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IMPLEMENTING SMART SPECIALISATION STRATEGIES

A HANDBOOK

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Preface

I am delighted to introduce this handbook on "Implementing Smart Specialisation Strategies", and this is because, six years ago, it was the European Commission who launched smart specialisation as a new powerful policy approach. Since then, it has come to be seen as a crucial element in promoting economic transformation towards smart, sustainable and inclusive growth.

In those six years, smart specialisation has become a key instrument for place-based development. It now represents the most comprehensive policy experience on implementing innovation-driven progress in Europe. It is a cornerstone in the European Union's endeavour to continue driving countries and regions from recent setbacks onwards to success, and to guarantee opportunities for each and all of its territories. Thanks to this effort, for the first time, public authorities and stakeholders across an area of more than five hundred million inhabitants have crafted their innovation policy according to a common set of principles and methodologies.

I am very proud to see how smart specialisation strategies have progressively become a reality, thanks to the collaborative work of public authorities, businesses, researchers and civil society. And I am committed to support further the implementation of those strategies, knowing how challenging can be to turn the strategic documents into fully operational tools. This Handbook is a step in this direction. It should help in showcasing implementation examples from all over the EU.

The handbook integrates contributions of practitioners from Members States and regions across Europe, providing both reflections on how interventions behind Smart Specialisation should be designed, and on how practical guidance based on good practices can show the way forward. I want to see effective solutions for tough problems, and here I see the experiences from which we can learn.

I encourage all the authorities and stakeholders involved in the implementation of programmes to make full use of this Handbook. It is an open document. I invite all practitioners to share their experience in implementing smart specialisation. It will build a collective and practical knowledge, so that this Handbook can be enriched, showing examples that can be applied in the real economy.

Corina Crețu
European Commissioner for Regional and Urban Policy

Introduction

Smart specialisation: from design to implementation

Smart specialisation (S3) is an example of fruitful interaction between science and policy. The concept was first developed in the context of the high-level expert group on 'Knowledge for Growth' created by the European Commission. It was recast through work by researchers both within and outside the Commission to foster regional economic transformation and incorporated as a key principle of investment in research and innovation in the framework of the EU regional policy.

Through its adoption and adaptation towards regional development, the smart specialisation concept has become a powerful instrument for place-based innovation-driven growth. Furthermore, evidence arising from regions and ongoing informal policy discussions signals that the smart specialisation approach may be evolving towards a methodology that goes beyond its application to the EU regional policy. In fact, smart specialisation is gaining interest in both scientific and policy-making communities linked for instance to urban and local development, and is also bridging the gap towards more thematic policy approaches such as industrial and energy policies.

Conceived within the reformed Cohesion policy of the European Commission, the S3 approach is characterised by the identification of strategic areas for intervention based both on the analysis of the strengths and potential of the economy and on an Entrepreneurial Discovery Process (EDP) with wide stakeholder involvement. It embraces a broad view of innovation supported by effective monitoring mechanisms.

The European Commission, in particular DG REGIO and the S3 Platform at DG JRC, have been putting a great effort in developing the S3 approach, making it operational, helping the regions and countries to understand it and develop their strategy and policy design. A first milestone in this process was the publication in May 2012 of the "Guide on Research and Innovation Strategies for Smart Specialisation", containing basic definitions and the principles to be followed for the design of sound smart specialisation strategies. Now the attention turns to implementing these strategies.

The work on the present material — "Implementing Smart Specialisation Strategies: A Handbook" — has followed three compasses:

- Being pragmatic, building on policy-makers' needs and on field evidence;
- Being useful, meaning a relevant supporting tool which is worth reading;
- And being practical, meaning providing hands-on suggestions that are immediately applicable.

Selecting the topics for specific policy advice

Some key issues/challenges have been identified according to two criteria, matching a top-down and a bottom-up approach:

- What is seen as most relevant from the perspective of S3 as a policy area, that is what is a defining element of the S3 approach and the EU Structural Funds regulations that constitute the main funding source of smart specialisation strategies — this reflects the top-down component.
- Areas that are often most challenging for policy implementation, where more behavioural and procedural changes, as well as adaptation are asked of policy-makers, and more effective supervision of processes, funding flows and results is needed — this reflects the bottom-up component.

The handbook is divided in the following chapters:

1. **The Entrepreneurial Discovery Process cycle: from priority selection to strategy implementation.** The chapter aims at taking stock of the lessons learnt about the EDP so far. What are the conditions for an effective and efficient discovery process? How can we make the process sustainable in time and how to use it to narrow down broad priorities?
2. **Good Governance: principles and challenges**
   This chapter explores the governance arrangements needed to ensure that a wide variety of stakeholders participates in the strategies, in particular the business community, and ways to avoid the process being captured/hijacked by interest groups.
3. **From Priorities to Projects: selection criteria and selection process**
   Priorities are especially important in smart specialisation strategies, but the other side of the coin is far from trivial: defining projects and calls within priorities areas in a way that allows to best realize the innovation potential of those areas.
4. **Transnational cooperation and value chains**
   This chapter reviews experience acquired with regard to the European value-chain approach and EU macro-regions and provides a selected number of examples.
5. **Monitoring**
   The chapter draws on experience accumulated so far and clarifies the role of monitoring, the type of monitoring activities and indicators to be used in S3, and provides indicative initiatives developed in various regions.

Note: the acronym S3 may refer in the text to either 'Smart Specialisation' or 'Smart Specialisation Strategy' depending on the context. The term 'Smart Specialisation Strategy' (S3) is also used as a synonym of 'Research and Innovation Strategy for Smart Specialisation' (RIS3).

List of acronyms

- S3: Use for both 'Smart Specialisation' and 'Smart Specialisation Strategies'
- EDP: Entrepreneurial Discovery Process
- ESIF: European Structural and Investment Funds
- ERDF: European Regional Development Funds
- EARDF: European Agricultural Fund for Rural Development
- CF: Cohesion Fund
- ESF: European Social Fund
- YEI: Youth Employment Initiative
- EU: European Union
- DG REGIO: European Commission's Directorate-General for Regional and Urban Policy
- DG AGRI: European Commission's Directorate-General for Agriculture and Rural Development
- JRC: European Commission's Joint Research Centre
- OP: Operational Programme
- R&D: Research and Development
- R&I: Research and Innovation
- RTDI: Research, Technology, Development and Innovation
- GVC: Global Value Chains
- IPR: Intellectual Property Rights
- RDA: Regional Development Agency
- NGO: Non-Governmental Organisation
- SME: Small and Medium Enterprise
- IPL: Innovation Policy Labs
- ICT: Information and Communication Technologies
- HEI: Higher Education Institution
- RTO: Research and Technology Organisation
- KET: Key Enabling Technologies
- GDP: Gross Domestic Product
- EIT: European Institute of Innovation and Technology
- KIC: Knowledge and Innovation Communities

Chapter I

The Entrepreneurial Discovery Process (EDP) cycle: from priority selection to strategy implementation

Contributors

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Highlights

- The logic of the EDP — whereby stakholders' interaction is used to open new domains of technological and market opportunities, as well as to inform governments' policy and decision-making processes — has proved robust since its introduction.
- Moreover, the EDP concept has since evolved to embrace a wide array of inclusive public-private processes that, whilst underpinning structural funds deployment, also stimulate the use and/or combination of EU, national, regional, public and private funding sources.

Policy relevance

The EDP requires governments to provide a dedicated management and to act as platforms to enable, sustain and guide stakeholders' participation across the policy-making process. This brings new opportunities as well as important challenges for the public sector. Despite being a traditionally risk adverse stakeholder, the public sector now needs to invest in strategic priority areas, where the returns — in terms of public and private concentration of RTDI investments and their social and economic impact — may only be visible in the long term.

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Introduction

EDP: an intact logic for an evolved concept

The term Entrepreneurial Discovery Process (EDP) is about prioritising investment based on an inclusive and evidence-based process driven by stakeholders' engagement and attention to market dynamics. The EDP is the motor of the S3 methodology.

As a process through which regions or countries reveal where they see they can do best in terms of R&D and innovation, the EDP distinguishes the S3 from older policy approaches[1].

Hence, the EDP provision breaks with traditional policy intervention based on centralised, top-down decision processes[2] on the grounds that the knowledge needed to regulate certain activities is scattered across stakeholders. Since its inception, the logic of EDP, whereby stakeholders' interaction is used to open new techno-economic opportunities and to inform governments' decision-making, has reasserted in its two key dimensions:

- As a crucial and initial step for firms and research actors to open and explore new niches and market potential, as well as domains of scientific and technological opportunities;
- As a mechanism/process generating information on the value of such new domains, thereby supporting policy-makers in their investment and policy decisions for regional development.

Also based on experience with EDP, the introduction present some of the key features of EDP pointed out by leading scholars and policy-makers in the field. It also refers to the new dimensions of EDP that were not fully acknowledged nor addressed at earlier stages. In the second part of the chapter, we review and address these new dimensions of EDP. Key examples are provided throughout the chapter.

Understanding the EDP in practice

Following this inclusive approach and in line with the S3 guidelines, regions across Europe have adopted different kinds of participatory models and evidence-based practices to identify potential domains of specialisation. This useful endeavour, in which the EDP is used as a 'stock-taking process' allows mapping promising sectors for investment and domains for future competitiveness.

The EDP is considered a, — if not the — feature that distinguishes the smart specialisation approach from innovation strategies of the past and the one that lends these approaches their more 'bottom-up' character. (Rodríguez-Pose & Wilkie 2016).

Based on the assessment of S3, the most recurrent participatory models and analytical tools used for EDP include:

- Participatory models: Working or focus groups, partnerships and public-private committees, websites tailored for citizen participation and consultation, as well as methodologies based on action research approaches;
- Evidence-based practices: SWOT analysis, studies on scientific, technological and economic trends, competence and actors mappings, stakeholders' surveys.

New dimensions of EDP

Moreover, practice has also stressed that the EDP, as a process initially conceived for choosing investments priorities under Thematic Objective 1 of the ERDF (strengthening research, technological development and innovation), has evolved revealing new dimensions that were neither fully acknowledged, nor addressed at earlier stages, namely:

- The cyclical nature of the EDP;
- The new role of government;
- The need to adapt EDP to contextual factors;
- The local, regional, national or transnational structures for EDP.

The rest of this chapter reviews and addresses these new dimensions, providing key examples that have emerged from the activities of the S3 Platform and from discussions with public authorities involved in S3 management and implementation.

Table I.1 underlines some of the key features of EDP — pointed out by leading scholars in the field and policy-makers in charge of the elaboration or implementation of the S3.

Table I.1. What Entrepreneurial Discovery Processes (EDPs) are/are not

Source: Authors' elaboration based on Foray (2015), Coffano, M., and Foray, D. (2014), Capello (2014), Rodríguez-Pose (2013), Pia Fabrin (2015).

	YES	NO
PROCESS	EDPs are: • Inclusive and interactive processes in which market forces and the private sector, together with other stakeholders in the quadruple helix discover and produce information about new activities; • Drivers of S3, as they underpin the development of innovative ideas in a specialised area; • Processes that should be integrated in every part of the policy cycle; • Placing 'entrepreneurial knowledge' at the centre of innovation-based development.	EDPs are not: • Isolated or ad hoc processes; • An element of basic research; • A type of market-research; • A purely administrative step towards obtaining ERDF funding ; • A set of rigid rules directly applicable across regions.
KNOWLEDGE GENERATION	Entrepreneurial knowledge combines knowledge about science, technology and engineering with knowledge of market growth potential, industry competitors, business environment, societal and economic needs, as well as the whole set of inputs and services required for launching a new activity.	EDPs do not generate scientific or technological knowledge.
ACTORS	EDPs pursue the integration of entrepreneurial knowledge fragmented and distributed over many sites and organisations, companies, universities, clients and users, specialised suppliers (some of these entities being located outside of the region) through the building of connections and partnerships among actors.	EDPs are not processes in which a closed number of actors exclusively can interact.
PURPOSE	EDPs: • Allow governments to better know their territory and hence empower local actors in reaching the strategic objectives of the region; • Consist of the exploration and opening-up of a new domain of opportunities (technological and market), promising in terms of innovation; • May require "killing darlings".	Entrepreneurial discovery has to be distinguished from entrepreneurial innovation. The term 'innovation' and 'discovery' should not be considered synonyms. The former refers to the actual creation of a new marketable product/service/process, the latter is broader and refers to the results of a joint exploration of techno-economic opportunities.
EXPECTED CHANGES	EDPs are expected to contribute to regional economic transformation, as the decisive link that allows the system to reorient and renew itself.	EDPs are not a static process, to keep the cycle of local development unchanged.

The following example illustrates how the French regions Centre-Val de Loire and Franche-Comté as well as the Portuguese region Norte have developed different ways/methodologies to use EDP as a prioritisation mechanism and how this practice has led to the identification of their regional investment priorities.

Learning from practice

Centre-Loire Valley, Franche-Comté (FR) and Norte (PT)

EDP as a prioritisation mechanism

In the region **Centre-Loire Valley (FR)**, the main purpose was/is to use a change management strategy not only for S3 design but also to facilitate the implementation phase.

To this end, the followed methodology included these five steps:

- Anticipating resistances: mapping all actors and predicting their reaction due to the changes implied by the new strategy;
- Defining who will be the 'change leader' who will have to liaise with stakeholders;
- Preparing the story telling: the Managing Authority starts by highlighting what are the benefits of the new strategy for each stakeholder;
- Adopting and explaining the methodology to select and implement S3 priorities. In particular, it is very useful to appoint coordinators for each priority (if possible both from economic and academic worlds). The support of the S3 Platform has been critical for this step, increasing the legitimacy of the methodology;
- Assessing and communicating the added value provided by the changes and the commitment of the stakeholders.

The **Franche-Comté (FR)** region has identified its S3 priority areas through a process combining numerous interactions between the regional government and the industry, with statistical analysis on the regional economy. These S3 priorities include microsystems and micro-techniques for the luxury industries. Subsequently, the regional Government has been strongly committed in stimulating and supporting, with investment, new collaborative projects within these priority areas.

In the region **Norte (PT)**, a micro-system of innovation, developing flexible automation in the footwear industry has emerged following the combination and integration of engineering knowledge from the University of Porto (INESC), skills of companies specialised in industrial machinery, tools and software, as well as the entrepreneurial vision of a few footwear manufacturing firms which understand very well the need for revival via innovation. In this context, public actions pursuing the EDP will be particularly effective as they rely on an already active and committed micro-system of innovation.

More information

Centre-Loire Valley — Agence Régionale Innovation et Transfert de Technologie (ARITT) webpage (French):
http://www.arittcentre.fr/s3/
Franche-Comté — ERDF-ESF 2014-2020 Operational Programme webpage (French):
http://www.europe-en-franche-comte.eu/FEDER/FED-ER-2014-2020
Norte — Portuguese Innovation Agency website, see the communication "Portuguese footwear industry improved its competitiveness through R&D and RIS3" (Portuguese and English):
http://www.adi.pt

The cycle of EDP

Discovering what a country or a region may be good at requires an investment in a concrete process of exploration[3]. However, the experience accumulated over the past years has shown that this is only the initial step of EDP. In other words, the EDP in practice goes beyond the prioritisation phase and the subsequent related investments.

The potential of EDP: Recursive stakeholders' involvement

The EDP provision calls for an inclusive and interactive process at the different stages of the policy-making process. To successfully implement S3 priorities, it is not sufficient for public authorities and stakeholders to jointly identify investment priorities.

It is critical to ensure continuity to the EDP. Discontinuing the EDP means disrupting a trust-building process that is crucial for the sustainability of the S3 itself.

Rather, once the process of 'discovery' has been initiated, it is crucial to keep engaging stakeholders throughout the different stages of the policy-making process (see Figure I.1)[4]. This new dimension, which could be referred to as a continuous process, is necessary to ensure trust and commitment to the strategic objectives codified in the S3s, and hence the successful implementation of the strategy itself.

Nonetheless, although public-private interaction is not an unknown practice across regions, the challenge is to maintain the dynamics generated during the elaboration of the national and/or regional S3 along the different stages of the policy cycle.

To achieve this, it is important to map and sustain dialogue among all institutional actors involved in S3 design and implementation. This task includes dialogue with the teams/institutions that conducted the EDP exercise in view of the ERDF ex-ante conditionality, as well as actors involved in the management/implementation of the relevant Operational Programmes (OPs) or other funds, down to the very individuals involved in drafting and managing calls for proposals.

All these actors should have a common understanding of the EDP and should be aware of their role within the entire process. Based on the experience accumulated in regions:

- The involvement/consultation of stakeholders in the definition of policy instruments appears crucial, as it allows policy-makers to identify potential bottlenecks hence foreseeing implementation problems;
- The interaction among stakeholders involved in the monitoring of the strategy allows a continuous reflection on market opportunities, as well as a periodic re-assessment of the investment priorities previously identified.

The next example on Slovenia and Wielkopolska (PL) illustrates how the EDP is effectively permeating different stages of the policy-making cycle. In these cases, involving stakeholders has ensured actors' trust and commitment towards the objectives pursued in their S3, aligning market needs and opportunities with policy.

In sum, the EDP requires a long-term investment in building both mechanisms to prevent the cycle being broken by either political or financial instability, and aspects of the functioning of the public administration (see chapter II "Good governance: principles and challenges").

