RE-ACT

HEINNOVATE for RIS3 tool
Description of dimensions and statements

(Draft July 2021)

RE-ACT

Self-reflection Tools for Smart
Universities Acting Regionally

Content

I. LEADERSHIP AND GOVERNANCE

1.1.   Definition of dimension

The effective involvement of an HEI in the smart specialisation process implies commitment and entrepreneurial orientation by HEI senior (higher) managers and decision-makers. Managerial, regulatory and infrastructural frameworks based on which HEIs interact with their external environment determine the extent of their participation and impact on regional innovation. This dimension underlines the most important steps and actions HEI senior managers decision-making structures should take in order to facilitate the HEIs participation in different phases of RIS3 design (including revision) and implementation (including monitoring and evaluation). It covers HEI senior managers' involvement in regional RIS3 governance structures, as well as other steps that HEI decision-makers should take in order to facilitate the institutions' internal involvement in RIS3 and the HEI's external involvement in the regional innovation ecosystem as part of the quadruple helix.

1.2.   Statements and their description

1.   The HEI is represented through its senior management in the highest governing body of RIS3 on a regional level.

RIS3 design and implementation is a bottom-up, collaborative process, involving stakeholders from the quadruple helix. These stakeholders, including academia, are brought together in entrepreneurial discovery processes and different region-specific governance structures to support the identification of new opportunities, but also to create ownership of the strategy and ensure stakeholder involvement during strategy design and implementation. A typical RIS3 governance structure at the regional level consists of a steering group, working groups and a management team. The steering group is the highest level RIS3 governance body, gathering high level representatives of regional stakeholders, including HEIs, and is responsible for the overall success of the strategy, together with the policy making organization.

To score highly, an HEI could, for example:

- Be represented in the RIS3 steering group by a person from senior management, actively contributing to coordination with other RIS3 governance structures and to the integration of stakeholder viewpoints in the design and implementation of the strategy,

- Actively encourage a culture of collaboration with other steering group members and further external and internal partners to contribute to the success of the RIS3,

- Provide institutional support in the design, and implementation of the strategy,

- Act as one of the leaders of the RIS3 at regional level, contributing to efficient communication about the importance of smart specialisation and to the mobilization and involvement of a wide variety of stakeholders in the entrepreneurial discovery process,

- Cooperate with other members of the governance structure to support local and regional policymakers in addressing complex policy, practical and societal challenges.

2.   The HEI is strategically committed to implement its third mission taking into account RIS3 objectives.

The HEI asserts its entrepreneurial role (locally/ regionally/ nationally/ internationally), as well as its vision and priorities related to its involvement in RIS3 design and implementation. Therefore, the strategy of an HEI which reflects its entrepreneurial aspirations and agenda should also incorporate the RIS3 objectives, ensuring the institution's effective contribution to the strategy success, in line with its research and innovation profile.

To score highly, an HEI could, for example:

- Incorporate into its mission statement and internal strategy the HEI's contribution to the vision and objectives of RIS3,

- Emphasize in its strategy the importance of smart specialisation and the smart specialisation priority areas or domains to which the HEI aims to contribute,

- Have a strategy implementation plan with measures and indicators aligned to RIS3, clearly stating how the HEI contributes to the success of the strategy,

- Promote institutional participation in RIS3 through internal measures aimed at ensuring the effective participation of the HEI staff in the relevant phases of RIS3 design and implementation, including monitoring, evaluation, as well as strategy revision,

- Strategically support and stimulate the participation of the HEI in European and international institutional

partnerships and research and innovation focused networks to foster transnational and interregional cooperation in line with the RIS3 objectives,

● Strategically encourage cooperation and collaboration with external regional stakeholders both formally and informally.

3. Senior management of the HEI ensures that processes, procedures and internal communication measures facilitate the HEI's participation in key steps of RIS3 design and implementation.

An effective involvement of an HEI in RIS3 design and implementation must be based on the involvement of staff members from different institutional levels with different roles and responsibilities – researchers, faculty or research leaders, technology transfer experts, administrative personnel, etc. -, depending on the expertise needed and type of action required. In addition, it requires integration of wider social and economic aspects. Optimal communication flows and internal rules facilitating various types of participation are needed for an effective involvement.

