies of the Lodzkie region need additional training on how to innovate in their activities and products and how to interact with the science institutions to leverage on the commercial use of the existing research done locally.

ACTIVITIES TO DEVELOP:

- Collect the needs of the staff to adjust the training offer
- Include the training sessions in the training programme of the companies
- Evaluate the impact and if any changes are needed

Action 3.

Promote sessions to explore how to get funding outside the EU programmes.

OBJECTIVE:

As the region is much dependent on EU funding, it is important to learn more about additional opportunities outside the EU programmes, investment, and other sources of funding. These sessions are important for all the actors involved (directly or indirectly) with the RIS3 implementation.

ACTIVITIES TO DEVELOP:

- Define programmes for these short sessions (that can be included in the agenda of bigger events) – see action 4
- Disseminate it to the different actors – university members, companies, established and potential entrepreneurs

Action 4.

Create initiatives for the promotion of links between science and business, such as working groups and Science meets Business events.

OBJECTIVE:

These initiatives are a first step for the promotion of cooperation between science and business as a way to understand how they can work together and increase trust, which is the main issue of the lack of interactions.

ACTIVITIES TO DEVELOP:

- Creation of a working group with representatives from the University of Lodz, the industrial chambers/parks, selected companies and the regional authority responsible for the implementation of the RIS3 initiative
- Promotion of annual events such as Science meets Business where researchers can present the work developed. In these events there could also be parallel sessions on investment, commercialization of products and others (see action 2 and 3)

7. Conclusions

7. Conclusions

The 5 universities included in this document – Universidade de Trás-os-Montes e Alto Douro, Universidad Politecnica de Valencia, Politecnico di Milano, Newcastle University and University of Lodz – as well as the regions in which they are inserted have very different levels of development, autonomy, and specialisation. The interactions between the universities and the regional authorities are also quite different from region to region.

Being so, these facts have led to different conclusions and suggestions described in the previous sections, however, it is interesting to note that there are also some comparable points, namely:

- The communication of the activities and results of the research and innovation activities of the universities to the general public and between departments could be improved.
- There is a lack of knowledge between companies and universities on how to better interact to actually implement the research and innovation results done at the universities.
- The monitoring results of the RIS3 are not always communicated and are not easily accessible.

It is also worth mentioning that some of the regions and universities are in a process of restructuring, for example, the NELEP in the Newcastle region. As the process is currently occurring, it was not possible to integrate these changes in the document due to the timeline of the project.