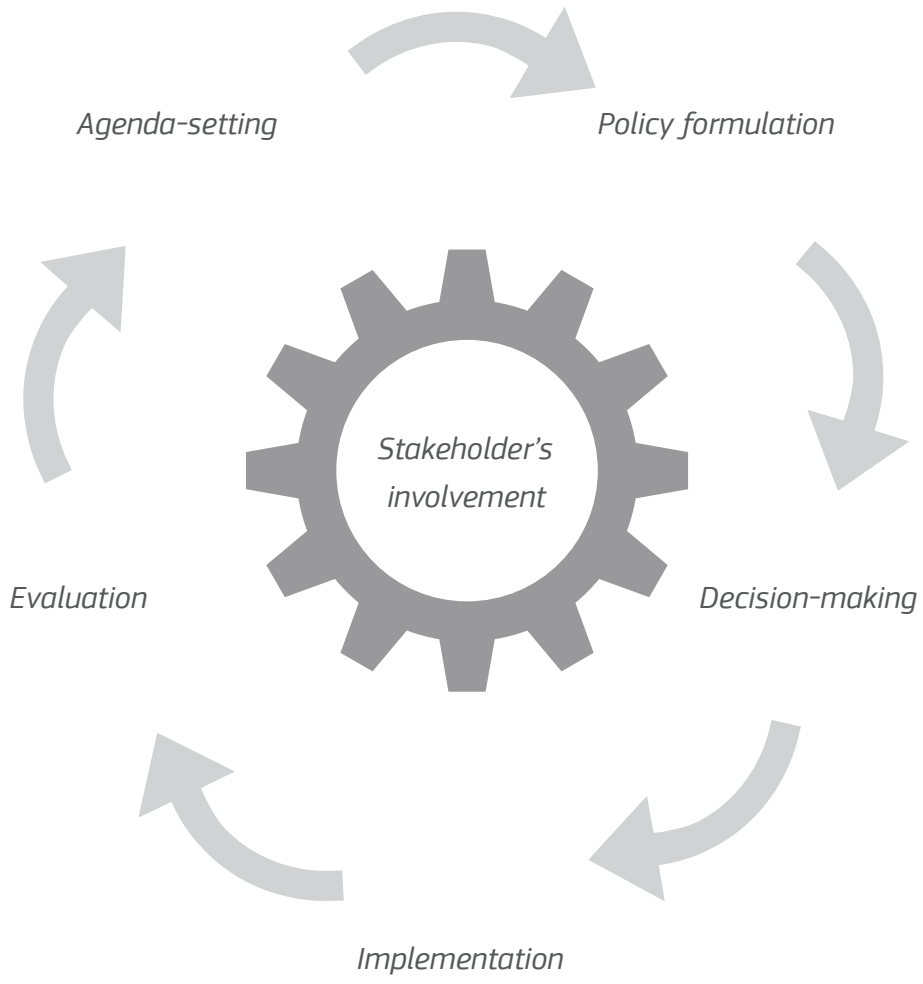

Figure I.1 The Cycle of EDP
Source: Kyriakou and Periañez-Forte (2016), based on Lasswell (1956).

Ensuring the continuity of EDP beyond the prioritisation phase

Learning from practice

Slovenia and Wielkopolska (PL)

Slovenia: open partnerships for private and public actors

As a result of the EDP stock-taking exercise that took place in Slovenia, a number of partnerships are established to support S3 implementation. These partnerships are planned to be open entities, where representatives from business, research, academia, NGOs, public sector may join or leave the group at their own initiative. However, partners will be required to provide their own funding as a way to guarantee engagement and cooperation. The internal management structure of the partnerships is tailored according to the technology and market-specific characteristics of each S3 domain, with some

transversal partnerships covering more than one domain. Partnerships have the objective, among others, to maintain open dialogue throughout the policy cycle (implementing the EDP as a continuous process). This *modus operandi* was approved by all stakeholders, as it appeared clear that the process of identifying and focusing on investment priorities should be a continuous living and changing one.

During the preparation of S3 a substantial shift occurred: a change in the perception and the mind-set of key actors, including businesses and researchers. After many networking events, promotional activities and consultations, stakeholders no longer looked at the process from afar but are now taking ownership of it and co-creating trends and policies.

Wielkopolska (PL): platforms for stakeholders' engagement

Following the adoption of the S3 by the Regional Parliament (March 2015), the S3 Forum is in charge of animating stakeholders' dialogue and interaction. It comprises six Working Groups, each being responsible for a domain of specialisation. In this way, the EDP is connected with the institutional process being carried out by the Interdepartmental S3 Team and the Wielkopolska Innovation Observatory at the Marshal Office of Wielkopolska. The Forum members (92 participants, of which 56 companies) are expected to have an impact on both S3 implementation and the regional OP. The Office has gained valuable partners which are able to formulate enterprises' needs, hence facilitating the establishment of effective innovation policies. The Forum Working Groups (182 participants) appear to be strongly involved in the process. This kind of cooperation enables and encourages linkages between businesses and science partners.

More information

Slovenia's webpage (Slovenian):
http://tinyurl.com/guvo3el
Wielkopolska in "Smart Stories", European Commission (2016)
http://s3platform.jrc.ec.europa.eu/smart-stories

The new role of government

The inclusive governance and evidence-based policy, required for the EDP, demands that the public sector acts as a platform to enable targeted stakeholders' interaction and policy coordination. This should sustain and guide stakeholders' participation across the entire policy cycle. Here, the government operates as a service provider enabling its user community[5]. As such, the EDP brings new opportunities to policy-makers, as well as important challenges. These new demands on governments put an emphasis on the role of communication and transparency, both within the public administration and towards stakeholders, in order to ensure the sustainability of the process. Whilst it is critical to establish effective and efficient channels for communication from the onset of the process, it is also imperative to ensure flexible structures where governments and stakeholders can constantly adapt activities and policies to a changing reality. In this regard, governments have the following key responsibilities:

Inclusive governance facilitates that policy decisions are not specified beforehand, but evolve through exchanges between government, entrepreneurs and its citizens.

- To stimulate through incentives a continuous dialogue across firms and other stakeholders, allowing new techno-economic domains to emerge and be discussed;
- To avoid that inertia and path-dependence lead to selecting already established sector or areas that are too broad to become actionable;
- To build on such dialogue to recursively assess and select investment priorities identified by stakeholders;
- To support selected priorities by developing policy instruments that enable collaborative projects and that embed monitoring and evaluation activities.

The above responsibilities are often new to policy-makers across governmental levels. The way that public authorities deal with these tasks has a direct effect on the way in which the EDP can be organised, raising questions related to responsibilities, capacities, management of stakeholders, the impact of political changes and the ability of the public sector to engage in activities that present risks. Based on the experience accumulated in regions, we mention in the following sections some key issues affecting the success of EDP and illustrate with examples how these issues have been addressed in some regions.

In the EDP, bottom-up, public-private interactions, evidence-based analysis and exchanges of entrepreneurial knowledge are the principal sources of information for policy-makers to develop more efficient tools for regional development.

Leadership of the EDP

The EDP requires a 'collaborative leadership' dynamic to be in place for regional stakeholders to find their way to work together. It is equally important to mobilise stakeholders and allow new ideas to emerge, as to translate

such ideas into strategic steps that can have an impact on a whole cluster or domain[6]. Within this process, each stakeholder has a role to play and it is a collective responsibility to build and sustain trust.

As for the public sector, one of its roles is to provide adequate platforms for this collaborative work to happen. The role of these platforms is essential to ensure balance across competing interests and keep in check lobbying and corruption.

Learning from practice

Andalusia (ES)

Launching a collaborative leadership dynamic

In **Andalusia (ES)**, the EDP itself generated a 'collaborative leadership' dynamic in which entrepreneurs, companies, knowledge actors and the regional Government have worked together, complementing each other by opening up the strategy to all citizens of the region. A distinctive feature characterises the EDP: the design of a participatory and joint decision-making process.

The challenge addressed by the Regional Government of Andalusia was to create a collaborative process to ensure the engagement of the regional stakeholders in the EDP to jointly design the S3. To achieve this, the regional Government understood innovation actors in a broad sense, including large and small companies, independent innovators, technology and competence centres, universities and public agencies, science and business parks, etc.

For this difficult task, the region invited to the process those regional companies that had demonstrated a commitment to innovate, that is, companies that were investing on innovation projects or introducing new products/services into the market. Likewise, individual innovators were also taken into account and were selected among those actors, assuming the risk of exploring new business opportunities in the region, such as start-ups/spin-offs. Those stakeholders were considered to be the best placed in Andalusia to know or/and discover which are the region's most promising areas for specialisation and, above

all, to be the real performers of the exploitation of these areas in the future.

Different ways of forming and managing panels were put in place. The objective was to ensure the engagement of a large number of stakeholders, as well as a fair number of initial ideas/areas pointing out the innovation opportunities existing in the region. According to the staff in charge of the organisation of the EDP, what was expected from the actors involved was commitment, cooperation, learning capacity and progress.

More information
Periañez-Forte et al. (2016)

Skills or capacities necessary to transform 'entrepreneurial knowledge' into policy intervention

Mediating between entrepreneurial, uncodified knowledge and policy definitions in a way consistent with the EDP, may require skills/capacities that are new to public bodies.

These skills/capacities include the existence of an appropriate infrastructure for identification of, and exchange among stakeholders (i.e. updated datasets, platforms for interaction, etc.). At the same time, stakeholders' engagement requires awareness and practice of participatory leadership methodologies, which allow common decision-making to emerge.

As for the public sector, one of its responsibilities is to ensure the 'soft skills' needed to be built for a successful EDP. Likewise, participatory leadership must be combined with, and aligned to the technical, legal and administrative knowledge which is well developed in the public sector. In this respect, one cannot understate the importance of an interdisciplinary mindset, whereby public entities that are relevant in different parts of the policy cycle have a common objective and vocabulary.

As an example, it is critical that those in charge of writing calls or selecting and monitoring projects are fully aware of the previous interactive process with stakeholders. In this way, they will be able to address stakeholders' needs by devising appropriate policy instruments.

Learning from practice

Eastern Macedonia and Thrace (GR)

From 'entrepreneurial knowledge' to policy intervention

In **Eastern Macedonia and Thrace (GR)**, the EDP required not only introducing, for the first time, participatory dialogue in the RTDI policy-making, but also reigniting trust-building towards the public sector. This mechanism required that stakeholders who took part in the EDP be kept informed about policy outcomes. This was made possible through two types of events:

- EDP focus groups: a set of four sectoral events, aimed at generating innovative ideas through interaction between business, public and research sectors within the S3 priorities;
- Project Development Labs (PDL): a set of two events aimed at processing the EDP ideas and moving them towards implementation, identifying funding opportunities and action plans for policy. During the second PDL in particular, policy-makers presented to actors of the triple helix the draft calls for proposals, which were developed in light of the EDP focus groups. Stakeholders could comment on those, as well as develop their ideas further with the support of experts in R&D funds.

With the S3 experience, policy-makers in this region were given responsibilities for research and innovation policies. These new competences pushed the Managing Authority of the ERDF OP to develop, together with the Joint Research Centre (JRC), skills in participatory leadership to pursue EDP in different sectors. Through the EDP focus groups, the region defined in detail its priority areas and building on that, analysed the administrative and legal aspects necessary to write effective calls for proposals. This involved interactions with the national government, the European Commission and experts in the field. Furthermore, throughout this process, stakeholders themselves noted that a better awareness of relevant actors (through updated databases and appropriate avenues for interaction) was necessary for conducting a proper EDP.

More information

Boden et al. (2016)

Preserving EDP from political changes or political instability

The EDP requires trust across stakeholders, which is a lengthy and laborious process that should be protected from sudden political instability.

As for the public sector, the governance system should devise ways to ensure that the outcomes of stakeholders' interaction are embedded in the policy process in a robust way, whereby political changes — rather than damaging the trust building process — are in a position to embrace them in their new agenda. (See chapter II: "Good governance: principles and challenges").

Learning from practice

Navarre (ES)

EDP withstanding political changes or instability

In the case of **Navarre (ES)**, following the elections of 2015, the party that had governed the region since 1996, did not have its mandate renewed. Previously, the S3 had been embedded in the so-called "Moderna Plan" and implemented through the Moderna Foundation. With the new government, the implanting foundation was closed, yet the S3, the "Moderna Plan" and its corresponding projects were kept and moved under the management of SODENA, the regional development agency.

More information

Navarre region's webpage (Spanish):
http://tinyurl.com/hav3vc3

Embedding the risk-friendly behaviour needed for innovation in traditionally risk-adverse public institutions

The EDP requires the public sector to adopt a more risk-accepting attitude. Selecting priorities with the aim to develop new strategic sectors bares risks, as returns are uncertain and will only be visible in the long-term.

As for the public sector, the government also has the responsibility to re-assess the priorities periodically, which may require shifting the investment to other sectors if the avenues previously pursued appear less promising than expected.

The key question is how to use the existing structures in a region to go beyond what is already in place.

Policy-makers need to identify new ways of working, in which uncertainty and risks in strategic proposals can be duly evaluated without any detriment to public accountability. It requires the public sector to take new risks, avoiding path-dependence or inertia, which would result in either picking winners or defining broad priority areas.

All in all, public sector innovation appears as a critical component of the EDP, without it, the State and its public sector agencies are more likely to frustrate rather than foster the EDP[7]. These challenges are especially relevant in those cases in which S3 has altered the distribution of competences related to RTDI policies.

The need to adapt EDP to contextual factors

The afore-mentioned challenges need to be addressed starting from the contextual factors. At the core of the S3 concept lays the conviction that development paths are place-based, which is why one EDP size does not fit all. A place-based approach is about extracting and building on local knowledge with the aim to mobilise it nationally and internationally[8], taking into account local specificities and constraints.

This place-based approach also applies to the EDP itself. Although any EDP approach shares the goals of facilitating stakeholder's interaction, integrating their perspectives and actions into common goals and shared priorities, and obtaining their commitment to coordinated implementation, the way in which such objectives are pursued differs across regions.

Based on the experience accumulated in regions, we have identified three elements that illustrate well the place-based nature of EDP. Although these elements are not the only ones affecting EDP developments, they serve the purpose of highlighting how much variety can exist across different territorial realities in the EU.

Degree of use of participatory practices and trust among stakeholders

The way the EDP is organised, as well as its outcome and impact, depends on how participatory decision-making processes, stakeholders' dialogues, and consequently trust among stakeholders are established in regions.

As for the public sector, in regions with less tradition in participatory exchanges and less trust among stakeholders, the EDP — whilst posing

significant demands in terms of time, effort and commitment — has been a useful encouragement to stakeholders' interaction. Hence, the government should find ways to be responsive and devise feedback mechanisms to ensure that the actors involved in the EDP know how their participation is affecting policy decisions, thereby avoiding stakeholders' fatigue.

On the other hand, in countries and regions with longer standing tradition in participatory exchanges, the EDP has provided momentum to reinforce and expand such practices

Learning from practice

Flanders (BE), Poland and the Czech Republic

Promoting participatory practices and trust among stakeholders

In **Flanders (BE)**, a region traditionally more exposed to public-private interaction, the S3 process has served the purpose of enhancing and expanding pre-existing stakeholders' engagement practices at international level. The Strategic Policy Framework for Smart Specialisation in Flanders explicitly refers to "The smart specialisation strategy emerges as the 'international proofing' of an innovation driven economic transformation of the Flanders' economy. Investments in innovation are more effective if they fit in innovation eco-systems (so-called triple and quadruple helix systems) supporting entrepreneurial opportunities in a globalised knowledge-driven economy".

In countries such as Poland and the Czech Republic, where regions are still building competences in the RTDI field, there have been parallel national and regional EDPs. These efforts led to widening stakeholders' participation at both levels, going beyond consultation towards more interactive forms of discussion and decision-making processes and raising the challenge of harmonising the different outputs.

More information

For the case of Flanders, see "The Strategic Policy Framework for Smart Specialisation in Flanders":
www.vlaio.be/downloadfile/fid/33427
For the case of Poland and Czech Republic, see Mieszkowski (2016)

Institutional setting

A successful EDP requires governance structures sufficiently flexible to engage and empower stakeholders in the decision-making processes. Such flexibility is pursued differently depending on the institutional setting. As for the public sector, in regions with a high regional autonomy dealing with RTDI policy, it is possible to institutionalise new EDP practices. In other cases, the EDP results from new configurations between the national and regional level.

The relationship between EDP and the institutional context within which it occurs is of tremendous relevance to innovation, growth and economic performance in general[9].

Entrepreneurial readiness of the actors

Having entrepreneurial stakeholders which are ready to take an active role in the EDP seems critical for the success of the process. Entrepreneurial actors are intended in a broad sense as stakeholders that are able to identify and pursue new opportunities. As such, they are not limited to firms in the private sector. Entrepreneurial knowledge arises from different sources[10] and combining this know-how is crucial to develop a comprehensive knowledge-base to inform policy decisions[11].

As for the public sector, when potential activities of future specialisation are detected, different stakeholders may contribute to identifying existing capabilities (e.g. research capabilities) but also barriers (e.g. regulatory constraints or institutional problems) to allow these activities to flourish further[12].

It follows that one important element for the EDP success concerns the entrepreneurial readiness of the actors and their capacity to catalyse the attention and effort of their peers so that agglomeration and scale effects materialise at a later stage[13].

Learning from practice

Catalonia (ES)

Fostering actors' entrepreneurial readiness

In **Catalonia (ES)**, the University of Girona set up the so called "Campus Sectorials". These are independent entities aimed at increasing the social and economic impact of the university by acting as bridges between the academy, the local productive

sector, the institutions and society. The "Campus Sectorials" act as business-led knowledge brokers between researchers and the local private sector, launching an initial embodiment of EDP and preparing participation in it. Indeed, they have been critically engaged throughout the whole cycle.

More information
Marinelli et al. (2016)

The local, regional, national or transnational structures for EDP

The EDP approach has triggered new institutional arrangements beyond the regional scale. Such structures are based on the awareness that 'bottom-up approaches', which mobilise stakeholders in the pursuit of innovation and which requires multiple points of view to combine technology with market opportunities, have the potential to add value at different levels.

There are examples of institutional arrangements that have emerged at sub-regional and transnational level to foster collaboration among Member States, regions and community members to ensure the optimal and effective uptake of EU Structural Funds. These examples stress that identifying innovation opportunities is in itself an interdisciplinary task which requires multiple points of view to combine technology with market opportunities at local, regional or transnational levels.

Structures that have emerged to support EDP above and below the regional scale

Learning from practice

Extremadura (ES)

Local or sub-regional structures for EDP

In the territory of Tajo-Salor-Almonte, region of **Extremadura (ES)**, the Local Action Group of Rural Development created its own sub-regional EDP. This way, capitalising on key features of the S3 approach — such as competitive advantages, common vision, stakeholder' involvement — and building on the

experience of the LEADER programme, the territory identified its local comparative advantage in the exclusively local cheese "La torta del Casar". The rural EDP allowed local actors (e.g. farmers and knowledge institutions) to address jointly the weaknesses of their production system, e.g. the lack of capacity to attend market demand during peak seasons. On the one hand, the implementation of sub-regional, local EDPs and S3s illustrates the recognition of the process potential by local actors and policy-makers. On the other hand, the EDP logic generated the challenge for different public administrations to coordinate initiatives and policies at regional and local level.

EU level thematic structures enabling EDP

At EU level, the European Commission has organised thematic platforms on Energy, Industrial Modernisation and Agri-Food to enable the EDP at European level. These platforms pursue to focus innovation efforts of regions and scaling up innovation projects that have the potential to be a business driver across regions. The aim is to incentivise territorial collaboration among regional and national authorities, regional clusters and representatives and jointly promote investments and innovation and develop positions in new Global Value Chains (GVCs) on key areas of S3.