To score high, an HEI could, for example:

● Ensure that there is a RIS3 dedicated person within the higher management of the HEI (for example, Vice Rector or Pro-rector for Entrepreneurship and Innovation or someone with a similar status),

● Create clear and concrete mechanisms to involve researchers and innovators into RIS3 related activities,

● Establish functional communication flows with incorporated feed-back loops to:

   ◦ enable concentration of all RIS3 related information and requests in one place, as well as transparent information sharing with dedicated HEI staff,

   ◦ prompt responsiveness to the requests of RIS3 partners and other stakeholders,

● Reconfigure internal processes and procedures to:

   ◦ enable and support (administratively, organisationally and financially) the involvement of staff and that of the institution in RIS3,

   ◦ support participation of staff at innovation capacity building trainings,

   ◦ encourage cooperation and collaboration with other stakeholders from and outside the region through network participation,

   ◦ incorporate broader regional, social and economic aspects, including problems and challenges, into its agenda and decision-making.

4. HEI is able to reach out to and attract key innovators from the faculties into the entrepreneurial discovery process and RIS3 implementation.

The involvement of researchers and innovators with entrepreneurial mindset and/or good research results in RIS3 should be facilitated. This involvement should be effectively encouraged by the HEIs senior management and stimulated by the HEI's internal environment.

To score high, an HEI could, for example:

● Communicate effectively the importance of RIS3 and the benefits of participating in RIS3 related activities for individual staff members and the HEI as a whole,

● Motivate and mobilise staff to take a proactive role in RIS3, especially in the entrepreneurial discovery process and in the generation and development of projects linked with RIS3 implementation.

5. Every HEI employee involved in RIS3 has equal access to all information; the principles of transparency and participation are consistently applied.

An open, participatory and inclusive decision-making model within the institution can contribute to an effective and efficient participation of the HEI in RIS3. For that to happen, it is of key importance that all those involved in RIS3 activities at the HEI have easy and seamless access to the relevant information and are able to contribute to the overall institutional involvement.

To score high, an HEI could, for example:

● Create centralised data repositories and communication channels to ensure equal access of staff to relevant information in a timely manner,

● Introduce models of shared leadership and ownership to balance competencies between senior management and various faculties, departments, R&D institutes and technology transfer offices within the HEI,

● Promote participatory and transparent decision-making models.

II. ORGANISATIONAL CAPACITY: FUNDING, PEOPLE AND INCENTIVES

2.1. Definition of dimension

The HEI should take an active role in contributing to RIS3 objectives and addressing regional needs, making the best use of its knowledge assets and of available external public and private funding opportunities. To this end, HEIs should build appropriate internal structures, as well as encourage flexibility and adaptability. This section covers all internal organisational aspects that should be in place at the HEI to support its participation in RIS3 processes.

2.2. Statements and their description

1. The HEI maintains a structured, up-to-date registry of its internal knowledge assets.

HEIs can contribute in several ways to the structural transformation of the regional economy through innovation, as well as by addressing social needs and challenges. To this end HEIs should assess their strengths and weaknesses in terms of human capacities and knowledge so that they are able to mobilise the best available resources, when needed, as well as to be able to build new capacities.

To score high, an HEI could, for example:

- Internally map the competencies, skills and expertise of its human resources, as well as activities, projects, scientific results and other relevant assets that are related to RIS3,

- Establish a structured internal database containing a register of knowledge assets that permits searches based on keywords and smart specialisation priority areas, i.e. the economic, scientific and technological fields to which these priorities are linked, as well as interlinked challenges,

- Periodically update the database through internal mapping or update it continuously based on inputs and data uploaded by staff (academia, researchers, experts, etc.),

- Match competencies, skills and expertise with regional needs and objectives highlighted in RIS3 to support the identification of gaps and to create synergies,

- Support the development of new competencies and capacities to address the identified gaps.

2. The HEI has dedicated qualified personnel to support academics and researchers in research and innovation.

Staff involved in research, development and innovation (RDI) activities may have difficulties in finding the time needed to obtain necessary funding and resources or in dealing with administrative issues and may lack the necessary expertise. They may also have similar difficulties in orienting their research towards market and society needs. Thus, academics and researchers should be supported by dedicated personnel to be able to concentrate on their core activity.

To score high, an HEI could, for example:

- Have dedicated and skilled staff to support researchers and academics in raising public funds for research and innovation, including:
  - gathering and integrating data and information available at regional, national, European and international level on funding opportunities and calls, ensuring transparent and timely dissemination of information,
  - maintaining a database of project ideas proposed by academics and researchers and providing support in finding relevant funding opportunities,
  - supporting the development of project ideas into applications, including compliance with administrative and eligibility requirements, as well as assistance in finding partners,
  - assisting in the contracting process the technical and financial implementation of projects, including compliance with visibility and communication requirements, as well as in project closure.