More information

See the EDP section of the TAGUS project webpage (Spanish):
http://www.tagus.net/ecosistema/
S3 Thematic Platforms on Agri-Food, Energy, Industrial Modernisation (English):
http://s3platform.jrc.ec.europa.eu/agri-food
http://s3platform.jrc.ec.europa.eu/s3p-energy
http://s3platform.jrc.ec.europa.eu/industrial-modernisation

Summing up and challenges ahead

- The inclusive governance required for the EDP demands from governments to act as platforms to enable targeted stakeholders' interaction and policy coordination. This is essential to ensure balance across competing interests and keep in check lobbying; it should also prevent capturing/hijacking of the EDP by incumbent firms/actors, while allowing space for the interests of incipient, to-be-launched firms to be given a voice.
- This inclusive governance requires governments to provide a service enabling its user community, where policy decisions are not specified beforehand, but evolve through exchanges between government, entrepreneurs, researchers, and civil society, i.e. the quadruple helix.
- It is not sufficient for public authorities and stakeholders to jointly identify investment priorities. To guarantee EDP as an ongoing process and successfully implement the S3 strategy, governments should ensure:

  - Trust and commitment to the strategic objectives codified in S3 strategies;

  - Flexible structures and incentives where governments and stakeholders can constantly interact and adapt activities and policies to a changing reality;

  - Stakeholders' engagement throughout the different stages of the policy-making process, for instance, in the definition of policy instruments or during the monitoring of the strategy to allow a continuous reflection on market opportunities, as well as a periodic re-assessment of the investment-priorities previously identified.
- EDP is also triggering new institutional arrangements, beyond the regional scale, where governments and stakeholders can interact to identify innovation-opportunities. Such structures are based on the awareness that 'bottom-up approaches', which mobilise stakeholders in the pursuit of innovation, have the potential to add value at different levels.

Notes

[1] Coffano and Foray (2014); Rodríguez-Pose and Wilkie (2016).

[2] Foray (2016).

[3] Hausmann and Rodrik (2003).

[4] The involvement of stakeholders in policy-making, coupled with the emphasis on evidence-based decision-making are increasingly common across countries. They undertake these practices in the interest of higher transparency and with the aim to address societal needs efficiently (Mieszkowski and Kardas, 2015).

[5] O'Reilly (2010).

[6] OECD (2013).

[7] Morgan (2016).

[8] McCann and Ortega-Argilés (2015).

[9] Rodríguez-Pose (2013); Rodríguez-Pose and Wilkie (2016).

[10] Coffano and Foray (2014).

[11] Rodríguez-Pose and Wilkie (2016).

[12] OECD (2013).

[13] Foray (2012).

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Chapter II

Good Governance: principles and challenges

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Highlights

This chapter proposes seven principles of good governance to guide the implementation of S3. It spells out some of the difficult challenges and makes practical suggestions for national and regional authorities to follow. Examples from across Europe are included which can be useful for policy learning; although specific regional contexts require tailor-made governance structures.

Policy relevance

As governance arrangements underpin most aspects of S3, it is important that implementing authorities reflect on the principles of good governance and how they can be applied in their countries and regions.

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Introduction

Governance arrangements can foster or frustrate the implementation of S3, which is why national and regional authorities should reflect and strive to integrate principles of good governance. In fact, many aspects of implementation covered in this handbook are highly influenced by governance arrangements, in particular:

1. The selection of projects for public funding;
2. A continuous Entrepreneurial Discovery Process (EDP);
3. Monitoring mechanisms.

What exactly do we mean by governance in the context of smart specialisation? We use the term to describe how the whole process of designing and implementing S3 is governed, including who is involved, the structures that are put in place and how decisions are taken. Using the term governance recognises that effective strategies are not implemented exclusively by national or regional authorities, rather executive power is shared with innovation actors, networks and indeed civil society more widely. As this Handbook is directed mainly towards national and regional authorities, this chapter focuses on the role of the public sector in establishing, steering and overseeing governance of S3. Institutional change in the private sector, universities and other innovation actors can also be crucial. At the same time, the role of the public sector in driving forward S3 should not be underestimated, and can be particularly important in some less well-off regions with fewer innovation actors. Moreover, some aspects of governance can only be exercised by government (such as public funding decisions), and the main challenge in smart specialisation is to follow a process that involves a wide variety of actors while retaining democratic control.

Good governance underpins the successful implementation of a Smart Specialisation Strategy — indeed, it is present in all the other themes tackled in this handbook.

This chapter starts by explaining in depth the critical importance of governance to smart specialisation with an overview of the concept's main elements. The rest of the chapter discusses the following seven principles of good governance, which are based on experiences from the S3 Platform:

1. Leadership and participation to enable innovation;
2. Cohesion to implement a collective vision;
3. Independence and transparency;
4. Integrated implementation;
5. Embedding smart specialisation in regional policy-making;
6. The importance of multi-level governance;
7. Reflection and learning.

Practical examples from different regions and countries across Europe are used to illustrate these principles. However, we should also recognise that each governance setting is unique and therefore there is no such thing as a 'governance template' that can be universally applied to every regional context, regardless of the circumstances of time and place. Respecting the uniqueness of local context does not mean that we have to abandon the search for general principles; on the contrary, it means that we have to apply these principles in a manner that is attuned to and appropriate for the place-specific character of the region in question.

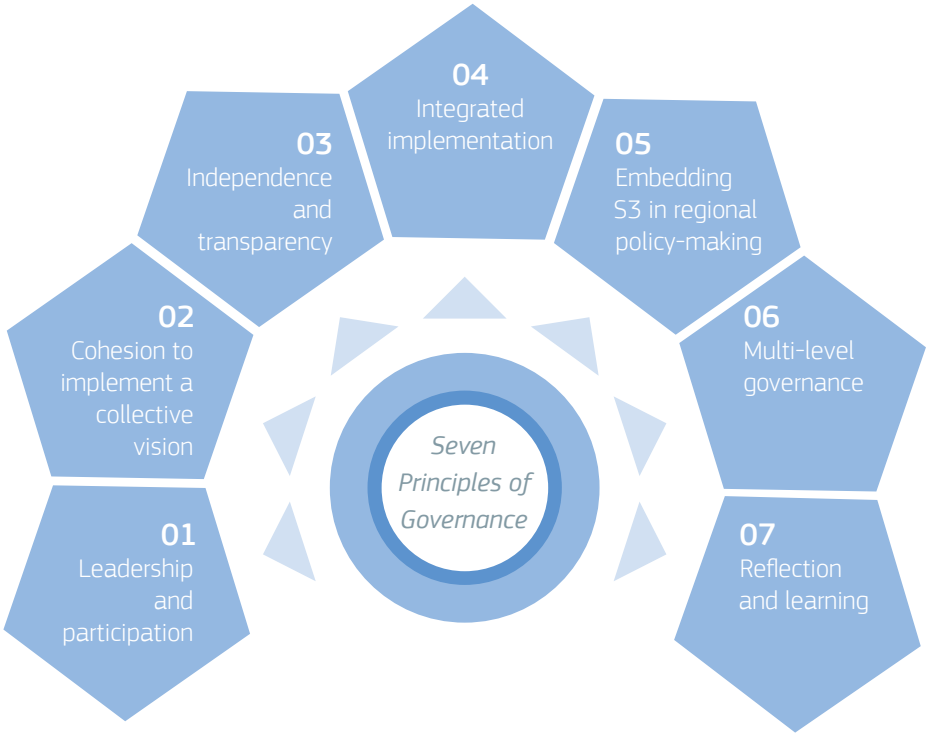


Figure II.1 Seven Principles of Governance

Why governance is important for the implementation of S3

Putting the concept of smart specialisation into practice relies on a well thought out approach to governance. This was underlined by the RIS3 Guide, published by the S3 Platform to support the design of strategies at the beginning of Europe's S3 journey.

Many of the points made then, such as the need for participation of the entrepreneurial community, a transparent approach to priority setting and an effective monitoring mechanism, continue to apply in the implementation phase. Some issues become even more relevant, such as integrated policy delivery and the design of funding calls.

The importance of governance to S3 implementation: key issues

The following list gives an overview of the main elements of S3 implementation and how governance is an important factor in their success:

Project selection in funding programmes

Calls for projects should flow logically from the S3 and subsequent funding programmes. The avoidance of *ad hoc* calls increases trust and predictability among regional actors. Advanced notification and support for applicants with less experience of applying to funding programmes will allow for richer and more inclusive implementation.

Structural and legislative changes

The success of funding instruments is highly dependent on changes in the wider institutional environment that is influenced by structural conditions, such as education systems, fiscal incentives, redistribution of policy competences, or simplification of procedures. Implementation of S3 therefore needs to be taken up across government departments and not just by one individual funding body.

Updating of priorities through a continuous EDP

The process whereby entrepreneurs and other innovation actors help national or regional authorities to select priority domains for investment does not finish once an S3 is adopted, as described in chapter I of this Handbook. A participative approach that integrates the principles highlighted in this chapter, combined with recourse to objective economic and social analysis, will help to prevent dominance of established interest groups and the stifling of innovation among less powerful actors.

External cooperation

Prioritisation is best done through benchmarking with other innovation systems, but this external dimension needs to continue into the implementation phase. Governance structures could involve external observers, and funding programmes can be promoted beyond the region/country to increase investment. Clearly, appropriability and Intellectual Property Rights (IPR) issues would have to be carefully addressed here. This involves a pro-active role for government that includes bringing people together from within and outside the region/country, acting especially on behalf of smaller firms who lack the capacity to network nationally or internationally.

Audit and State aid

Complex procedures must be communicated simply. The risk of claw back of State funds must be minimal to ensure confidence among applicants. This will depend on a competent and accessible public sector and on clear rules, especially where competence/accessibility is itself being pursued.

Monitoring and evaluation

Continuous monitoring and evaluation is a requirement when large sums of public money are at stake. Innovation strategies like S3 are new in many places, which makes this aspect of implementation even more important to learn for the future. Successes and failures must be transparently recorded. Mechanisms can be designed that allow experimentation, reflection and feedback to ensure a country or a region learns throughout the S3 implementation process. Such mechanisms need to mix objective analysis such as quantitative indicators with the perspectives of stakeholders. Demonstrating the extent to which progress has been made, and having a clear vision will retain motivation and trust in future elaborations of S3.

Seven principles of good governance for implementing S3

1. Leadership and participation to enable innovation

Leadership is critical for both the design and delivery of S3. In many respects it is highly influenced by the stability of the political and policy processes in the region or country in question. This stability allows for the development of strong relationships between different levels or departments in the public sector and between the public, private and third sectors. Building on these relationships, the public sector has a key role to play in the implementation of initiatives that emerge from involvement with a variety of actors.

Political leadership is the most critical ingredient in the S3 repertoire because it creates the capacity to mobilise every other ingredient. However, smart political leadership will recognise (and enable) an ethos of collaborative and distributed leadership because different skill sets are required at different stages in the S3 lifecycle. This is not however a simple process, due to the complexities of policy-making in the real world. On the one hand, S3 may need different types of leadership at each stage of the implementation process — sometimes called collaborative or distributed leadership — and this requires a certain amount

of flexibility from the stakeholders involved. On the other hand, there is a constant tension between the delegation of responsibilities, which might increase participation, and the centralisation of decision-making processes, which facilitates the process of making difficult choices but runs the risk of alienating stakeholders. Leadership is also linked to transparency, setting a limited number of measurable objectives, and allowing stakeholders to judge the performance of the public sector.

A strong, developmental and leadership role for the public sector can be crucial for the implementation of smart specialisation. However, this is not only related to the management of funding programmes. While it may be the most visible form of public support in the S3 process, funding is most effective when integrated and bundled up with other forms of assistance — some of which may be intangible — like the convening powers and brokering capacities of regional governments and development agencies. Public authorities can play a role in bringing together stakeholders and institutions which do not usually work together, support horizontal and capacity building activities, or make early investments which the risk adverse private sector may ignore.

Different types of leadership are needed for S3 implementation. Political leadership is the critical ingredient, because it has the capacity to mobilise all other ingredients.

An example of leadership

Leadership is critical for pro-active and transformative governance of smart specialisation. While all other aspects are important (including the design of structures, transparency and independence, multi-level arrangements), leadership is essential for effective governance. This example is particularly instructive for countries of Central and Eastern Europe. Other factors have also been important, such as the role played by foreign investment, but leadership is the facilitator, and arguably what drives the strategy forward.

South Moravia (CZ) is a region with a rather recent history of regional innovation policy, where the different organisations in the public and private sectors have fewer resources and less experience compared with other regions with long-lasting experience of regional innovation systems. An important step was the creation of the South Moravian Innovation Centre (JIC). Established by the regional office together with Brno City Municipality and four different universities, it has been re-

Learning from practice

South Moravia (CZ)

sponsible for managing innovation policy since 2009. JIC led the building of a broad-based coalition of actors which was quite challenging due in large part to historical reasons and the lack of formal sub-national competences. JIC established strong links with the public authorities that support it, with research centres, industry representatives and other institutions. These links were used to develop a broadly agreed upon S3 towards a coordinated implementation strategy with real impact on the economic fortunes of the region.

More information

JIC website (English):

https://www.jic.cz/en/

2. Cohesion to implement a collective vision

Leadership and participation are also essential to secure a certain amount of cohesion to the innovation system, which in turn can help spur further action from the public sector. By cohesion we mean the creation of a shared vision for the future development of the region, a collective will which helps to ensure that stakeholders remain committed to the strategy after the design process ends and the more challenging implementation stage begins. This is achieved through processes of open and honest engagement, where stakeholders have the capacity to voice their opinions, which are then seen to be taken into consideration. These processes also benefit from politicians and policy-makers openly discussing their objectives, not only with the employees of different public sector organisations but also a wider group of stakeholders. This ensures that everyone is aware of how policies are being designed and how they are to be implemented, which is not the case when decisions are made by only a small number of people via an opaque process. This generates high levels of uncertainty both among the public officials who will eventually have to deliver the instruments and the organisations that will benefit from them, and prevents individuals from planning for the medium and long-term.

The shift from 'current economic performance' to 'potential economic performance' of territorial units (national/regional) — inherent in S3 — requires a reasonable understanding of their development potential as well as a grounded exploration of future development trajectories. A shared vision is necessary to pursue ambitious long-term objectives and

avoid vested interests to prevail when priorities are chosen and revised or when project selection criteria are defined. A critical factor is the capacity to put in place an effective feedback mechanism between the search for entrepreneurial knowledge and the regional vision, and to foster the quality of entrepreneurial discoveries which will subsequently affect decisions and choices about the vision itself. In the best engagement exercises, the S3 becomes a collectively-owned strategy of the territory rather than the plaything of government, ensuring a stronger commitment from the different actors that implement the strategy on the ground and providing better chance for policy continuity beyond EU funding. This sense of directionality is well illustrated in the logical narrative of Lapland's S3 vision and strategy.

Learning from practice

Lapland (FI)

A shared vision based on specific assets and values

Lapland (FI) is the northernmost region as well as one of the most sparsely populated in Europe. Due to its specific geographical characteristics, Lapland has explicitly based its S3 process on the elaboration of a joint vision of how to build on its strengths as an Arctic region.

According to Lapland Vision 2030, "Lapland's Arctic Specialisation Programme 2030", the region would enjoy a leading position in exploiting and commercialising Arctic natural resources and conditions. One of the objectives is to "offer its inhabitants an original, attractive place for living", embracing a wider concept of territorial development than the one usually found in industrial policy. It aims to promote economic regeneration by linking smart growth with sustainable (economic, ecological and social) development, putting in place the aforementioned effective feedback mechanism between the EDP and the regional vision. The S3 vision is the result of a regional governance model coordinated by the Regional Council of Lapland and built on partnership and participation.

The Regional Council of Lapland has implemented a model for regional governance to enhance smart growth and sustain the balance in sustainable development. The model emphasises the importance of a bottom-up approach by actively involving

all the 21 municipalities of Lapland, as well as industry, educational institutions, development agencies and research organisations. It also promotes a partnership between the regional and national level, as the Regional Council takes a strategic lead, but in collaboration with other regional stakeholders and national level governmental institutions.

More information

Lapland S3 strategy "Lapland's Arctic Specialisation Programme" (English):
http://tinyurl.com/he3ka83

The S3 implementation process needs to be effective as well as accountable — we must not forget, in other words, that good governance is also a means to an end and not just an end in itself.

3. Independence and transparency

The issue of prioritisation is one of the most pressing in the implementation of S3, requiring transparency and clear guidelines for the process of decision-making to be seen as fair, inclusive and robust. Where the governance and funding functions are integrated within the same government department, there is a much greater risk that the project selection process may be subjected to political pressures from within or captured by dominant interest groups from without. To overcome this problem, the project selection process needs to be — and seen to be — transparent, fair and robust. To retain the trust and credibility of regional stakeholders, the governance and funding systems need to be separated and rendered accountable to different departments.

Independence can also be strengthened through links with organisations outside the region, which can prevent closed networks dominating the implementation of the strategy, especially with regard to the use of public funds. Furthermore, the presence and importance of outside networks has a big influence on the capacity of regional authorities to encourage local firms to establish links that can lead to new or improved areas of activity.

These links happen via multi-level governance, networks between local and non-local public organisations (for example INTERREG projects or the Peer Exchange and Learning activities of the S3 Platform) and through consultation processes that are informed by organisations such as universities or companies located outside the region.

Separating governance from funding

The government of **Wales (UK)** has gone to great lengths to ensure a clear and credible division of labour in the governance and funding of its S3.

The Department for Economy, Science and Transport is responsible for managing the design and delivery of S3 projects and, to ensure this process is transparent, inclusive and robust, the department created a wholly new Innovation Advisory Council for Wales in 2014, composed of senior representatives from the triple helix of government, business and higher education.

One of the key roles of the Council is to provide independent oversight of the implementation of S3 in Wales. This governance function is wholly separate from the funding function, located in the Wales European Funding Office, which reports to the Finance Minister. Although clarity and transparency are assured in such a *modus operandi*, the fact remains that this arrangement can also create coordination challenges and institutional tensions and these problems need to be openly acknowledged if they are to be properly addressed.

More information
Innovation Advisory Council for Wales webpage (English):
http://tinyurl.com/zm8ra3j

Learning from practice

Wales (UK)

4. Integrated implementation

S3 benefits significantly from integrated approaches that can target the many different areas in which a sector needs support. This means avoiding a silo-type approach to policy, where each government department delivers its own strategy without coordinating with others. Integrated S3 implementation combines two perspectives:

- A vertical focus on specific priorities, as recommended by the S3 concept. This could include, for example, targeted support to knowledge transfer from universities to firms related to a particular economic activity. Purely horizontal approaches to R&D or skills provision, for instance, hinder the design of integrated approaches, because it is

impossible to know in advance which domains or sectors will use these instruments and therefore to plan a coordinated delivery;

- A holistic approach to sectoral development that goes beyond narrow concerns with science and technology or infrastructure and seeks to understand their multiple and inter-connected needs. This necessarily impacts on a range of policy areas from employment and education to environment and planning. S3 cannot be implemented by one type of instrument, rather national and regional authorities will have to consider various policy mixes[1].

Learning from practice

Navarre (ES)

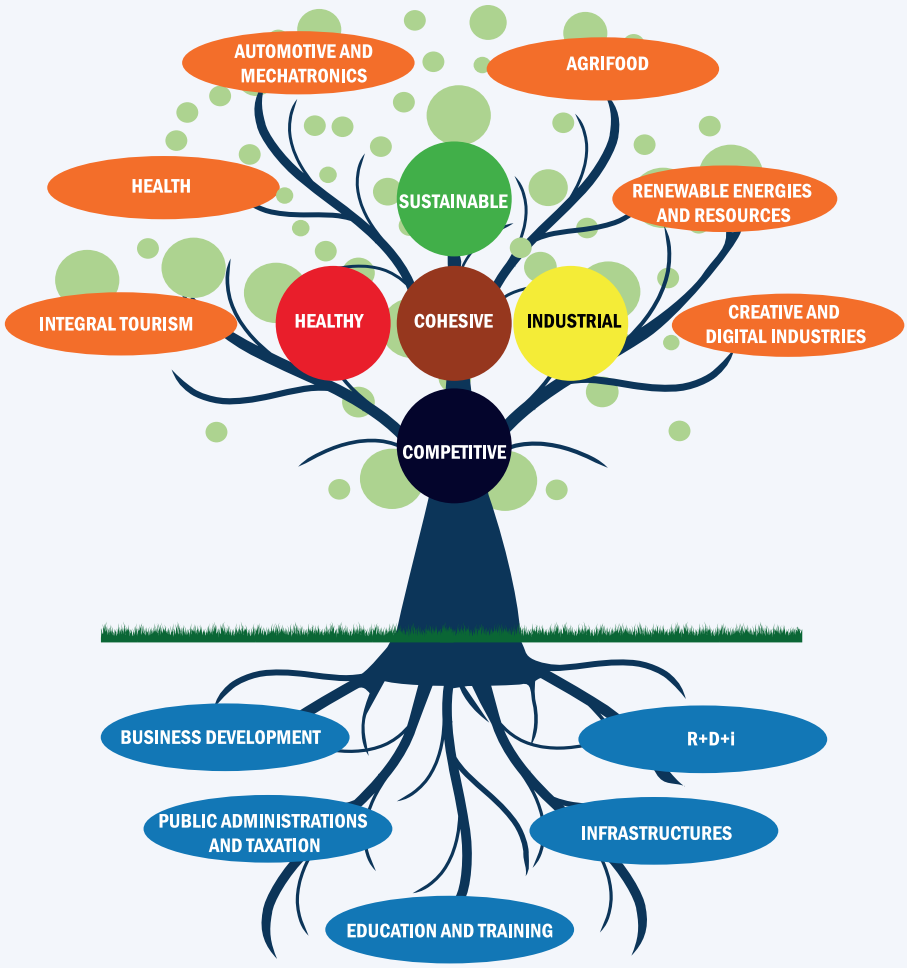
Integrated policy fields

In order to prevent a silo type approach, a two-vector response is envisaged by **Navarre (ES)**. The first entails a vertical focus on specific clusters, as recommended by the S3 methodology. Purely horizontal approaches to R&D or skills provision, for example, hinder the design of integrated approaches, because it is impossible to know in advance which domains or sectors will use these instruments and therefore to plan a coordinated delivery. The second is a holistic approach to sectoral development, which goes beyond narrow concerns with science and technology or infrastructure and seeks to understand their multiple and inter-connected needs. The S3 of Navarra in Spain is an example of how integration can be achieved, as illustrated in the figure. The sectors chosen for support are identified in the top part of the diagram, whereas the roots list the five key factors that affect their overall competitiveness. The desire to integrate all core areas of policy action is likely to generate important synergies between different government departments and between operational programmes. Furthermore, the choice of priorities has been narrowed during the current updating process.

This integration was also achieved by the existence of an executive agency (Fundación Moderna) that was responsible for the development of a new economic plan for Navarre (Plan Moderna) as well as its operational deployment and monitoring. After recent regional elections, Fundación Moderna team was integrated in SODENA, a government agency promoting regional development mainly through financial instruments

(venture capital, seed capital, etc.). The new government expanded SODENA's former mission to accommodate the S3 and set up a new governance model with a threefold objective:

- Introduce rationality and coherence bringing together the existing public agencies managing development programmes;
- Empower public and private stakeholders of the region in the S3 governance system;
- Improve coordination of the agency with the different government departments involved in its implementation.



More information

SODENA webpage (English):

http://www.sodena.com/index.php/en

5. Embedding smart specialisation in regional policy-making

On a practical level, the governance system of innovative regions tends to benefit from a diversity of organisations, a clear separation of labour between these organisations and constant engagement between them. This is observed in some of the more affluent regions of Europe, such as Bremen, Upper Austria and Scotland, as well as among less wealthy regions with good governance systems such as South Moravia in the Czech Republic. However, the distribution of roles and responsibilities between governmental and non-governmental organisations is likely to depend on the institutional background of each region/country. In the specific context of smart specialisation, governance structures should be designed to link stakeholders involved in the selected priority domains with the regional government. An illustrated example of this is shown by the governance arrangements of Friuli Venezia Giulia (IT).

Learning from practice

Friuli Venezia Giulia (IT)

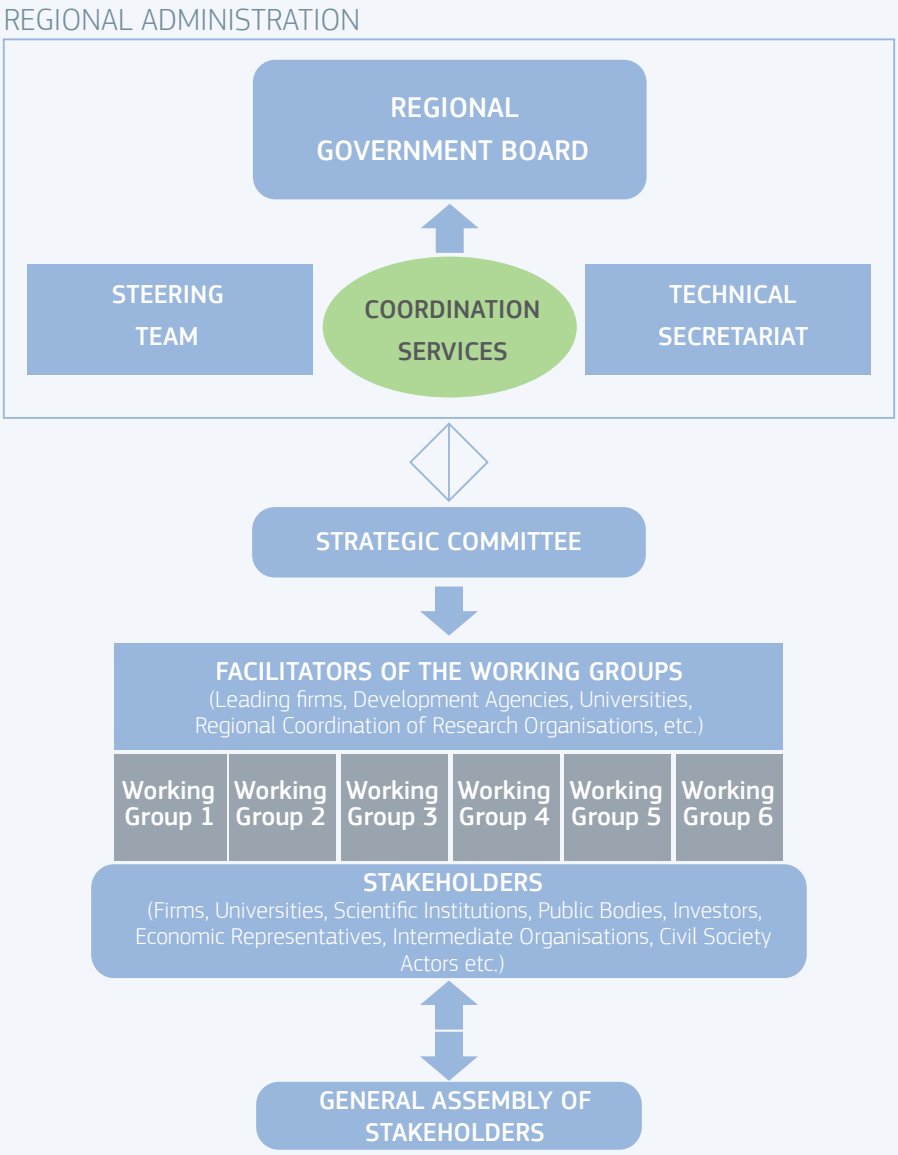
A governance structure designed for implementing S3

In order to achieve a better coordination of funds, transparency of processes, communication and evaluation, the S3 governance structure elaborated in **Friuli Venezia Giulia (IT)** clearly defines the roles and functions of the different bodies involved:

- The regional administration provides political direction and ensures the management of the S3 by running the Steering Team and the Technical Secretariat. The Steering Team coordinates the S3 process and provides input to other departments responsible for complementary policies.
- The Strategic Committee is the connecting body between the regional administration and stakeholders and provides input in the implementation phases of the strategy and its revision. It is composed of the coordinators of the S3 Working Groups as well as the representatives of economic associations and the Regional Coordination of Research Organisations, representing the productive fabric and the regional scientific system respectively.
- The S3 Working Groups are instrumental for the implementation and revision of the strategy and refer to the S3 priority areas as well as specific themes. They are open to

representatives of the whole regional innovation system.

- The General Assembly of S3 stakeholders allows the community of regional innovators to meet and discuss how the strategy is developing. Both the Regional Government Board and the Steering Team participate and animate the General Assembly, thus ensuring a connection between the political leadership and the regional community.



Note that this structure could benefit from a stronger presence of delivery organisations, linked to the regional administration to ensure coordination but enjoying a significant level of autonomy.

More information

Friuli Venezia Giulia S3 webpage (Italian):

http://tinyurl.com/zhwoe9p

In general terms, S3 implementation can be aided by well-funded and professionalised delivery agencies, which are owned by the government but have some degree of independence[2]. This allows them to maintain good links with the private sector, research institutes and other relevant stakeholders and also to accumulate knowledge and experience of delivering policy instruments irrespective of the government's composition.

Even though these systems are not perfect (as we can see in the case of Navarra, where a change of government led to a significant reconfiguration of governance arrangements), the existence of these agencies guarantees some coherence and continuity in the system, and this in turn creates a capacity for learning over time. Moreover, the separation of labour between these different levels — with ministries taking responsibility for strategic decisions, and agencies for design and execution — prevents the system from being captured by small number of interest groups. Importantly, a clear mandate from the regional government is needed to provide legitimacy for the implementation bodies. Furthermore, a process of empowering non-governmental delivery organisations that help in building consensus and new collaborative relationships between relevant actors should be started, especially in regions which lack strong institutions.

Regionally appropriate and inclusive governance arrangements enable the S3 approach to become 'embedded' in the region. Several examples from across Europe show how this is happening in practice, increasing the chances that S3 can withstand future changes in the political environment:

- **Delegation of authority for the S3 process to executive agencies** as in the case of the Swedish Agency for Economic and Regional Growth, which has responsibility for smart specialisation at national level, while VINNOVA (Swedish innovation agency) promotes and invests in smart specialisation through national programmes and calls for proposals;
- **Increasing responsibility of regional delivery agencies**, as in the case of Emilia Romagna (IT) where the implementation of S3 (including responsibility for process continuity, local animation and monitoring of results) is ensured by the horizontal coordination of different agencies in charge respectively for industrial research and technology transfer (ASTER, through the High Tech Regional Network), territorial development (ERVET) and the Digital Agenda (LEPIDA);
- **Creation of stable platforms for regular discussion between research and business**, such as the smart specialisation platforms in Norte (PT) that have been put in place for each of the region's eight prior-

ity domains. The platforms include a large number of firms, the regional science and technology community, and cluster and sector associations. The participation of an international expert is envisaged in order to reduce the risk of interest group capture. The platforms are intended to lead to proposals for calls from the regional operational programme;

- **Establishment of public-private quadruple helix partnerships** with a certain degree of autonomy but well connected to the regional administration. The Central Denmark Growth Forum (DK) is a partnership between business representatives, unions and employer organizations, education and research institutions, municipalities and the region. Among its tasks related to regional development, the Growth Forum functions as an advisory board for smart specialisation and decides on which projects should be supported by the European funds.

Beyond good institutions and a general openness to collaborative approaches, embedding smart specialisation into effective governance arrangements require a high degree of professional skills and strategic capabilities particularly on the part of regional governments, i.e. people with adequate capacity to steer and put into action processes of regional strategy building. Mechanisms should put in place along the whole policy cycle to ensure that the development of the strategy itself becomes a learning process for the region by providing support to institutional learning and accompanying the different actors involved (e.g. by technical assistance, transparent communication on current practices, specific training, interregional cooperation, participation in mutual learning experiences as the ones provided by the S3 Platform). Additional reflections on this crucial aspect are presented in the last section of this chapter "Reflection and learning".

6. Multi-level governance

The need for integration across policy areas is closely related to the importance of 'multi-level governance'. This refers to a distribution of responsibilities between different geographical levels of government (such as local, regional, national and European) and importantly the cooperation and coordination between them. It is particularly useful to understand and manage because the integrated nature of S3 that has just been outlined means that competences are usually distributed across many levels, depending on the country.

A territorial approach understands and integrates sub-national or sub-regional differences and how they can contribute to the overall implementation of a region's strategy.

Coordination and synergies between regions, territories and cities with regard to regional/national Smart Specialisation Strategies are required to avoid fragmentation, and to increase the impact of investments across Europe.

Learning from practice

Spain

Implementing S3 on the ground: the emergence of new territorial actors

A good example of the challenge to integrate new S3 institutional actors in existing regional S3 comes from the Basque Country in **Spain,** where the City of Bilbao aims to design its own strategy in a process that is separate from the official S3 of the Basque Government. These two processes need to be synchronised otherwise territorial rivalry will impair them both. However, Bilbao may be the bellwether of a new trend towards urban development-led innovation policies, where cities become de facto 'living labs' to test the feasibility of new technologies and novel ways of living and working.

The emergence of sub-regional S3 initiatives in Spain is not limited to urban settings but has also occurred in rural contexts, where a number of LEADER Local Action Groups (LAGs), such as in the regions of Extremadura, Castilla-La Mancha, Andalusia, Catalonia, have started to integrate elements of smart specialisation into existing rural development practice, so as to make it more knowledge-based and innovation-oriented.

Among them, the Smart LEADER strategy of the TAGUS LAG in Extremadura is the first local (sub-regional) experience of a rural development strategy that has attempted to connect with the principles of smart specialisation. Although this pilot initiative is aligned with and supported by the Extremadura S3, continued coordination between the two governance levels will be critical to its implementation.

Finally, in Catalonia new territorial partnerships are explicitly planned in the regional S3 implementation phase to promote major collaborative initiatives, such as in the case of the Territorial Specialisation and Competitiveness Projects (PECT). In a parallel line, Barcelona has developed the project RIS3BCN in order to ensure that priority sectors and strategic technologies relevant for Barcelona are included in the smart specialisation strategy prepared by the Government of Catalonia (RIS3CAT), including resources and mechanisms for policy delivery. RIS3B-

CN intends to work as a platform of collaborative leadership among the city economic agents.

More information

Spanish S3 strategies' repository — REDIDI network (Spanish):
http://tinyurl.com/z77gpld
Basque Country S3 webpage (English):
http://tinyurl.com/j4pngvl
Catalonia S3 webpage (English):
http://tinyurl.com/z922yqy
TAGUS project webpage (Spanish):
http://www.tagus.net

Territorial governance arrangements need to combine stability with flexibility to capture the twin benefits of continuity and novelty. In practice, this means that governance systems will need to be responsive to two challenges: the ever changing relationships between national and sub-national levels and the emergence of new institutional actors, whether they are sectorally or territorially based. During the process of designing S3, several examples can be identified that illustrate how different territorial levels have been integrated into national or regional governance arrangements. The challenges and solutions depend on local R&I institutional governance set-ups.

- In Spain, regions have broad policy competences which are reflected in the regional S3. However, the need for coordination between the strategies at national level has been recognised and a network set up to prevent repetition, foster synergies and encourage interregional learning[3]. In addition, the Basque Country, Extramadura and Catalonia have seen S3 processes emerge at sub-regional level, increasing the participation of different territorial actors.
- In England, R&I competences remain mostly at national level. However, as part of its S3, Local Enterprise Partnerships (LEPs) have been tasked with delivering S3 at the local level and a "Smart Specialisation Advisory Hub" has been created to identify good practices and disseminate them throughout the LEP network[4].
- Romania has also sought to build capacity at the sub-national level through the involvement of Regional Development Agencies (RDAs), with six of them having developed their own S3. The national govern-

ment has responded to the emergence of the regional strategies with the introduction of 'regional concept notes', delegating responsibility to the RDAs.

- The Czech Republic has introduced a scheme called "Smart Accelerator" to be supported by the national Operational Programme for Research, Development and Education. The aim of the scheme is to create administrative structure for the S3 implementation and EDP management (and in wider terms for the overall management of R&I) in all the Czech regions. Each region is invited to submit a project based on their needs (there is no one-size-fits-all approach) and it gives the regions an opportunity to address their weaknesses in terms of S3 and R&I management. The key issue for the Czech Republic is how to ensure that the nationally designed and implemented European Structural and Investment Funds (ESIF) OPs are implemented according to different regional needs, thus making the most of the new regional institutions.

Learning from practice

Romania

Regional governance

Romania has a national S3 developed by the Ministry for Education and Scientific Research, which is also responsible for its implementation, monitoring and evaluation. The priority areas were selected through a consultation process, but the strategy remains limited in its weak territorial focus, since it does not reflect and establish areas of competitive advantage in each of Romania's eight regions. At the same time, six RDAs independently elaborated regional S3, and two were submitted to the S3 Platform's peer review process — RDAs are Non-Governmental Organisations (NGOs) responsible for regional development and also intermediary bodies for the Regional OP —.

These regional S3 were formally endorsed by the Regional Development Councils which are governance bodies that include all the elected presidents of county councils in the region. Yet, the status of the strategies is unclear, since the regional level in Romania does not have formal competencies or administrative responsibilities, and therefore neither the financial resources for implementation. In Romania, there is an urgent need for more complementary action between national and sub-national levels. In order to address the issue of sub-national priorities, the Romanian government has proposed a solution that will in-

volve external expertise and an active role for RDAs in shaping planned investments in R&I. The RDAs will develop Regional Concept Notes based on a common methodology elaborated by the Managing Authority of the Regional OP. These documents will reflect the priorities selected by the regional S3, and in those regions without a strategy, they will effectively be set, taking care to follow an EDP. These notes will give recommendations on the location, economic sectors and activities that could benefit from ERDF support.