- Have experts that support academics and researchers in orienting their activities towards economic and societal needs, including:
  - mapping market and societal needs and trends,
  - facilitating communication and collaboration between academics, researchers, businesses and society through the organization of events or dedicated platforms,

- Have dedicated personnel working with the RIS3 responsible organisation(s) and disseminating relevant information towards HEI staff involved in research and innovation in a timely and equitable manner,
- Transfer relevant information from staff involved in research and innovation activities towards the RIS3 responsible organization.

3. The HEI has organisational structures dedicated to knowledge and technology transfer that cover the smart specialisation priority areas.

The transfer of knowledge and technology to businesses and society is an important step in turning research results into innovation that can have an impact on regional development in general and on the structural transformation of the economy in line with RIS3 objectives. This activity is also an important source of private fund attraction.

To score high, an HEI could, for example:

- Have a dedicated internal organisational structure that deals with the full range of traditional knowledge and technology transfer services[1], covering all scientific areas of the HEI, including the ones relevant for RIS3,
- Offer services complementary to knowledge and technology transfer ones, such as other specific business and innovation related services, e.g. elaboration of market studies, business plans,
- Continuously upgrade knowledge and technology transfer services and related infrastructures to involve a variety of stakeholders (citizens, consumers) in open and co-creative knowledge and technology transfer activities,
- Enable the knowledge and technology transfer structure to operate independently from an administrative and financial point of view,
- Be engaged in joint research and development programmes, science and technology parks, innovation hubs, or other similar facilities.

4. The HEI promotes multidisciplinary cooperation among different departments/faculties/research units in accordance with business and society needs.

Market and societal needs are complex and in many cases can be addressed by combining different types of scientific knowledge, approaches and methods and/or by combining different scientific and/or technological fields.

To score high, an HEI could, for example:

- Bring together within a single infrastructure all researchers and equipment dedicated to research,
- Encourage the exchange of research ideas between research teams,
- Facilitate and encourage the internal mobility of researchers between research institutes and centres and/or stimulate establishment of multidisciplinary teams to develop solutions addressing business and society needs,
- Cooperate with other regional HEIs, with complementary or different research profiles, on joint research and innovation projects.

5. A system of rewards is in place to involve staff from different departments of the HEI in research and innovation activities

Participation of academia and researchers, as well as of staff and students dedicated to RIS3 should be rewarded in line with a motivational framework established at the institutional level and based on objective criteria. Such a reward system could also contribute to talent attraction and retention.

To score high, an HEI could, for example:

- Ensure that performance-assessment frameworks for academic careers take into account the involvement in RIS3 related activities at regional, national, European and international level as well as RIS3-related achievements – different from scientific articles, licenses and patents,
- Implement hybrid work models (a flexible arrangement of onsite and offsite work) for researchers,
- Offer individual and institutional incentives to promote entrepreneurial agenda and to build relationships with

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[1] Such as: IP protection and management - i.e. facilitating the commercialization of research findings, registering or selling university-owned patents, licensing out university-developed patented technologies to existing companies, assisting in the protection of university patents-, managing collaborative research contracts, organizing joint university–industry conferences or other forums to manage joint research projects and business ventures, setting up information portals for business partners, and supporting university spin-off enterprises, etc.

stakeholders beyond academic boundaries,

- Offer periodically, based on transparent rules and objective criteria and in line with the results achieved:
  - non-financial rewards, such as recognition, diplomas, awards, etc.
  - financial rewards, such as prizes, a share of revenues from technology transfer contracts, incentives, etc.

6. The HEI makes the best use of available funding opportunities for research and innovation to contribute to RIS3 objectives.

A variety of funding sources may be available for research and innovation projects that could be harvested in line with RIS3 objectives. These may come from regional and national public budgets, as well as from European or international public sources, but also from private funds.

To score high, an HEI could, for example:

- Establish an internal portfolio of project ideas and prioritize those that can contribute to RIS3 objectives,

- Provide the description of project ideas to the RIS3 responsible organization in order to be taken into consideration in the regional portfolio of projects (if one exists),

- Participate in the entrepreneurial discovery process in order to present and/or support project ideas to other types of stakeholders and, when appropriate, form partnerships with them for further developing the ideas or to attract private capital for their implementation,

- Continuously explore funding opportunities to identify relevant calls for RIS3 related projects,

- Prioritize RIS3-related projects when taking internal decisions regarding project applications to be developed and submitted,

- Act proactively and build European and international partnerships to address regional challenges.