Whereas the focus will be on technology transfer and uptake by SMEs, other areas of the S3 policy mix can be considered, which seems essential to adopt a broad perspective on innovation as promoted by smart specialisation. The RDAs are to be given responsibility for consulting actors and for elaborating concept notes which will be endorsed by Regional Innovation Consortiums composed of stakeholders. Importantly, the regional approaches will be coordinated at national level and synergies with other instruments will be considered.

More information

Regional Operational Programme 2014-2020, Managing Authority's website (Romanian):
http://inforegio.ro/ro/

7. Reflection and learning

A final characteristic of good governance systems is the stability that makes learning possible over extended periods of time. Some of the most successful regions in Europe in this respect have been developing innovation policies since the early 1990s and have gone through several rounds of policy design and implementation. For this learning to take place the principles discussed earlier are important, particularly the role of strong networks with local and non-local representatives and a stable, yet open governance system. In countries and regions with less experience of innovation policies capacity needs to be built, which can be seen in the examples of Romania and Slovenia. In addition, the implementation of S3 needs to be closely monitored, not only in terms of outputs and outcomes of policy intervention, but also to ensure that some of the processes described in this chapter are operating effectively. More comments on monitoring can be found in chapter V "Monitoring".

Institutional learning should aim to build the capabilities of stakeholders as well as those of the public administration

Governments throughout the EU are becoming increasingly aware that the public sector can play a much more positive role in fostering innovation by promoting innovation within the public sector (by experimenting with more agile and creative forms of public administration for example) and via the public sector (by leveraging the power of purchase for example). One of the new ways in which governments at all levels are learning to learn is through the creation of Innovation Policy Labs (IPLs). Originally inspired by the likes of NESTA, the UK-based innovation agency, IPLs are being created all over the world as governments and their partners in business, civil society and higher education collectively strive to better understand the emergent world of open innovation and assess what it means for each partner[5]. The world of open innovation has been fashioned by a number of factors, including:

- **The pace of innovation** appears to be accelerating, (i) as technological change abbreviates product and service lifecycles, (ii) and as new entrants like China and India enter the global race with new business models based on frugal innovations;
- **The nature of innovation** could be changing, (i) as disciplines and technologies converge, (ii) and as large vertically integrated firms realise that they need to open themselves up to a wider and more diverse range of knowledge sources to complement and challenge their in-house R&D labs;
- **The agents of innovation** are changing in the sense that users and governments are becoming major players in the era of societal challenges, where consumer-citizens are assuming the role of co-producers with traditional agents (i.e. firms) in sectors like renewable energy, food security, healthy ageing, water conservation and climate change mitigation, etc., i.e. sectors where governments also play key roles as producers, users, purchasers and regulators.

Innovation Policy Labs enable governments to 'look outside the box' in a more agile and less risk-averse fashion. This is also aided by participation in international networks such as ERRIN[6] and EURADA[7], as well as the S3 Platform, which allow regions to find out how others are approaching the same challenges and possibly adopt similar approaches at home.

This intelligence-gathering capacity will be especially important for national and regional governments that wish to learn what works where and why in the S3 implementation process.

A learning experience for both policy-makers and stakeholders

The importance of stable and participative governance structures for learning over time is well illustrated by the **Slovenian** S3. The major initial challenge in preparing the strategy was to rebuild the innovation system following a period of disintegration resulting from uncoordinated policies, high levels of unpredictability and incoherent funding programmes that failed to support different elements of innovation across economic value chains in the past.

To build coherence and predictability of funding instruments over time, a systematic and continuous consultation process among quadruple helix stakeholders has been put in place. So called Strategic Research and Innovation Partnerships (SRIPs) have been established as pillars of the S3 implementation process.

The partnerships are flexible institutional structures for each of the priority areas. Certain innovation activities relate to several S3 domains or may be identified as horizontal (i.e. key enabling technologies such as ICT, photonics, robotics, etc.). Therefore, each of the SRIPs is established as a tailor-made structure, while some actually relate to more than just one priority area. The on-going consultation activities of the SRIPs include a continuous EDP, further prioritisation and Strategic Research Agendas (SRAs), joint internationalisation and performance in Global Value Chains (GVCs), planning of legislative changes (such as standardisation to design efficient innovative procurement and pre-commercial measures), as well as human resource management and capacity building.

Today, the Slovenian S3 offers a valuable means for strategic direction, within its nine clearly defined investment priority areas. It has led to joint approach among the three most relevant ministries, providing a stable and robust platform for consulting and responding to signals from the R&I system. The ongoing process provides a learning experience for all stakeholders, which over time can also lead to the modification

and improvement of the governance mechanisms.

More information

Slovenia's S3 webpage (English):

http://tinyurl.com/z56azhy

By way of concluding

- This chapter outlines principles of good governance that can be applied in different regions of Europe, in a manner specific to each particular place.
- The public sector has a vital role as leader, facilitator and enabler of innovation.
- Implementation of S3 is favoured by integrating policy areas within the country or region.
- Governance arrangements themselves need to be innovative and reflective, allowing a process of learning throughout implementation.

Notes

[1] The JRC Technical Reports JRC91917 (2014) is dedicated to the concept of policy mixes for the implementation of S3: http://s3platform.jrc.ec.europa.eu/-/ris3-implementation-and-policy-mixes

[2] Examples of such agencies acting as intermediate bodies responsible for the regional S3 and for the articulation of innovation policy activities across the regional, national and interregional level are Fundecyt-Pctex in Extremadura (ES) and ARITT in Centre (FR).

[3] More information can be found at www.redidi.es.

[4] Learn more at: http://smartspecialisationhub.ktn-uk.org/

[5] See: http://www.nesta.org.uk/project/innovation-growth-lab-igl.

[6] See: http://www.errin.eu/

[7] See: http://www.eurada.org/

References

Rodríguez-Pose, A., Di Cataldo, M. and Rainoldi, A. (2014), "The Role of Government Institutions for Smart Specialisation and Regional Development", Joint Research Centre Technical Report, JRC 88935. http://tinyurl.com/h82zejt

WIRE 2015: Session on Governance for implementing Smart Specialisation Strategies (4 June 2015). http://wire2015.eu/en/programme/presentations/day-1
https://www.youtube.com/watch?v=mVxZt47wnok

CoR-ECjointeventon European Innovation Ecosystems: Good Governance and Effective Support for Smart Specialisation (26January2016). — http://cor.europa.eu/fr/events/Pages/innovation-ecosystem.aspx

Guide to Research and Innovation Strategies for Smart Specialisation (2012), European Commission. http://tinyurl.com/hzr4zk3

FP7 funded research on smart specialisation (SmartSpec). — http://cordis.europa.eu/project/rcn/109041_en.html

Chapter III

From priorities to projects: selection criteria and selection process

Contributors

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Highlights

Call design, selection process, selection criteria and evaluators' contribution are some of the focal points addressed in this chapter. Here are the main questions discussed:

- What policies should be impacted by S3?
- How to select the right projects?
- What challenges need to be faced for a correct S3 implementation?

Policy relevance

Even perfectly-drafted strategies will not achieve the expected impact unless they are implemented through careful coordination of resources.

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Introduction

The aim of this chapter is to support policy-makers in the task of translating smart specialisation priorities into projects' implementation, i.e. to help them bridging the gap between 'strategies on paper' and actual policies.

Experienced policy-makers know that moving from policy strategy design to implementation is a challenging task. Quite often the strategies are just stored on office shelves or drivers and stakeholders recall them when the moment to launch monitoring or evaluation arrives.

It is fundamental to assume that S3 is a process to be developed on a continuous basis and as such, it should be well reflected in policy instruments' implementation.

Translating S3 into actual policies

Implementing S3 entails different things that are not mutually exclusive. Five different categories are proposed as main ways to turn S3 into reality:

1. Launching strategic initiatives;
2. Re-orienting existing programmes;
3. Changing strategic agendas from existing operators;
4. Aligning infrastructure;
5. Setting up S3 fora.

These five channels are discussed below and concrete examples from S3 experience are provided. Policy-makers can pick up some or all of these possibilities. Their choice is constrained by two elements:

1. The degree of Managing Authorities' impact on the innovation field,
2. The breadth of the policies' portfolio.

Implementing S3 may lead either to fill gaps in policy mixes in regions that are less endowed, or to fine-tune an existing mix in regions that already benefit from a full-fledged policy mix. In practical terms, there is a need to define adequate selection mechanisms and criteria for projects to be funded in the implementation phase of S3.

Implementing S3 may lead either to fill gaps in policy mixes in regions that start from less advantegeous conditions, or to fine-tune an existing mix in regions that already benefit from a full-fledged policy mix and implementing structures.

Five categories of action for implementing S3

The transition from S3 on paper ('smart intentions') to S3 on the ground ('smart actions') can be realized through five different types of actions.

Figure III.1 Five categories of action for implementing S3

1. Launching new strategic initiatives at the core of the identified smart specialisation areas

The strategic initiatives are bold actions which typically gather a large community of actors of the quadruple helix around a theme that lies at the heart of a S3 priority domain, selected through the strategy process. These long-lasting initiatives aim at transforming the productive fabric towards the niches identified in the strategy. They often follow directly from the identification process, which has provided the opportunity for these key actors to interact and exchange about potential projects.

Strategic initiatives serve as a framework for several smaller projects, which are linked together through interactions and through the complementarity of actions. Since those initiatives are pilots, it is very important to embed learning mechanisms into them right from the start: this will facilitate deciding on their continuation, scaling up or dismissal.

Launching strategic initiatives at the core of S3

In **Sweden**, the programme called "VINNVÄXT - Regional Growth through Dynamic Innovation Systems" funds large and comprehensive initiatives in the regions throughout the country. Projects are selected through a competition process (calls for proposals) where the best proposals get a 10-year period funding. Through this programme, a limited number of 'growth initiatives' focusing on regional strengths, receive up to 1 million euros per year, to which is added a minimum of 50% regional co-funding. These triple helix initiatives gather businesses, researchers and public sector organisations, and aim at transforming the regional productive fabric within a long-term framework.

The implementation of the smart specialisation approach in the region of **Flanders (BE)** takes place mainly through the support of "Spearhead Clusters". They are officially recognized by the Flemish government according to their capacity to organise an emerging cluster or transform an existing one with societal and economic value-added for the region. Under its New Industrial Policy (NIP), Flanders set up a comprehensive instrument, the Transformation and Innovation Acceleration Fund (TINA).

Its purpose is to reinforce and accelerate the marketing of innovation with strategic potential. It provides capital investment to projects proposed by groups of firms and it finances grand projects within the spearhead areas. In addition, the NIP employs a wide range of existing policies and programmes with a strategic focus on their transformative potential.

Pilot exercises are also implemented to determine policy mixes for specific spearhead clusters: a policy learning exercise was launched in November 2013 - April 2014 to experiment with three specific transformation trajectories: 3D-printing, recycling of critical metals in vehicles, renewable chemicals based on algae.

The aim of the exercise was learning what kind of 'whole-of-government' policies are needed and what type of governmental organisation will be required to partner in the implementation of these new value chains.

The Regional Council of **Satakunta (FI)** was in charge of the preparation of the regional S3. To that end, strategic regional platforms were established around selected priorities. These platforms set reference criteria for actions and project development within smart specialisation areas. Regional developers are called to pick up one of the chosen themes and then build an articulated project. For instance, Prizztech Ltd, a not-for-profit business development company owned by municipalities in Satakunta region, under the theme "Bio-economy" developed the initiative "Gas economy" focusing on building:

- Bio-power plants for waste water treatment plant,
- Biogas production plants in rural areas,
- Biogas filling stations for road traffic.

When a new action is planned, the following set of requirements must be addressed by the developers/initiators:

- Is there a new idea linked to the S3?
- Is it possible to find linkages between this domain and the one of the regional smart specialisation platforms?
- Is there already program-level activity linked to this idea/domain?
- Are there other projects which this idea can benefit from?

More information

VINNVÄXT webpage (English):
http://tinyurl.com/hp4437f
Flanders' website (English):
http://www.flanders.be/en
Stakunta's Prizztech Ltd website (English):
http://www.prizz.fi/en

2. Adjusting existing programmes to align them with S3 orientations

Introducing a new criterion dedicated to the "contribution to the smart specialisation areas" in competitive programmes is the typical way to turn S3 priorities into reality. The idea is not to incorporate restrictions according to sectors in the programmes but to ask for demonstration of contribution to S3 areas: this can be done by restricting projects to those falling in these priority domains, as in the Provence-Alpes-Côte d'Azur Region (FR).

Learning from practice

Provence-Alpes-Côte d'Azur (FR)

Re-aligning existing programmes with S3 priorities

After the S3 adoption, the French Region **Provence-Alpes-Côte d'Azur (FR)** launched several research projects' calls for proposals falling under five "strategic activity domains" (each including detailed smart specialisation axes) or three "key general technologies" defined in the S3. One of the calls is targeted at research projects with the aim of reinforcing existing strengths in research teams and gathering individual scientists into more coherent research groups. Research carried out in this framework should be multidisciplinary, have a clear regional scope and be in line with the industrial needs; moreover, submitted proposals are eligible only if they match the S3 priorities. Another call is a joint national-regional tender aimed to provide funding for enterprises' innovation initiatives in the form of subsidies for feasibility projects or reimbursable loans for R&D and innovation projects.

The funding schemes implemented in previous programming periods used to support research and innovation activities in a wide variety of domains in the public and private sectors: thanks to the adoption of the S3, their scope has been narrowed down to smart specialisation domains.

More information

Call from PACA region, Appel à Propositions PO FEDER-FSE / PI1a, 2015 (French):
http://tinyurl.com/jr345kt

Call issued by the PACA region and the Commissariat Général à l'Investissement: "Appel à Projets Investissements d'avenir", action "Partenariat Régional d'Innovation en Provence-Alpes-Côte d'Azur - Soutien aux projets d'avenir des PME", 2015 (French): http://pri.bpifrance.fr/#offre_100

3. Changing strategic agendas of existing players to serve the S3 priorities

A typical situation in regional systems is the lack of alignment of key players' strategic agendas around regional priorities and between themselves. The S3 exercise provides an opportunity to search for synergies and complementarities between these key players, around the smart specialisation domains. Typical examples include refocusing of research, education and training programmes to serve the needs of the S3 domains, as is the case in Dutch Limburg with an enhanced role of universities.

Learning from practice

Limburg (NL)

Changing existing players' agendas towards S3

With the S3, a new role is given to universities in the Dutch region of **Limburg (NL);** previously, universities were not strongly involved in the regional policy-making process. While resource concentration is not new to the region, S3 has brought about a more fine-grained definition of top clusters. The strategy provides greater support to university campuses through the "Brightlands programme". This scheme facilitates the creation of science and industry clusters, e.g. by financing R&D infrastructure and equipment, and promoting Higher Education Institutions' (HEIs) activities (education programmes, new research departments). Two Limburg campuses, specialising in bio-based, biomedical and health activities, signed a ten-year-contract with the region.

During the S3 process, regional knowledge-production institutions presented their joint plan "Knowledge Axis Lim-

burg" with the aim of creating synergies between the various Brightlands campuses. Brightlands also fosters the establishment of links with neighbouring knowledge-production institutions and firms from Germany and Belgium. Moreover, the campuses articulate strategies and funding sources from various levels:

1. Regional (province-level),
2. Supra-regional (South-East Netherlands (Brainport strategy) and South Netherlands (the territory for ERDF and S3),
3. National,
4. Transnational (TTR-Elat, cross-border INTERREG project).

More information

RIS3 for Zuid-Nederland, the region compromising Noord-Brabant, Limburg and Zeeland (the South Netherlands), 2013 (English):

http://tinyurl.com/zmgb2gm

4. Defining priorities and criteria for funding innovation infrastructure to align them with the S3 agenda

Decisions on funding innovation infrastructures are risky: they need to be taken in a long-term perspective and they typically involve large amounts of public resources. In addition, policy-makers confronted with such decisions face divergent pressures from various interest groups defending different models and missions for such infrastructure.

With S3, policy-makers are better equipped to decide on which infrastructure to promote, in line with the needs identified for the smart specialisation domains.

Learning from practice

Bremen (DE)

Establishing research and innovation infrastructure to support S3 priorities

The Land of **Bremen (DE)** is promoting the establishment of a research centre on new materials, the EcoMaT Technology Centre (Centre for eco-efficient materials & technologies), which will support several smart specialisation domains. By 2016, it will reach a regional scope in the context of S3. In co-operation with Airbus, EcoMaT is to provide a central, cross-cluster perspective for Bremen-based companies and research organisations in the field of materials and lightweight construction, with direct benefit to the aerospace sector in particular, which is one of the S3 regional areas.

More information

Bremen's webpage (German and English):
http://www.efre-bremen.de

5. Establishing platforms or fora gathering the key actors of the S3 domains

Platforms are important, first from an internal perspective: they help to further fuel the EDP, further refine the smart specialisation domains, and facilitate the development of projects aligned to the S3 priorities. Second, they are important from an external perspective in linking regional actors with those outside the region and foster their inclusion in joint international innovation platforms (as the open innovation arenas in Skåne, Sweden).

Thematic smart specialisation platforms also facilitate cooperation among Member States and regions with similar S3 priorities[1]. They have been created to provide additional support to practitioners and stakeholders of smart specialisation in actions leading to matching experiences, developing joint investments and elaborating common ideas around implementation of S3 priorities. These platforms can contribute to identify comparative advantages among regions, facilitate the share of relevant data and pipeline additional investments.

Establishing platforms or fora gathering key actors of the S3 domains: a comparative approach

Learning from practice

Scania (SE)

Scania (SE) supports open innovation arenas — one for each specialisation domain identified in the S3 — gathering key actors to stimulate joint work on projects cutting across traditional sectors. Their aim is to increase actors' knowledge about each other's operations and to investigate the potential for new collaborations, production and growth opportunities. Collaboration is organised and facilitated by a cluster organisation, the main purpose of which is to create added-value for all stakeholders: businesses, universities and university colleges. The open innovation arenas are expected to attract national and international resources and to create long-term, sustainable conditions for development of innovative capacities and competitiveness.

More information

Scania webpage (English):

http://www.skane.com/en

Ensuring S3 strategic vision through projects

The ERDF OPs reflect the policy mix developed within the S3 process. It is clear that calls for project proposals and selection processes have to consider ventures which can contribute to the vision and objectives defined in the strategy for selected smart specialisation areas. Exceptions might occur when the continuous EDP identifies new areas of specialisation to be explored. But even then, the essence of the strategy should be respected.