III. ENTREPRENEURIAL TEACHING AND LEARNING

3.1. Definition of dimension

The availability of skilled human resources appropriate to the regional economic structure and research and development specialisation is of key importance. The match between the supply of education at all levels and regional human resource needs is one of the important aspects covered by the early smart specialisation concept. HEIs have an important role to play in developing specialised human resources, as well as in supporting the development of more transversal skills necessary for smart specialisation. In fact, HEIs have a twofold role in order to promote the regional human capital: provide horizontal competences, and answer to specific needs through specialised programs. The latter can be co-created with local partners. This dimension concerns the educational role HEIs can play in order to provide human capital in line with market needs, as well as in supporting students in developing skills and in acquiring competencies related to smart specialisation. In addition it covers other types of educational programmes that an HEI could provide, particularly for employees of companies, in order to stimulate the development of entrepreneurial and innovative mindsets and capacities.

3.2. Statements and their description

1. The HEI graduate programmes provide knowledge and skills related to RIS3.

HEIs can also contribute to RIS3 in the context of their primary mission, as providers of specialized future workforce. Ideally, the higher educational offer - at all levels of education, i.e. BA, MA, PhD – should support to some extent structural transformation in smart specialisation priority areas, through the provision of skilled human resources.

To score high, an HEI could, for example:

- Periodically update its curricula in order to match market needs and specifically the needs related to smart specialisation priority areas,

- Be open to incorporate into its higher educational offer programmes that provide students with knowledge and skills necessary for future economic, social and technological challenges,

- Integrate the results of entrepreneurial research into its educational offer,

- Cooperate with businesses to map and gather information on their human resource needs,

- Enter into partnerships with enterprises to offer jointly developed programmes, e.g. internships, student placements, industrial PhDs, and thus promote the development of practical skills,

- Develop horizontal or transversal programmes (even optional courses) to enable students to acquire knowledge and skills related to research and innovation,

- Adapt the content and examination methods towards teaching and assessing skills rather than assessing specific knowledge, offering more individualized programs,

- Provide courses with a societal orientation, such as citizenship, policy debate, environmental awareness, cultural enlightenment, sustainable development and general well-being of the population,

- Adopt new student centric and problem based teaching methodologies.

2. The HEI delivers training programmes to support the upskilling and reskilling of staff in the smart specialisation priority areas.

Besides graduate programmes, HEIs can develop and deliver training programmes that support the continuous learning of employees of businesses, with an emphasis on employees from the priority areas of smart specialisation. It can also offer training courses that contribute to general capacity building of employees from the regional innovation system in innovation-related matters.

To score high, an HEI could, for example:

- Create and deliver training or educational programmes for employees of companies for their further development as part of an adult learning or continuous education offer,

- Develop and offer on-demand training programmes tailored to the needs of companies in order to teach employees how to efficiently use and exploit new technologies,

- Offer training programmes that develop research and innovation related knowledge and skills of employees, developing the capacity of actors from the quadruple helix and contributing to the interconnection of the regional innovation system.

IV. PREPARING AND SUPPORTING ENTREPRENEURS

4.1. Definition of dimension

As an important actor in the regional innovation system an HEI can support research and innovation in smart specialisation priority areas in several ways. Extensive levels of market-oriented regional engagement and involvement in regional R&I networks are two crucial factors for an HEI to have regional impact. Alongside, physical capital, such as TTOs and business incubators, can boost spin-off companies. Such companies can create a regional impact not only through innovation, but also by job creation. This dimension relates to the role an HEI should play in launching new or improved products and processes to the market through targeted support to existing companies, as well as by facilitating the commercialization of in-house research results through the creation of new innovative companies.

4.2. Statements and their description

1. The HEI supports companies active in the smart specialisation priority areas in their research and innovation activities.

HEIs should develop specific research and innovation services tailored to the needs of established large and medium-sized companies. In addition, they should support the research and innovation activities initiated by small and micro companies. To this end, HEIs may enter into collaborative research activities or offer enterprises access to their research and innovation infrastructure.

To score high, an HEI could, for example:

- Have in its internal organisational structure or in a separate organisation an entity offering tailored R&I services for companies operating in economic areas covered by smart specialisation priority domains in research stages such as experimental development, industrial research,

- Offer companies access to R&I facilities and equipment, as well as services for testing, validating and prototyping new products,

- Have dedicated infrastructure, equipment and researchers involved in collaborative research projects with companies,

- Have dedicated facilities and/or platforms that enable co-creation processes involving companies, researchers, students and/or consumers, e.g. Living Labs, Fab Labs, etc.

2. HEI develops and provides services to support entrepreneurship and innovation in companies.

Successfully commercializing or bringing research results to market is complex and entails risks, including financial ones, as the well-known valley of death. In addition to the specific problems that can occur in the latter stages of research and innovation activities, innovation can also be blocked due to lack of knowledge of companies about certain aspects linked to innovation, or their lack of capacity to address them, as well as by problems characteristic of the demand-side. To foster innovation on a regional level, HEIs can develop and offer complementary services that specifically tackle these problems, in addition to specific R&I services.

To score high, an HEI could, for example:

- Develop and offer innovation support services, such as the development of business plans, market studies, go-to-market strategies, marketing and branding strategies,

- Develop (access to funding) services to support entrepreneurs in accessing public funds and private capital (such services may range from providing information about funding opportunities to a partial or full support for the development of the funding application),

- Develop and offer services that support growth of enterprises and expansion into internal and international markets, like acceleration programmes and services, scale-up services,

- Support commercialization of innovative goods and services through demand-side intervention, i.e. by building the market/request on behalf of consumers for innovative products.

3. The HEI provides RIS3 partners with access to information on prospective research results that can be commercialized.

The lack of information about ongoing research and development activities, as well as about expected and achieved results can hinder the uptake of research results of HEIs by companies. Thus, HEIs should ensure that entrepreneurs have access to information on current and prospective research results.

To score high, an HEI could, for example:

- Offer information on commercialisable research results, in a targeted manner, towards companies, upon request,

- Regularly organize match-making or brokerage events for researchers and entrepreneurs to offer information about ongoing research and prospective R&D results,

- Have a dedicated website or a section on the HEI's website that offers such information in an equal and transparent manner to all interested parties.

4. The HEI supports its researchers and students in establishing innovative start-ups and spin-offs, especially in smart specialisation priority areas.

Bringing research results to the market in the form of new goods and/or services cannot only happen through technology transfer towards already existing companies, but also through the creation of new businesses. To this end HEIs can support students and researchers in establishing their own innovative start-ups or create spin-offs.

To score high, an HEI could, for example:

- Organize events and competitions for innovative business ideas proposed by students or researchers individually or in teams, such as business plan competitions, Boot-camps, Hackathons, Jumpstarter events, Innovation camps, Techdays, etc.

- Mobilize private capital through the involvement of business angels, venture capitalists, etc. to provide seed funding for the development of most promising innovative business plans,

- Access public funding, if available, to provide funding for start-up or spin-off creation,

- Support the establishment of spin-offs through a transparent internal selection process, based on objective criteria,

- Offer support for the establishment and further development of start-ups and spin-offs in its specialised facilities ranging from legal assistance to more complex services such as support for access to funding or incubation and acceleration.

V. DIGITAL TRANSFORMATION AND CAPABILITY

5.1.   Definition of dimension

Building digital skills and the use of digital technologies in the economy and society is fundamental for digital transition, but also a source for new or improved products (goods and services). This dimension refers to actions HEIs can take not only to exploit the opportunities offered by novel digital technologies, but also to support other stakeholders from the region in the uptake and use of such technologies.

5.2.   Statements and their description

1.   The HEI uses the advantage of digital technologies to foster innovation on a regional level.

Digital technologies can be used in all scientific and economic activities, as well as different areas of life, including research and innovation. HEIs can capitalize on the advantages of such technologies in order to contribute to regional development through innovation.

To score high, an HEI could, for example:

- Develop digital platforms to support technology transfer and cooperation between researchers and entrepreneurs,

- Develop and run digital platforms to support knowledge and data diffusion and involvement of quadruple helix stakeholders in regional innovation,

- Offer companies a "test before invest" experimentation service, supporting them to respond to digital challenges.

2.   The HEI supports digital transition at regional level.

Uptake and use of digital technologies was an important aspect in the concept of smart specialisation and plays an important role in research and innovation. Relying on their infrastructure and knowledge, HEIs can bring an important contribution to digital transition both in the economy and society.

To score high, an HEI could, for example:

- Offer technology transfer services in the domain of digital technologies.

- Cooperate with or be involved as a partner in a regional digital innovation hub.

- Establish and run its own digital innovation hub.

- Specialise and become an European Digital Innovation Hub, offering services for all EU regions, connecting in a network with other hubs.

3.   The HEI contributes to the uptake and the dissemination of the latest digital technological advancements

Some of the latest digital technologies – e.g. cyber security, Internet of Things, quantum computing, high performance computing, cyber-physical systems, etc. - are considered a key to innovation and digital future. Part of them are also considered key enabling or generic technologies – like artificial intelligence - with an important role in retaining competitiveness of industry and scaling up on new markets. HEIs can have a role both in the development and dissemination of such technologies. They can pursue the latest technological advances in the digital field and seek to leverage the new opportunities for smart specialisation in non-traditional and new areas of economic activity.