Transitions from priorities to projects will be facilitated when priority's areas are not 'too broad'. In areas that are too broad (for example "energy") the projects selected and supported may be scattered and dispersed. Connections, synergies and spillovers will hardly happen and critical mass — which is the ultimate goal — will not emerge. In a narrower priority area, called for example "energy efficiency in industry" the same number of projects will be more connected, providing potential scale, scope and spillover effects. The S3 approach promotes activities pursuing R&D in the selected areas

of smart specialisation. The funded activities should enhance collaboration among potential partners and promise great potential for innovative spillovers. Furthermore, the scope and impact of selected projects should be significant for each regional or national economy, towards real niche development or regional growth in global value chains. Finally, it is strongly recommended to check whether there is a real need for public intervention: some projects might be so profitable, and the risk of R&D activities failure so low, that public support is not required.

Calls' design

The calls reflect characteristics of policy-mix instruments which are to be implemented for certain purposes and under certain conditions. In order to sustain the clarity of policy intervention, calls should be well structured and consistent. Calls must define coherently: their objectives, time schedule, allocated budget, target groups, application conditions, funding rules, information on ways of proposals submission, evaluation, awarding and final agreement signing, among others. The exact matter of calls is a key aspect that needs joint reflection and should be discussed with stakeholders as part of EDP, in order to reach a common understanding on what is to be launched, to be improved, or to be clarified. The schedule of calls can be gathered and promoted in work packages drawing on EU practices. Usually, each work package is designed for a limited period of time (with a two to three-year perspective). This helps orient potential applicants in view of the preparation phase.

Selection process

On the one hand, the S3 approach promotes identifying the priorities that may lead to sustainable growth and jobs in a country or a region. On the other hand, it is necessary that the selection process of associated calls promotes competition among applicants, allowing them to choose one or several fields of intervention which could facilitate synergies within S3 priorities.

Selecting projects to be funded during the implementation phase of S3 is to be done with great care, as these projects are likely to become emblematic of the 'S3 in practice'. For many actors, the essence of smart specialisation will only become fully understandable through the lens of these concrete projects.

Lessons from implementation of this type of strategies point to several good practices with respect to project selection processes:

- S3 governing instances (e.g. Steering Committees) should work in close relationship with OP Managing Authorities to ensure that full use of ESIF portfolio is made for related projects.
- There is a place for formal (eligibility) and qualitative assessment of proposals. According to the S3 approach, assessment of project proposals should emphasize qualitative and impact aspects which come after formal eligibility tests.
- Incorporating external views in project selection is a good way to mitigate the problem of powerful vested interests (which may not be in line with S3 priorities) and against a concentration of projects on and around the same standard agents/themes.
- Two-stage processes for project selection are interesting practices to consider: these help to gather a large set of project ideas serving the S3 purposes, and also to subsequently suggest grouping of several proposals, or the development of linkages between various project proposals;
- Establishing a 'performance reserve' for funding projects is a good way to ensure a concentration of funds on those projects that prove to be most effective to reach the intended goals of the strategy, as well as to keep space to support new and valuable projects that emerge at a late stage in the funding cycle.
- Linked to the previous point, foreseeing an exit strategy for projects that are not delivering against expectations, and thus not serving the goals of S3, is another way to ensure a concentration of public funds on the most effective projects.

Learning from practice

Romania

Entrepreneurial ideas coming out of the R&D sector in smart specialisation areas

In **Romania**, the S3 process pinpointed a potential for future entrepreneurial activities in the areas of smart specialisation. It highlighted the need to support the creation of new companies with the support of ESIF. The S3 policy mix includes an instrument called "Innovative start-ups and spin-offs" which has the objective to finance the realisation of new or significantly improved products based on research results (industrial research / experimental development). This policy instrument targets start-ups and spin-offs whose research shows promising results or own use rights (patents, IPRs,

etc.). The instrument is meant for entrepreneurs with business ideas but short of capital. As the expected projects scope is rather narrow, the *de minimis* aid rule was implemented. The grant value covers up to 90% of the project eligible costs, the rest should be supplemented by private contribution. In the project selection procedure, the administration first reviews the applicants and projects' eligibility, including completeness of documents and administrative conformity of the request for financing file. This verification is based on a Yes/No questionnaire. In the second step, individual assessments are done by specialist evaluators based on criteria grouped in an evaluation fiche. In the third step, panel evaluation is done based on a panel fiche. The proposals should meet the following selection criteria:

- Relevance: product innovativeness; economic and technical viability; project contribution to the development of research activities in the enterprise; product coverage of a real need or an opportunity identified in a certain economic sector; new jobs creation potential.
- Quality and maturity: consistency between the activities described and the objectives; project budget — reasonableness, completeness, etc.; methodology and risk assessment; implementing capacity — how the skills and qualifications needed are acquired; quality of the business plan.
- Sustainability and operating capacity: financial sustainability; contribution to sustainable development; equality of chances, gender, anti-discrimination and disability; level of cooperation - international, regional, with enterprises or research organisations, etc.; financial correlations - sensitivity analysis of the project financial data based on at least three variables.
- Importantly, the eligible smart specialisation proposals are awarded additional bonus points if the project is in line with smart specialisation areas.

More information

Romanian OP for research and innovation (Romanian):
http://tinyurl.com/j7xkdyf

Selection criteria

An adequate set of selection criteria is to be used and very clearly communicated for project selection. These criteria might also be used for on-going projects monitoring and for deciding on continuation of funding.

Relevant selection criteria for projects in view of implementing S3:

Alignment with S3

- Incorporation of S3 objectives in project objectives
- Expected contribution to smart specialisation domains

Regional dimension

- Expected regional benefits
- Possibilities for scaling up and capitalizing on project's results to create spillovers beyond project partners
- Stakeholders' involvement, bottom-up approach, endorsement by a wide community of regional actors
- Synergies with other regional initiatives or projects

International dimension

- Demonstration of positioning of projects in a wider value-chain perspective
- Development of capacity of regional players to link with and embed external inputs
- Intensity of external cooperation for the benefit of the project

Viability-sustainability

- Financial viability
- Legal viability
- Presence of private co-funding
- Alignment/complementarity with national orientations
- Inclusion of clear targets and realistic follow-up process and indicators

Funding mix

- Appropriate articulation of public regional, national, EU (ESIF and other) and private funding sources

Following the principles of ESIF, selection criteria may give additional weight to calls and projects that can contribute to the establishment of synergies between various instruments funded by different sources. The co-existence of EU funding with national and local assistance can be also stimulated through specific selection criteria.

Learning from practice

Centre-Loire Valley (FR)

Synergies between S3 and funding sources

The Regional Agency for Innovation and Technology (ARITT) of the French region **Centre-Val de Loire (FR)** did an S3-insipred exercise for the OP funded with EARDF. This initiative covered agriculture activities, agro-food and forestry with calls for expression of interest issued to select proposals in the context of the European Innovation Partnerships with DG AGRI of the European Commission.

Project proposals need to respond to the following criteria: (a) quality of project presentation and argumentation, (b) adequacy of a project with themes, (c) quality of partnership, (d) value in terms of innovativeness and complementarity, (e) impact on the region.

More information

ARITT Centre-Val de Loire's webpage (French and English):
http://www.arittcentre.fr

Actors and their role in the process

Implementation bodies

The implementing institutions play the most important role in this phase of S3. They should not be considered as mere funding dispensers; they are expected to have a real impact on the OP implementation in line with S3. It is also fundamental that staff is trained and convinced about their contribution to the S3 vision and objectives. Consequently, their enthusiasm might be distributed to the applicants and evaluators. Quite obviously, enhanced training and motivation will improve understanding of the role of implementation bodies.

Managing Authorities

An important role is played by the Managing Authorities at national or regional level: they are responsible for accepting any changes in the OP instruments and project selection mechanisms.

Availability of Managing Authorities' representatives to clarify doubts and assist project applicants is a key factor of success. On occasion, short adjustments to improve project proposals can be advised. However, this assistance needs to be available in equal manner to all applicants.

Evaluators

Project selection is done by evaluators. They can form evaluator panels or groups of experts who give views and judgement on the projects. It is recommended that pools of evaluators reflect the EDP stakeholders' structure in order to balance scientific and business competences and enrich the selection process with a variety of perspectives.

The selection of evaluators is an issue that could be facilitated by the EDP. Its participants are usually well-informed and a common agreement on candidates can be reached. In principle, evaluators are expected to be familiar with S3, but if not, they need to be trained so as to understand their role in the S3 implementation.

One of the key questions related to evaluators is to what extent foreign experts should be involved in assessment processes. This engagement has pros and cons as it depends on different factors such as: (i) the ability of applicants to provide proposals in a foreign language, (ii) the existence of a national pool of experts. The presence of foreign experts gives the evaluation process an international seal of quality.

Stakeholders' involvement

The selection process as a part of the implementation of S3 requires a continuous EDP in order to contribute to the design of calls and to analyse the experience accumulated since the first calls. This facilitates checking basic assumptions regarding S3 objectives and smart specialisation priorities.

Conclusion and challenges ahead

- To fully benefit from the S3, it is important to avoid restricting funding to ESIF action lines and measures. S3 should be considered as an integral part of local RTDI policy. Successful implementation needs a jointly agreed upon approach, coordination of resources and use of available complementary policy instruments.
- The implementation system relies on a continuous EDP and monitoring and evaluation activities. The feedback of stakeholders on the selection process can improve it and its results or advance its results.
- As public funds are limited, one should make sure that they are not scattered across projects of sub-critical size. The economic impact on the regions and countries must be assessed in due course. Improvements in overall innovativeness, job creation, regional niche development, general purpose technologies, which can generate spillovers, are factors to be considered in the project selection process.
- The selection of limited areas for investment may well cause reaction from those who feel 'excluded' as well as from those who have been 'included'. Information which comes from the former may be useful in order to revise the decision on selected areas, while the latter may not generate the projects/impacts which are expected. Both these sources of information are useful in monitoring, evaluating, rethinking policy choices.

Notes

[1] On the occasion of the Smart Regions Conference (Brussels, 1st and 2nd June 2016), two thematic S3 platforms on Industrial Modernisation and Agri-food were officially launched with the purpose of facilitating synergies among regions with common priorities. These platforms join the existent thematic platform on Energy (S3PEnergy) created in May 2015 to ensure match-making of Member States and regions that have planned investments in energy innovation.

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Chapter IV

Transnational cooperation and value chains[1]

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Highlights

Rationales for transnational cooperation in smart specialisation are many — from improving quality and effectiveness of policy to fitting into global value chains. To support the suitable decisions with Whom, Why, on What and How to collaborate, the chapter will re-examine:

- What are the instruments and frameworks that facilitate the different stages of S3 cooperation?
- What are the challenges faced by regions and countries expanding transnationally and how to address them?
- How does S3 integrate local economies into the global networks?

Policy relevance

Staying competitive in the global economy depends on transnational activities and participation in Global Value Chains (GVC). Transnational collaboration and learning are crucial to achieving economic growth.

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Introduction

The importance of the global innovation networks calls for a regional innovation policy that goes beyond regional and national borders[2]. Cooperation in S3 involves sharing knowledge, coordinating and exploiting synergies with S3 initiatives in other countries and regions. Transnational[3] cooperation is a key component of S3s. Cooperation and outward-looking disposition promote an understanding of the competitive position of the country/region with regard to others, and with respect to GVCs. There are many reasons why policy-makers should open up their S3 for transnational cooperation: gaining from access to wider business and knowledge networks, getting necessary research capacity, reaching out to other markets, expanding business opportunities, combining complementary strengths, and joining GVCs are just some of these. Most importantly, transnational collaboration is an investment which brings growth to the countries and regions involved.

Outward-looking Smart Specialisation Strategies enhance opportunities to take advantage of the best available knowledge.

Stages and instruments of transnational cooperation in S3

Regional innovation eco-systems determine the degree of collaboration intensiveness. S3 cooperation may start on a bottom-up basis involving data and information exchange, moving on to experiment with collaborative projects, and later on evolving into strategic platforms and alignment of funding instruments allowing for a comprehensive policy approach to open up joint programmes and a combination of policy tools and instruments. This evolution of transnational cooperation in S3 from mutual information to common strategy may be explained like a stairway where each step opens up for the next (figure IV.1)[4] , although some steps might be missed, continuous efforts and successful partnerships help to build a solid background for joint transnational strategies. As witnessed by many regions (e.g. KNOWHUB project, TR3S project), information sharing and transnational learning through peer review have provided necessary knowledge to build one's S3 and to continue partnerships supporting implementation (Stage 1). Applying good practices (Stage 2) and using the input from foreign partners may enable regional authorities to approach challenges in novel ways, to solve problems more efficiently, avoid pitfalls and build necessary institutional capacity for new collaborations.

Going a step further and opening the national/regional programmes for outside partners (Stage 3) helps to join the transnational networks and create necessary linkages to GVCs, in this way supporting national S3 priority areas.

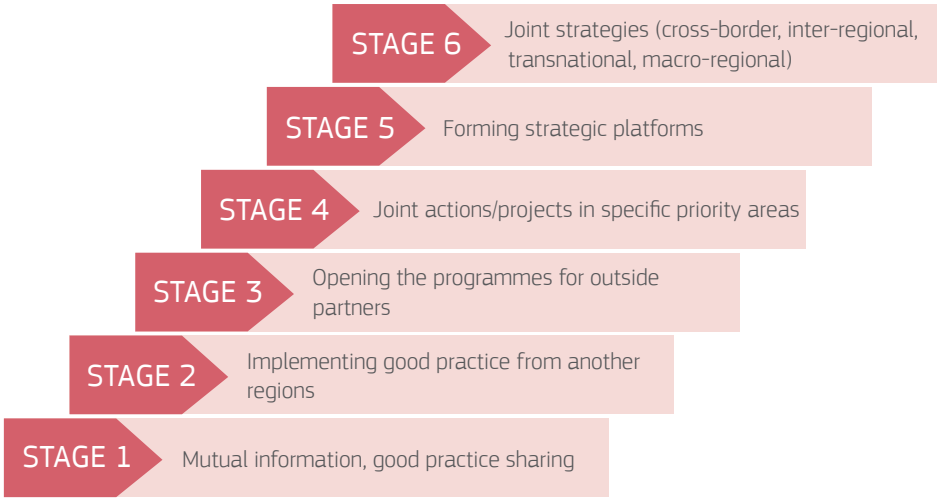

Figure IV.1 Evolution of transnational collaboration

Regions should take advantage of opportunities provided by EU ESIF regulation, which favours transnational strengthening of innovation systems and stipulates a possibility to spend up to 15% of the support from the ERDF (Article 70(2)) outside the programme area. Joint transnational projects (Stage 4) can open new trajectories for S3 priorities and redefine strategic focuses, as in the case of the BORDWIIS+ project in the example box on Lorraine and Tuscany.

To form a continuous pipeline of initiatives and projects, regional and national stakeholders join strategic platforms (Stage 5) to address common challenges or achieve common goals; this is often observed in the frame of macro-regional strategies (see the EUSBSR flagship project: BSR Stars programme in the example box on the Baltic Sea region). Joint S3 strategies (Stage 6) are an advanced form of cooperation as in the case of Galicia (ES) and Norte (PT) which help streamline funding from existing sources and exploit the synergies with policy initiatives, instruments and infrastructures in other regions.

There are many R&I policy tools that can be devised to advance a collaborative basis of S3, including joint analysis and foresight, joint research and education programmes, allowing the participation of international partners in national calls, coordination of cluster initiatives, collaborative schemes to support R&I investment in firms, etc. The following section "Aligning transnational collaboration instruments with S3 steps" suggests what instruments could be used to facilitate the appropriate steps of S3. According to the results from a recent survey on interregional collaboration in S3[5], the most common activity for interregional collaboration among the S3 authorities so far has been information-sharing, followed by cluster and innovation network initiatives, technology transfer infrastructures and monitoring and evaluation of policies.

Joint cross-border smart specialisation strategy

Forms of transnational collaboration that align R&I goals and priorities into a joint cross-border S3 are a major example of interregional cooperation. In this way, regional authorities would expect:

- to make better use of the different funding frameworks, in particular regional operational programmes and cross-border cooperation funding,
- to be more competitive in R&I excellence frameworks such as Horizon 2020 or the Era-net.

The joint strategic process between **Galicia (ES)** and **Norte (PT)** began in 2014 with the creation of the cross-border Work Group (Technical Secretariat) made up of representatives from the Galician Innovation Agency and the Northern Portuguese Regional Coordination and Development Commission.

They set up the governance for the development of a joint strategy and carried out an analysis which identified the main areas for collaboration between the two entities. At the end of this strategic exercise, a shared vision for the future was reached that includes the alignment of R&I goals and the proposal of joint priorities, actions for support, as well as an evaluation system with indicators to follow up implementation.

The joint S3 aims at reaching greater levels of critical mass based on innovation synergies and complementarities at value chain level, given the increasing combination of knowledge and production capabilities needed in innovative processes.

More information

Cross-border Smart Specialisation Strategy of Galicia-Northern Portugal (RIS3T) (English):
http://documentos.galiciainnovacion.es/RIS3T/RIS3T_en.pdf

Galicia (ES) and Norte (PT)

Aligning transnational collaboration instruments with S3 steps

RIS3 STAGE: Analysis, Monitoring, Evaluation

Which partners?

- Learn from good practice.
- Start transnational policy-learning by discovering your differences.
- Look out for good practice in other regions which generate a level of innovation higher than what you are currently able to achieve.

Policy Tools

- Evaluation of R&I policies
- Good practice transfers
- Peer reviews[6]
- Benchmarking[7]
- Foresight

Examples

INTERREG IVC KNOWHUB project (PL, HU, ES, FR, AT, DE, BG) helped to bridge the gap of knowledge, skills and experience in designing and implementing RIS3 through joint activities. — http://www.know-hub.eu

INTERREG IVC TR3S project (FI, DE, PL, RO, IT, EE, UK, HU, ES) identified the unique characteristics and assets of each region, highlighting their competitive advantages through mutual learning and exchange of experiences. — http://www.tr3s-project.eu

RIS3 STAGE: Design, visions, priorities, governance

Which partners?

- Learn from your peers, identify regions with structural conditions and problems similar to your own.
- Structural differences may lead to policy methods that cannot easily be transferred.

Policy Tools

- Evaluation of R&I policies
- Cluster policies
- Joint platforms for dialogue
- Coordination of R&I policies
- Cross-border R&I strategies

Examples

INTERREG Europe CLUSTERIX 2.0 project is an ongoing effort of 10 regions/countries on leveraging cluster policies for the successful S3 implementation, aiming to improve policy tools related to the delivery of innovation, making better use of clusters to facilitate such processes by focusing on complementary competences through the introduction of new innovation models for the development and operational implementation of strategic cluster partnerships.
http://www.interregeurope.eu

RIS3 STAGE: Implementation policy mix

Which partners?

- Some regions may have performed better than others in terms of knowledge-creation, innovation and growth.
- Consider linking into their knowledge & innovation networks; build on complementarities through deeper integration into transnational value chains and knowledge networks.
- 'Building bridges' can provide absorptive capacities and spaces for knowledge brokers.

Policy Tools

- Potential cross-border and Joint European and macro-regional RIS3 strategies
- Joint research and education programmes
- Joint provision of R&I infrastructure
- Collaborative schemes to support R&I investment, technology transfer infrastructure
- Joint Innovation support services and facilitating access to finance
- Selection criteria to encourage transnationality in calls for projects

Examples

The Swedish Agency for Economic and Regional Growth (Tillväxtverket) opened an ERDF-financed cross-clustering scheme to strengthen regional and national efforts developing new knowledge and competencies. Its purpose is to stimulate cross-border collaboration, between regions and countries, to support S3 projects based on Swedish-prioritised areas of strength for their further development and renewal. In 2015, the call for pre-studies was launched for interregional cluster collaboration projects. In the next stage the most promising 5-8 collaboration projects involving international partners will be granted support up to €1 million for 3 years in order to develop and renew Swedish areas of strength. — http://www.tillvaxtverket.se

Challenges and ways to overcome them

Regions have widely different eco-systems of innovation and correspondingly diverse directions and growth opportunities in their S3. This heterogeneity gives rise to complementarities and synergies that can be capitalised upon through interaction[8]. As can also be seen from the results of the survey on interregional collaboration in S3, the main drivers for collaboration are similar or complementary industry structure and/or research capabilities helping to jointly address common challenges.

Collaborating across borders may open new and renew existing paths of economic development.

To be able to identify new development trajectories through the EDP, regions may need to acquire access to new forms of knowledge, create new re-combinations of their resources, or move from path extension to new path-creation. All this calls for dynamic innovation policies, strengthening domestic linkages with international extensions. The challenges depend upon the level of transnational connectivity:

1. Developing a stronger regional innovation eco-system through improved internal connectivity between existing industrial and knowledge provision strengths, supported by transnational learning;
2. Growing a larger, stronger and more dynamic regional innovation eco-system by opening it up and connecting it to transnational or macro-regional knowledge;
3. Achieving economic growth through collaboration and participation in transnational and macro-regional frameworks and networks.

Challenge 1

How does transnational cooperation support the S3 process within the region?

Regions must strengthen their internal networks, creating triple helix or quadruple relationships among relevant actors in knowledge-generators (including research institutes and Research and Technology Organisations — RTOs), academia, industry, government and civil society to be able to access and gain from transnational links. Regional innovation eco-systems can be somewhat fragmented in some regions. This fragmentation could be linked to potentially critical interaction gaps. In some regions for instance, there is a long history of co-evolution between universities and industry. They tend to co-evolve by relying on one another's successes and achievements. In other regions, academia and industry are distinctly different worlds with diverging rules, placed in widely distinct knowledge networks. Addressing these mismatches through a quadruple-helix dialogue may contribute to a shared understanding of each stakeholder's needs. Transnational learning can support and strengthen the S3 process within the region.

Application of a gap analysis tool

Learning from practice

Nordland Region (NO) and Ostrobothnia (FI)

Nordland (NO) is an industrial region with inadequately-developed knowledge providers, characterised by a high level of path-dependency and learning by undertaking innovations. The regional authorities in charge of S3 searched for good practice which could be used to build a regional system of innovation for the Norwegian manufacturing industry.

They have identified the Ostrobothnian model of triple helix analysis and policy-making which is a smart specialisation planning tool initially developed and applied in **Ostrobothnia (FI)**. This good practice was later applied during the analytical stage of the S3 process in Nordland. Interestingly, this transnational learning exercise in turn, helped the region of Ostrobothnia to realise its core strengths and build them into its S3.

More information
Virkkala et al. (2014).

To address the gaps through transnational collaboration, regional authorities should examine:

- What are the gaps in the regional eco-system that need to be addressed?
- Who can help provide the knowledge that the region does not have and what incentives would they have?
- What is the proper instrument to set up the cooperation?
- Is the identified good practice applicable in the region, and what are the steps to implement it?

Challenge 2

How to strengthen a regional innovation eco-system by opening it up and connecting to transnational or macro-regional knowledge networks?

Public authorities should address this challenge by connecting their regional innovation eco-system with relevant actors external to the region through an exploration of opportunities across the following dimensions:

- Cross-border collaborations creating linkages with neighbouring regions;
- Interregional or transnational networks finding collaborations with regions and countries sharing certain common characteristics;
- Emerging macro-regional frameworks which provide platforms for more strategic collaborations to address common challenges;
- Transnational and macro-regional value chains and business networks.

Transnational S3 could allow partners to take advantage of European regional diversity, since a group of regions might develop strategies based on co-evolution and complementarity. Such a collaborative approach to policy-making can be expected to boost critical mass and knowledge complexity while further supporting ongoing entrepreneurial discoveries in various types of regions. The following example demonstrates how transnational learning, comparative analysis and the sharing of EDP outcomes helped regions identify new strategic interests in the field of Information & Communication Technologies (ICT).

Learning from practice

Lorraine (FR) and Tuscany (IT)

Gains from transnational collaboration when exploring cross-sectoral ICT opportunities in S3

This example focuses on collective efforts to exploit ICT opportunities that are so wide and rapidly changing that existing policies and strategies are very often outdated to meet the challenges and benefit from created opportunities. Policy-makers require both a clear and up-to-date overview, as well as easily-adaptable plans in order to develop, assess and modify policies. In that way, they ensure quality of life improvement whilst keeping regional strengths and assets in mind. Gathering 10 partners from nine Member States, the INTERREG IVC project, BORDWIIS+, tackled the challenge of providing policy-makers with recommendations about the way in which ICT development can be exploited within S3. The project succeeded in influencing several S3 within the participating regions.

For instance, the **Lorraine** region **(FR)** used to focus its innovation strategy on already well-established economic sec-

tors (materials, bio-medicine, energy and resources). Thanks to the project, the region finally integrated digital sciences and the needs of the markets linked to ICTs into its strategy. The region used to support these domains in a transversal way but the exchanges carried out within the framework of BORDWIIS+ enabled Lorraine to identify its assets (and weaknesses) more precisely and develop a robust meta-project based on ICT innovation. The ICT inventory, the analysis of collaborative models, and obviously the final recommendations from the projects were key elements in this policy change.

Similarly, the lessons learnt during the experience exchange directly affected the process of defining S3 in **Tuscany (IT).** The study visits of both projects, plus the comparative analysis among partners were useful to better understand Tuscany's position internationally with regard to ICT. During the EDP, and on the basis of the project's comparative analysis, "Photonics for space and medical applications" was identified as the most important R&D field. As a result, Tuscany included photonics solutions into the domains of aerospace and medical applications in its S3 final version.

More information

See the BORDWIIS+ project webpage (English):
http://www.bordwiis.eu

To be able to exploit co-specialisation opportunities adequately, public authorities might start by re-examining their existing S3 in an attempt to answer the following questions:

- What regions have similar or complementary S3 priorities?
- Is there the capacity within the eco-system to establish networks with the other potential partner, and how?
- If so, what are the common problems or challenges to be addressed?
- What are the policy tools and instruments available for this cooperation?

Macro-Regional Strategies and Smart Specialisation

EU macro-regional strategies endorsed by the European Council emphasise greater coordination between different stakeholders and the alignment of resources and strategies between private and public actors at different governance levels. This is very important for the successful implementation of S3s. To date, the European Union has put in place strategies for a number of such macro-regions covering several policies: the Baltic Sea Region (EUSBSR), the Danube Region (EUSDR), the Adriatic and Ionian Region (EUSAIR), and the Alpine Region (EUSALP). These strategies concern 19 EU Member States and eight non-EU countries. By participating in macro-regional strategies, regional and national policymakers have an opportunity to:

- Discuss the transnational dimension of S3, its importance, relevance, and practical issues;
- Learn about available analytical tools and implementation instruments, including value chain activities through cross-cluster and cross-region cooperation;
- Examine various cooperation opportunities and steps to be taken in order to stimulate transnational cooperation in areas of smart specialisation;
- Explore common interests and set up collaborative projects;
- Jointly consider how to mobilise relevant funding sources that will support their projects;
- Provide more appropriate common or coordinated replies to global issues, and thus increase the competitiveness of the macro-region.

Cooperation in S3 at macro-regional level helps explore whether and how S3 priorities envisaged in national and regional strategies differentiate, or are complementary to, their neighbouring countries and regions. It also leads to the creation of strategic linkages to tackle common challenges when engaging in joint S3 initiatives.

Learning from practice

Baltic Sea Region (BSR)

The flagship project BSR Stars

Macro-regional collaborations are good instruments to mobilise competences and align S3s, as well as to create strategic platforms for developing joint S3 projects tackling common challenges. The BSR Stars is a transnational programme and policy collaboration among 10 countries (DK, EE, FI, DE, LV, LT,

NO, IS, PL, SE) that aims at strengthening competitiveness and economic growth in the **Baltic Sea Region (BSR)**. This is to be achieved by fostering transnational linkages between specialised research and innovation nodes, leading to strategic innovation alliances to tackle common 'grand challenges', such as health, energy, sustainable transports and digital business and services. One of the recent initiatives in the flagship — BSR Stars S3 is the INTERREG Baltic Sea Region project which fosters a transnational approach towards S3 implementation. Partners (DK, FI, LT, NO, SE) will develop integrated innovation support infrastructures, such as test and demonstration facilities and new innovation management tools to leverage complementary competences stemming from their S3. The project focuses on the bio and circular economy as a cross-sectoral priority field of S3 in the BSR.

More information

BSR Stars project webpage (English):
http://www.baltic.org/project/bsr-stars-s3/
INTERREG Baltic Sea Region project webpage (English):
http://tinyurl.com/zalcpun

Challenge 3

Create economic growth through transnational collaboration and innovation

Economic growth can be facilitated through technological innovation leading to new path-creation. The next technological revolution will depend upon multiple innovations across many industrial areas linked to emerging value chains with several technological components joined in new ways. This is where European diversity may contribute: some regions have access to leading R&D and upstream innovation facilities; others have industrial skills needed in downstream testing and industrial upscaling. In larger territorial frameworks, both attributes may exist. It is time to upgrade transnational networks of knowledge and expertise, and drive the development of transnational and macro-regional value chains.

Global value chains and smart specialisation

GVCs are 'organisational systems'[9] that operate across multiple nations with complex global integration and a technology base, or 'engine', rooted in ICT. Consistent with the role of ICT and related Key Enabling Technolo-

gies (KETs) as a means of upgrading activities in some sectors in countries/regions, they can also play an important role in GVC participation. GVCs drive firm-level competitive advantage through integrating global and local competitive and comparative advantages (firm-specific and location-specific advantages).

The comparative advantage of specific industries can be assessed and their degree of participation in the corresponding industry GVC can be examined, including establishing those locations that serve as its main sources of input and output destinations. Such an analysis could point to opportunities for maintaining, extending and/or deepening the region's positioning on the GVC. Furthermore, by applying a similar analysis to other locations, a region (or country) can ascertain who else occupies significant parts of the industry value chain, how strong their positions are and whether those clusters of GVC activities in these other competing regions/countries are similar and/or complementary to their own activities. Taking account of the previously identified linkages, this can indicate whether there could be opportunities to capitalise on complementarities in other locations and the development of inter- or macro-regional and trans-European linkages. Since the data required at the digging stage may be unavailable or indeed difficult to access, there is a need to identify conduits/boundary spanners that are connected to the specific industry and have a deep knowledge of the industry cluster and its characteristics. These are likely to be found within national and regional development agencies and/or enterprise development agencies. For each location, one such individual might be assigned an S3 responsibility within the context of the industry GVC.

Platforms — real and virtual — would need to be developed to facilitate engagement among such conduits/boundary spanners so that opportunities for intra-regional industry GVC linkages can be precisely identified and pursued to promote matchmaking. A number of general principles can be summarised as Engaging, Anticipating, Assessing and Responding (EAAR):

- Engaging with the industry and its stakeholders on a continuous basis;
- Anticipating the likely evolution of the industry globally;
- Assessing the challenges and opportunities that are likely to ensue from future industry trajectories;
- Responding to these challenges and opportunities in a proactive manner.

A good example of such a trajectory of upgrading a position within a value chain is the case of BioPharma in Ireland.

The Case of BioPharma

Learning from practice

Ireland

The pharmaceutical industry forms an important part of the manufacturing sector within the economy of **Ireland**. Initial investments in the sector were primarily in bulk pharmaceuticals, now known as Active Pharmaceutical Ingredients (APIs).

Over the course of the 1970s, investment began to gravitate towards drug-product manufacture. The 1990s saw this trend continue, with many established sites reinvesting significantly and expanding into shared service activities. The advent of the human genome project saw many Ireland-based companies invest in biotech or biopharmaceutical operations. Currently, many players are investing in product and process development, thereby adopting the Development & Manufacturing model.

In addition, a number of indigenous specialist pharmaceutical and chemical companies have been established, adding to the overall diversity of the sector. The majority of Irish sites have undergone significant transformation since their first establishment. This has helped the country to move away from its traditional status as a sourcing location, primarily for APIs.

Many sites are now engaging in fully-integrated operations, offering a range of activities beyond pure manufacturing, including process and product development, manufacture for clinical trials, shared services, etc.

More information

Brennan et al. (2015).

Further information about the S3P project on GVCs (English):

http://s3platform.jrc.ec.europa.eu/value-chains

The process of EAAR is required to be followed on a continuous basis and must involve active stakeholder participation. The following areas are key for the development of the individual region's position in GVCs:

- The provision of a compatible and supportive environment via a relevant infrastructure that encompasses a robust regulatory framework,

research and technology and education;

- The upgrading and sustaining of a regional/national innovation system;
- The development of the requisite human capital pool;
- The support and nurture of collaboration among all stakeholders;
- Engagement in the upgrading of existing activities within the industry, anticipating and targeting areas of growth.

If regional authorities are to play a role in co-creating and developing European industrial value chains based on smart specialisation priorities, they should also focus on the following: interregional knowledge-building, mapping the matchmaking potential around GVCs between regional smart specialisation priorities, identifying pilot examples of interregional value chains, key stakeholders, available equipment and facilities, relevant actors/skills in smart specialisation areas, and applying the methodology described above with a view to identifying opportunities for the matching of national and regional cluster organisations in the identified value chains of smart specialisation areas.

The Vanguard Initiative is an example of ongoing multi-regional collaboration in bringing together regional eco-systems in a number of key priority areas such as Advanced Manufacturing. The initiative is committed[10] to embedding clusters or cluster-like organisations (co-creating eco-systems for public private partnerships in innovation and transformation) in regional eco-systems as the backbone of emerging cross-EU and cross-sectoral innovative value chains.

Learning from practice

Vanguard Initiative

The Vanguard Initiative and related activities

The smart specialisation **Vanguard Initiative** seeks to lead by example in developing interregional cooperation and multi-level governance in the support of clusters and regional eco-systems to focus on smart specialisations in a number of priority areas, for transforming and emerging industries. These regions seek to build upon the synergies and complementarities in S3s to boost world-class clusters and cluster networks, in particular through pilots and large scale demonstrators. These investments will bolster the competitive capacity of Europe to lead in new industries for the future and develop leading markets that

offer solutions for common challenges. The areas covered by the Vanguard Initiative are: Advanced Manufacturing for Energy Related Applications in Harsh Environments, High Performance Production with 3D Printing Efficient and Sustainable Manufacturing Bio-based Economy and Nanotechnology. The Vanguard Initiative builds on the Milan Declaration.

More information

Vanguard Initiative webpage (English):
http://www.s3vanguardinitiative.eu
Milan Declaration of the Vanguard Initiative (English):
http://tinyurl.com/z6pxr3s

In the framework of S3, regional policy and governments can play a key role in modernising EU Industry. To achieve a greater impact, these efforts can be further facilitated at EU level to allow a combination of different competences and assets that are today available across the Union. This has been confirmed in the communication[11] "For a European Industrial Renaissance", adopted in 2014, that proposed "to combine regional and industrial policy tools to create [Thematic] Smart Specialisation Platforms to help regions roll out smart specialisation programmes by facilitating contacts between firms and clusters, enabling access to the innovative technologies and market opportunities".

To achieve this while avoiding process-capture by incumbent firms, an integrated approach is necessary to ensure strong involvement of industry in the implementation of S3 and intensify cross-regional cooperation with a particular focus on making better use of clusters and fostering industrial modernisation. The ultimate objective is to facilitate concrete cross-regional innovation that could be supported through the ESIF, Horizon2020, COSME and the European Fund for Strategic Investments (EFSI). As of June 2016, European Commission services have launched three thematic smart specialisation platforms on Agri-Food[12], Energy[13] and Industrial Modernisation.

The selection of partners and the identification of an applicable good practice are never easy, as several factors and preconditions for learning must be taken into consideration. To guide policymakers in this work, various European Union bodies offer a number of tools.

Practical suggestions and support tools

CORDIS: The European Commission's primary public repository to disseminate information on all EU-funded research projects and their results.

The ERA-NET: The instrument under Horizon 2020 designed to support public-public partnerships in their preparation; establishment of networking structures; design, implementation and coordination of joint activities, as well as the topping-up of single joint calls and actions of a transnational nature.

INTERACT: The hub for exchanging information and best practice among territorial cooperation programmes.

KEEP: The source of aggregated information regarding projects and beneficiaries of European Union programmes dedicated to cross-border, transnational and interregional cooperation within the European Union and between European Union Member States and neighbouring countries;

INTERREG EUROPE Policy Learning Platforms: A new feature of INTERREG Europe which is open to the whole community of regional policy stakeholders and provides information and services for continuous learning where any organisation dealing with regional development policies in Europe can find solutions to improve their public policies in four priority areas: 1) Research and innovation; 2) SME competitiveness; 3) Low-carbon economy; 4) Environment and resource efficiency;

The European Cluster Collaboration Platform: A service facility aiming to provide cluster organisations with modern tools: to make efficient use of networking instruments, develop collaboration transnationally, support the emergence of new value chains through cross-sectoral cooperation, access the latest quality information on cluster development and improve their performance.

The Enterprise Europe Network: The instrument to support small and medium companies to take advantage of business opportunities in the EU Single Market linking up through powerful databases, sharing their knowledge and sourcing technologies and business partners across all Network countries.