To score highly, an HEI could, for example:

- Contribute to the dissemination of novel digital technologies and their uptake in research and in the economy,

- Orient research towards the development of such technologies and their use in new domains,

- Develop infrastructures and provide adequate training to support the use of these digital technologies,

- Foster participation in European and international projects and/or networks, like the Digital Europe Programme or one of the Knowledge and Innovation Communities under EIT Digital.

VI. KNOWLEDGE EXCHANGE AND COLLABORATION

6.1.   Definition of dimension

Innovation relies very much on sharing and reinterpretation/recombination of existing knowledge through a continuous collaborative process among the different actors from the Quadruple Helix. Smart specialisation priority areas are often located at the intersection between science areas, technology fields and economic activities, implying the application of multidisciplinary approaches and 'boundary spanning' between research or academia and industry, at the same time being responsive to specific societal challenges. Collaboration between HEIs and other regional public and private institutions, as well as society can also support alignment of supply and demand for knowledge and skills, especially in a RIS3 context. This section refers to the ability of HEIs to build and sustain relationships with key regional, national and international partners in order to be able to respond to regional needs, as well as to contribute to the creation or enforcement of linkages within the regional innovation system.

6.2.   Statements and their description

1. HEI supports innovation in smart specialisation priority areas through collaboration with other regional quadruple helix (QH) stakeholders

Entrepreneurial discovery as a continuous process underpins smart specialisation as part of a broad stakeholder involvement and bottom-up planning process. The entrepreneurial spirit of this discovery must involve representatives of the quadruple helix, including HEIs. Besides active participation in entrepreneurial discovery, HEIs should foster pro-active dialogue and connections with and between regional key actors, acting as a key regional player in line with their third mission. Moreover, HEIs are able to bring together the entrepreneurial and innovation communities to leverage the strengths of a region, supporting the regional government in policy design and implementation.

To score high, an HEI could, for example:

- Participate in entrepreneurial discovery focus groups organized by the RIS3 responsible organization, cooperating and interacting with other Quadruple Helix stakeholders and supporting the development of partnerships,

- Have informal ties and communication channels with other relevant RIS3 stakeholders through which knowledge and information is shared and recombined,

- Have formal ties - e.g. partnership agreements, cooperation agreements,   institutional arrangement, such as a council or committee - with relevant RIS3 stakeholders and regular discussions oriented towards solving social and economic needs,

- Participate in various events with other regional stakeholders, for example at networking or match-making events organized by other actors,

- Foster long-term and sustainable relationships with RIS3 stakeholders for the benefit of the region instead of project-based cooperation,

- Collaborate with other higher education institutions in the region as well as with R&D organizations and technology transfer centers to enhance exchange of scientific and technological knowledge, to capitalize on complementary research assets and to jointly develop related services.

2. The HEI supports the regional RIS3 responsible organization(s) in the strategy development and implementation.

Besides participation in RIS3 governance structures and in the entrepreneurial discovery process, or in the generation, development and implementation of RIS3 related projects or contribution to strategy monitoring and evaluation, the HEI can be actively involved in other steps of RIS3 design and implementation, as well. This involvement can be related for example to performing the socio-economic analysis or the RDI analysis, update of the project portfolio, active participation in project development labs, elaboration of studies linked to the revision of smart specialisation priority areas or development of financing instruments and calls for proposals, etc.

To score high, an HEI could, for example:

- Contribute to the analysis of regional research and innovation assets by providing relevant data linked to planned and ongoing R&D activities, tangible and intangible R&D assets, etc.,

- Support the identification of societal challenges that need to be addressed at regional level,

- Perform specific analysis and/or elaborate studies to support strategy design and/or implementation,

- Support the evidence-based identification of competitive advantages and unique resources,
- Alert policy-makers to information regarding global trends through its European and international networks,
- Work closely with the organization responsible for RIS3 linked to the smart specialisation policy process.

3. HEI supports university-industry links and mobility.

Cross-sectoral links and mobility are an important way of transferring, exchanging and combining knowledge between different fields and sectors, i.e. between HEIs as knowledge providers and industry as knowledge explorers, and can result in creating new value and innovation. Bringing researchers from HEIs and industry together, additionally promotes new business opportunities, can result in the establishment of new businesses and create new areas of economic development.

To score high, an HEI could, for example:

- Have cooperative PhD programmes with the industry (industrial PhDs),
- Have staff mobility programmes with industry,
- Have student internship programmes,
- Have a joint R&D agenda with industrial partners,
- Share equipment and facilities with companies.

4. The HEI facilitates cooperation between Quadruple Helix actors.

Effective and efficient quadruple helix cooperation and a connected regional innovation system are of key importance for smart specialisation. Besides playing a key role as a regional actor, HEIs can also contribute to creating new or enforcing existing connections and ties within the regional innovation system. HEIs can also act as a catalyst for the harmonization of different interests and perspectives, as well as contribute to the improvement of RIS3 governance structures.

To score high, an HEI could, for example:

- Exploit new Quadruple Helix cooperation opportunities among regional stakeholders, through the organization of dedicated events,
- Contribute to and support experimentation with new stakeholder involvement and RIS3 governance models,
- Actively promote engagement towards societal challenges and sustainability, enabling quadruple helix actors to enact values and proactive attitudes towards issues of regional importance,
- Run collaborative processes with other actors of the quadruple helix to address emerging economic and societal challenges,
- Liaise between and bring together the entrepreneurial and innovation communities, as well as citizens to exploit strengths and challenges of the region, acting in parallel as an intermediary with the organization in charge of regional policy.

5. HEI analyses the current and future needs of society and business, providing the knowledge to respond to the challenges

Smart specialisation strategies take into account to a large extent the challenges society and enterprises are facing. RIS3s should primarily aim for economic transformation but should also contribute to the transformation of society and of socio-technical systems. Besides the needs and challenges incorporated during strategy design, new ones may emerge within the policy cycle or in the span to the next one, and might need to be tackled. Some of these challenges can be anticipated, while others need quick responses and reactions as soon as they appear. HEIs can play an active role not only in addressing challenges already identified, but also in anticipating future needs and in tackling unexpected disruptions, contributing to social and economic resilience.

To score high, an HEI could, for example:

- Conduct foresight and forecasting activities linked to future societal needs and, based on findings, develop capacities, initiate internal changes, projects and actions to meet identified needs,
- Respond to current challenges and needs the community and society are facing, and become a catalyst of regional development, socio-technical system transformation and resilience,
- Be oriented towards the needs of the economy and of companies from smart specialisation priority areas both in education and research-innovation.

VII.   THE INTERNATIONALISED INSTITUTION

7.1.   Definition of dimension

HEIs play a key role in connecting a region to international knowledge flows relevant for RIS3 and are a gateway for accessing extra-regional knowledge sources. Integration into larger knowledge flows through wider networks can be of particular importance for the regional innovation system, since it can result in the transfer of knowledge and technologies that are necessary for the industry, but are not available within the region. This section looks at the HEI participation in knowledge exchange international projects and networks, both formally (when there is a formal agreement for HEI involvement) and informally (where it arises from interpersonal relationships that researchers or research teams build individually). It also emphasizes the nodal role HEIs have in transposing regional ambitions to the international arena and in supporting the regions' integration into global value chains, as well as reaching out from the region to solve region-specific needs.

7.2.   Statements and their description

1. The HEI participates as a partner in European and international R&I projects.

Alongside their tailor-made character to regional assets and specific bottlenecks, smart specialisation strategies should also have an outward looking character and put emphasis on the integration in European and international value chains and knowledge flows. HEIs can develop strategic interregional partnerships and support these aims, additionally contributing to synergies between regional and European or international funding instruments. Participation in such projects can not only capitalize on regional assets, but can also respond to regional needs and challenges.

To score high, an HEI could, for example:

- Be part of interregional partnerships supported under one or more of the three smart specialisation platforms, i.e. Agri-food, Energy and Industrial Modernization,

- Participate in Vanguard Initiative or other similar interregional, supraregional or transnational initiatives,

- Become a member of or affiliate with an EIT Knowledge and Innovation Community, i.e. EIT Digital, EIT Urban Mobility, EIT Raw Materials, EIT Energy, EIT Climate, EIT Health KICs, etc.

- Initiate   and coordinate European and international partnerships and projects developed to tackle region specific needs and challenges in line with RIS3 objectives,

- Foster   complementary participation of relevant regional actors in such European and international projects,

- Capitalize on joint results after the projects' lifetime to improve educational and R&I offer, as well as the institutions' regional embeddedness.

2.   The HEI links the region to external knowledge sources.

Regional actors involved in RIS3 processes and regions should rely on external knowledge acquisition that can help them to improve their regional knowledge base and support specialisation. By combining international focus and local commitment, HEIs should connect the region to external sources of knowledge through their formal or informal networks, acting as a link between global and regional/local levels, absorbing relevant knowledge available and sharing it with other regional stakeholders. These linkages should also be used to address specific social challenges faced by the region.

To score high, an HEI could, for example:

- Become a gateway for importing and disseminating in the region latest technological advancements,

- Actively search for information and knowledge sources that could support the region in addressing region-specific challenges,

- Play a relevant part in facilitating the connection between regional   actors and European or international counterparts,

- Contribute to bringing the industry sectors closer to the internationalized R&I,

- Facilitate or intermediate (through their TTOs) technology transfer from the outside to companies from their region,

- Link the region with international/European centers of excellence.

3. The HEI is engaged in European and international R&I networks.

Participation in European and international educational or research and innovation networks fosters integration into knowledge flows and can contribute to knowledge exchange (sharing and accessing relevant knowledge) and partnerships in line with regional needs and smart specialisation objectives. Being part of both formal and informal European and international networks, HEIs can bring a valuable contribution to regional development.

To score high, an HEI could, for example:

- Connect with researchers and academics, as well as with experts from other types of organizations at European or international level through informal links,

- Support membership of researchers and academics in European and international scientific organizations,

- Support researchers to participate at European or international conferences, as well as in brokerage and match-making events with other actors from the quadruple helix,

- Actively participate in European educational and R&I networks, such as European Research Area (ERA) or the European Higher Education Area (EHEA),

- Participate in other relevant initiatives, such as the European University Association or European Association of Institutions in Higher Education, University-Industry Innovation Network.

VIII.   MEASURING IMPACT

8.1.   Definition of dimension

Monitoring and evaluation of intended outputs and outcomes is at the core of RIS3 and ideally policy responsible organizations should involve regional key actors in these processes, including HEIs. From another point of view, an HEI committed to contribute to smart specialisation objectives should also monitor the implementation and impact of its own RIS3 related actions in order to be able to make necessary adjustments. This section concerns not only internal monitoring and evaluation measures that should be in place within the HEI, but also refers to the support an HEI can offer to the RIS3 responsible organization in the overall monitoring and evaluation of the strategy, through provision of data and the development of new methods and tools for monitoring and evaluation.

8.2.   Statements and their description

1. The HEI is actively involved in participatory RIS3 monitoring, evaluation and learning activities

Due to the transformative character of the policy and its specific vertical intervention logic, as well as experimental character, monitoring and evaluation of RIS3s cannot solely rely on statistical or programme indicators that are usually available. Additional quantitative information should be collected and interpreted and there is a need for new indicators and data collection methods. These can cover for example the development of interdisciplinary approaches to data collection for new indicators; new methods to improve measurement of innovative activity in complex or emerging business areas, organizations and networks, or of skills required in innovative workplaces, or of the use of emerging and enabling technologies, as well as of social innovation and impact of innovative activity on society, etc. HEIs can support both data collection and the definition of new indicator systems, as well as develop methodologies for monitoring and evaluation. Not least, HEIs committed to their third mission and contributing to RIS3 should also periodically assess its own achievements linked to RIS3. Monitoring and evaluation of internal actions can not only support adjustments and improvements of the HEI's activity, but could serve as a valuable information source for the RIS3 responsible organization.

To score high, an HEI could, for example:

- Support RIS3 monitoring, evaluation and learning by providing information and data connected to its own R&I activity, including participation in European and international projects and networks,

- Participate, together with other actors, in the regular review of the theory of change, according to RIS3 interventions, results and impact,

- Assist the RIS3 responsible organization in monitoring by analyzing data and making recommendations based on results,

- Review or propose new indicators and data collection techniques to support the development of the RIS3 monitoring and evaluation system,

- Provide and develop novel tools and methods to assess the impact of RIS3 on regional development both from an economic and social point of view,

- Perform alone or in a consortia with other organizations the impact evaluation of the RIS3,
- Engage in monitoring experts working groups to support the regional administration in monitoring through a multidisciplinary approach.

2. The HEI measures its own contribution to reaching RIS3 objectives.

An HEI strategically committed to developing its third mission and entrepreneurial profile, and to contributing to regional development through smart specialisation, should put emphasis on measuring to what extent its internal actions contribute to RIS3 objectives. Similarly, an HEI should understand the impact of its own RIS3-related activities. Measurement of its own contribution to RIS3 implementation cannot be only used for improvement at the level of the organization, but also pertain to the way an HEI can support RIS3 monitoring and evaluation performed or initiated by the policy responsible organization.

To score high, an HEI could, for example:

- Periodically monitor outcomes of its own activities linked to RIS3 according to previously set milestones,
- Revise internal actions based on the results of the monitoring,
- Perform evaluation of its own RIS3 related actions to measure its impact on RIS3 result and context indicators,
- Engage in a continuous learning process with other actors to identify inhibiting and accelerating factors for the achievement of RIS3 objectives.