EIT Knowledge and Innovation Communities (KICs): The instrument of The European Institute of Innovation and Technology (EIT) to integrate all three sides of the 'knowledge triangle' — i.e. higher education, research and business — in Knowledge and Innovation Communities (KICs) by bringing together leading players from all these dimensions to cooperate in addressing common challenges.

S3 Platform tools

Regional Benchmarking Tool: Allows for the identification of reference regions across Europe which share similar characteristics that cannot easily be changed.

Eye@RIS3 Database: An online database of S3 priorities in the EU as well as R&I strategy priorities in non-EU partner countries that enables regions and countries to position themselves, find unique niches, and seek out potential partners for S3 collaboration.

EU Trade Tool: An interactive web-based application for the visualisation of interregional trade flows and the analysis of regional competitiveness.

ICT Monitoring Tool: A web-based tool that allows users to search ESIF data (ERDF, CF, ESF, YEI and EARDF) regarding planned investments in ICT.

Challenges ahead and action points

Regional economic development follows paths based on existing specialisations. Smart specialisation means that paths must be renewed and new paths created. This requires entrepreneurial discoveries which combine knowledge in new ways and can be helped through transnational interaction. Table IV.1 provides a summary of the consequent steps to consider and actions to take in order to come to the path extension strategies and reap the benefits from transnational cooperation towards smart growth.

Table IV.1 Cumulative steps to benefit from transnational cooperation

Stairway	Challenges ahead	Action points
STEP 1	Achieve more efficient and better targeted policies through transfer and translation of good practices	• Monitor and evaluate S3 strategy, policy tools and the strengths of innovation networks through transnational comparisons; • Discover strengths and shortcomings; • Discover relevant regions with good practice achievements; • Transfer good practice.
STEP 2	More powerful policy tools through transnational cooperation, boosting scale and scope	• Use these experiences to initiate cooperation on R&I policies, cluster policies and in other relevant areas; • Launch joint actions in the areas you need to advance or improve the benefits from additional competence; • Initiate joint calls to create pool of funds for R&I projects.
STEP 3	Climb within the value chain, open new paths of economic development and renew existing ones through cross-border, macro-regional and European level extensions of networks and systems of innovation	• Proceed with development of networks of short and long distance knowledge transfer and learning; • Set up bridges between leading and lagging regions with: a. institutionalised mechanisms of cooperation; b. instruments promoting transnational mobility. • Explore strategies that form synergies and benefit from cross-border, macro-regional and European level extensions.

Notes

[1] Chapter IV draws on a paper by Mariussen, Rakhmatullin and Stanionyte (2016), "Smart Specialisation: Creating Growth through Trans-national cooperation and Value Chains. Thematic Work on the Understanding of Transnational cooperation and Value Chains in the context of Smart Specialisation", JRC Technical Reports JRC102623. — http://tinyurl.com/zs3lty7

[2] Uyarra, Sörvik and Midtkandal (2014), "Inter-regional collaboration in research and innovation strategies for smart specialisation (RIS3)", JRC Technical Reports JRC91963. — http://tinyurl.com/gl2c7op

[3] Here, the concept of transnational collaboration is inclusive of interregional collaboration.

[4] Adapted from OECD (2013). Regions and Innovation: Collaborating across borders, OECD Reviews of Regional

Innovation, OECD publishing, p. 104.

[5] Sörvik, Midtkandal, Marzocchi and Uyarra (2016), "How Outward-looking is Smart Specialisation? - Results from a survey on inter-regional collaboration in Smart Specialisation Strategies (RIS3)", JRC Technical Reports JRC100813. — http://tinyurl.com/zd946m3

[6] http://s3platform.jrc.ec.europa.eu/s3-design-peer-review

[7] http://s3platform.jrc.ec.europa.eu/regional-benchmarking

[8] Lundquist and Trippl (2013), "Distance, Proximity and Types of Cross-border Innovation Systems: A Conceptual Analysis", Regional Studies, Taylor & Francis Journals, vol. 47(3), p. 450-460.

[9] Brennan and Rakhmatullin (2015), "Global Value Chains and Smart Specialisation Strategy. Thematic Work on the Understanding of Global Value Chains and their Analysis within the Context of Smart Specialisation".

[10] Vanguard Initiative workshop on Clustering Policy (2014): http://tinyurl.com/h5u64mn

[11] https://ec.europa.eu/growth/industry/policy/renaissance_en

[12] http://s3platform.jrc.ec.europa.eu/agri-food

[13] http://s3platform.jrc.ec.europa.eu/s3p-energy

[14] http://s3platform.jrc.ec.europa.eu/industrial-modernisation

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Chapter V

Monitoring

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Highlights

Monitoring is a strategic management tool to ensure an effective implementation of S3; it should not be seen just as an administrative burden. Implementation and strategy revision need an informational basis to make informed decisions following two main questions: i) are we doing it right (i.e. are we achieving the goals of our strategy)? ii) Are we doing the right things (i.e. is our strategy still appropriate)?

Each S3 priority area has its own specificity with its own set of indicators. At the same time, all indicators are meant to track the achievement of predefined objectives.

Policy relevance

Monitoring innovation support at multiple levels of government (national, regional and local) is beneficial for avoiding duplications, enabling benchmarking and ensuring coherence. Without data or other systematic information, it will be impossible to show which goals of the strategy were achieved and which were not within the policy planning horizon.

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Introduction

Monitoring policies and policy strategies refers to an organized set of activities encompassing the iterative collection and elaboration of information on assessing the evolution and direction of socio-economic phenomena and the delivery of policy measures. Monitoring is a key element of the decision-making process allowing for adjusting the course of policy actions. This chapter outlines how monitoring should be used as a management tool for the implementation of S3. To this aim, the monitoring system would need to reflect the S3 intervention logic in all its main components and articulations. A sound S3 monitoring provides the umbrella for the monitoring of ESIF OPs. The chapter presents regional and national examples of good practices and provides references to them for the interested reader.

Implementation of monitoring mechanisms

S3 monitoring as a management tool

Besides the legal obligations directly deriving from the ESIF regulations, the S3 monitoring system should be understood as a fundamental management tool for innovation strategies. In this sense, monitoring is linked per se to governance aspects (see chapter II "Good governance: principle and challenges"). A poorly constructed monitoring system could hinder the capacity to face effectively the territorial development needs and may even prevent the proper implementation of the strategy.

S3 monitoring has to be a strategic management tool co-created together with stakeholders.

Monitoring is meant to provide information and signals for concrete action

For the Managing Authorities and S3 governance bodies, taking decisions that modify the course of policy actions may be perceived as costly and burdensome. Yet, these decisions may be vital for the effectiveness and efficiency of policy interventions. Monitoring systems are meant precisely to allow timely actions, to revise elements of the S3 on the basis of knowledge that is internal to the strategy management (without having to wait for ex-post external evaluations). Policy adjustment can be performed timely and economically, based on the information and signals provided by a soundly designed monitoring system. In this sense, the monitoring mechanism directly contributes to the process leading from the identification of S3 priorities to the definition and implementation of actual projects (see chapter III "From priorities to projects: selection criteria and selection processes").

For this purpose, it is important that the S3 monitoring properly integrate the practical information only stakeholders possess. Without critical information from stakeholders, public agents alone are less likely to learn from experience and to identify failure and success. Stakeholders and beneficiaries possess knowledge of the reality on the ground that is often beyond the reach of public authorities. Policy strategies should not be set rigidly in stone, but rather be adaptive, adjusting to the changing reality, and facilitating learning and appropriate responses. Similarly, monitoring should be seen as an emergent strategic management tool co-created together with stakeholders.

The monitoring system should reflect the S3 logic of intervention

The monitoring system should assess (i) whether expected changes are taking place, in what direction and with what intensity, and (ii) how policy measures are contributing to those changes. Specific objectives and expected changes should be explicitly defined for each and all S3 priority areas.

In order to be a proper and effective management tool, the S3 monitoring system should fully reflect the logic of intervention of the strategy. In particular, it has to capture the actual socio-economic results linked to specific objectives and expected changes explicitly identified for each and all S3 priority areas. It will also need to keep track of how policy measures deliver their output in relation to the expected changes and declared results.

In this respect, the monitoring system represents also an opportunity for strategy designers to streamline and distil the very essence of the S3 logical chain that links means to ends. Therefore, it ensures consistency among the various elements of the strategy and certifies their appropriateness to the achievement of ultimate goals. In other words, once it is properly and fully defined, the monitoring system is a way to effectively describe the role of S3 priorities and policy instruments, and their relationship with strategy objectives. Monitoring systems can help people in charge of policy implementation, stakeholders and citizens to understand the rationale of policy interventions, enabling them to constructively engage in strategy improvement and to quickly react to early warnings.

It is useful to remember that even the most sophisticated monitoring system alone cannot allow for a complete and precise identification of the causal impact of policy interventions on selected socio-economic variables (and the related indicators), net of the effects of 'other factors'. These latter factors include variables and socio-economic dynamics that are external to the cause-effect chain linking policy measures to results. Monitoring systems are only a representation of the logic of intervention of S3, not necessarily a validation of such logic.

The objectives of S3 monitoring and the types of indicators

S3 monitoring should be result-oriented. In this respect, it has two primary objectives, each associated to a different type of indicator:

- Measuring the type and level of direct output produced by funded projects that is providing a description of the deliverables of the interventions, e.g. product and process innovations adopted, people trained, start-up/spin-off funded, collaboration networks established, patents and licence application filed. To this aim, the monitoring system will comprise appropriate output indicators which need to be defined for each of the implemented policy measures and separately reported for each S3 priority.
- Measuring the degree of achievement of the socio-economic objectives and the changes taking place in the production systems for each and all S3 priorities. To this aim, the monitoring system will comprise appropriate result indicators which need to be defined for the specific objectives and expected changes linked to each S3 priority. Importantly, the monitoring system will need to ensure that result indicators are measured with reference to all potential beneficiaries (target groups) and not to just actual beneficiaries. Result indicators typically aim to measure outcomes at the level of enterprises, organizations or individuals, capturing research and innovation performance (e.g. private R&D expenditure), value-added generation, employment generation, market openness (e.g. export), education achievements (e.g. doctoral students), environmental sustainability (e.g. energy consumption), social inclusion and wellbeing (e.g. healthcare services).

The minimum required elements for a meaningful, result-oriented S3 monitoring system are therefore:

I. Output indicators (direct products of the policy interventions),
II. Result indicators (socio-economic effects in the target groups),
III. The explicit articulation of indicators by S3 priority areas,
IV. The logical link between indicators and the expected changes and objectives they will contribute to.

The baseline monitoring system sketched above can be improved, made more comprehensive and a more complete strategic management tool, by complementing it in at least the three following ways.

First of all, an important objective of the overall S3 management is to measure the actual state of implementation of the policies and related

actions undertaken in the territory in terms of funding flow and resource allocation, e.g. accepted investments, contributions paid, projects approved, beneficiaries funded. To this aim, the S3 and/or its funding programmes will need to have appropriate accounting tools and funding tracking mechanisms. In order to reflect these mechanisms, the S3 monitoring may include appropriate implementation indicators which would need to be defined for each policy measure and separately reported for each S3 priority.

In this way, the S3 monitoring could also map connections and links between projects and various European platforms and clusters and help reveal how funded projects are integrated in international value chains (see chapter IV "Transnational cooperation and value chains").

Second, in addition to results referring directly to groups of potential beneficiaries, we may want to measure the evolution of production systems within and between the S3 areas in terms of structural change and specialisation. Structural change refers to any change that can be observed in the fundamental (and generally persistent) characteristics of the economy and society, while specialisation refers to changes in the relative importance of specific economic domains, markets, or value chains.

Structural change & specialisation indicators can be included in the S3 monitoring system to capture changes in the structural characteristics of the business system, the dynamics of the production specialisation as well as the spatial concentration of economic activities, the positioning of the local production systems within international supply chains, the level and quality of interaction between private sector research and higher education institutions.

Third, the S3 monitoring system may also provide a picture of the competitiveness of the regional economy, with particular reference to research and innovation and the evolution of production systems at large.

To this aim, the monitoring system will define context indicators, recovering most of those already available from official statistical sources, or, if necessary, integrating the information base with ad hoc analysis at the level of supply chains and/or production systems.

Table V.1 summarizes the characteristics of and exemplifies the five categories of indicators.

Table V.1 Monitoring indicators and functions			
MINIMUM REQUIREMENTS FOR S3 MONITORING			
Type of indicator	Function	Examples	Sources
OUTPUT	Measuring the type and level of direct output produced by funded projects.	Number of people trained, patents and licences filed, publications, product and process innovations adopted, collaboration networks established as a direct and planned output of the project funded.	These indicators are most likely identified already in the programmes that contribute to the S3 (e.g. the ERDF OP output indicators). In the S3 monitoring system, output indicators need to be linked to specific measures of the policy mix and separately reported for each S3 priority.
RESULT	Measuring the degree of achievement of the socio-economic objectives of the strategy for each of the S3 areas.	Value-added generation, quality upgrading of products and services, private R&D expenditure, employment of qualified people, export performance, start-up/spin-off creation, education achievements, energy consumption, quality upgrading and diffusion of healthcare services in the target groups of potential beneficiaries.	Some of these indicators may be identified already in the programmes that contribute to the S3 (e.g. the ERDF OP result indicators). Some indicators will be defined by the strategy designer and tailored to the specific objectives of each S3 priority. In the S3 monitoring system, these indicators need to be defined for the specific objectives and expected changes linked to each S3 priority.

EXTENSIONS DEPENDING ON THE S3 OBJECTIVES			
Types of indicator	Function	Examples	Sources
IMPLEMENTATION	Measuring the actual state of implementation of the policies and related actions undertaken in the territory.	Funding absorption capacity, e.g.: number of projects approved, amount of EU/national/regional funds allocated, type and amount of contributions paid, number and type of beneficiaries funded, amount of accepted investments.	These indicators are most likely identified already in the programmes that contribute to the S3 (e.g. ERDF OP, Horizon 2020). In the S3 monitoring system, these indicators should be defined for each policy measure and separately reported for each S3 priority.
STRUCTURAL CHANGE & SPECIALISATION	Measuring the absolute and relative changes taking place in the production systems comprised in each of the S3 areas according to the trajectories and transitions foreseen in the strategy for each S3 priority and for the whole economy and society.	Structural characteristics of the business system (firm size, business ownership structure, projection in external markets), distribution of economic activities, technological specialisation of local production systems as measured by evaluating intermediate products of research and innovation investment (patents, inter-firm collaborations, collaboration with research institutions), demographic dynamics of firms, outreach of social interventions.	These indicators are less likely to be found in the programmes that contribute to the S3. They need to be defined by the strategy designer and tailored to the specific objectives of each S3 priority.
CONTEXT	Providing a picture of the competitiveness of the regional economy, with particular reference to issues of research and innovation and the evolution of production systems at large.	Distribution of value added and employment by economic activity, incidence of R&D by economic activity, distribution of patents by economic activity, general indicators of innovation and R&D activities.	These indicators are likely to be found in national and regional official statistical sources.

Measuring the transition and evolution of the regional economy

The current approach of **Emilia Romagna (IT)** to smart specialisation focuses on two lines of action: reinforcing and modernising existing clusters, and discovering emerging ones with a high potential for innovation and employment. The idea is to support the evolution of the industrial system towards a higher capacity for better managing the immaterial/intangible aspects of value chains. ASTER — a consortium for industrial research, technology transfer and innovation — oversees the monitoring activities of the S3 through a system capturing four measurement dimensions:

1. Implementation (implementation and output indicators);
2. Change of the regional economy in terms of specialisation domains (specialisation and transition indicators);
3. Effectiveness of the overall strategy (result indicators);
4. Evolution of the regional economy (context indicators).

This differentiated approach allows catering to different target groups. Especially 'specialisation and transition indicators' are at the core of Emilia Romagna's effort to promote specialisation in activity areas with proven strengths and potential. Within this broad category, the 'specialisation indicators' cover e.g. patents, share of new start-ups and number of SMEs per specialisation area. These indicators show how the regional economy is advancing in the selected specialisation areas. They also capture how the regional economy is moving along the selected innovative drivers. An online portal is under construction and will allow the visualisation of monitoring data. This device will be a key communication tool to inform stakeholders and the broader public about the implementation of the S3 in the region, providing freely accessible data.

More information

Emilia Romagna's presentation at the Peer eXchange and Learning workshop in Bologna, Nov. 2015 (English):
http://tinyurl.com/hpaz8m7

Communication and accessibility of monitoring data support trust-building and facilitate the involvement of stakeholders and citizens.

Engagement of stakeholders and communication of monitoring information

Ownership of the S3 process and its results. A sense of ownership of the S3 process should be common to all three main categories of actors involved in the strategy design and implementation: political policy-makers, ESIF Managing Authorities, and stakeholders. The sense of ownership provides these actors with the right incentives to maintain their engagement in the strategy implementation and hence to reach the desired results. To achieve sustainability of the S3, a shared ownership of the monitoring mechanism is also needed. A common difficulty in this respect is that monitoring data can become politically sensitive, especially if they indicate negative developments; this may in turn withdraw political support from the strategy. At the regional level, the solution lies in the involvement of stakeholders in the design and implementation of the monitoring system: the political level will be more interested in the strategy delivering, the more stakeholders are involved (see chapter I "The Entrepreneurial Discovery Process (EDP) cycle: from priority selection to strategy implementation").

Targeted communication and accessibility of monitoring information can be an important device to encourage involvement. A transparent monitoring system that communicates concisely the relevant information about S3 implementation contributes to the credibility and reputation of the ambitious transformational plan contained in the S3. Ideally, monitoring activities are organised as a continuation of the dialogue with those stakeholders that were involved during the design of the S3. In this function, monitoring contributes to build and maintain dialogue and consensus. Stakeholders can either be involved in the follow-up of monitoring activities or be empowered by having access to factual information on progress made. In this way trust, ownership and commitment can be built and maintained.

Learning from practice

Wales (UK)

Arloesiadur: a new data platform for the Welsh innovation system

The Government of **Wales (UK)** commissioned the innovation charity NESTA to develop a novel data platform that collects and assesses information about innovation activities in Wales and the interconnectedness between people and organisations. Arloesiadur (meaning "innovation tool" in Welsh) will gather data automatically from very different sources, combining es-

tablished statistics and web data (company websites, software developing or professional meeting platforms, Twitter accounts, etc.). Learning how to engage constructively with these unconventional data sources for improving innovation policies is part of the EDP. It also implies that the public sector must innovate and rethink current approaches. Valuable lessons can be learnt from this exercise on monitoring developments in S3 priority areas and dealing effectively with the lack of regionalised data from official sources, which are both common challenges for national and regional authorities across Europe.

More information

See the Arloesiadur project webpage (English):
http://www.nesta.org.uk/blog/arloesiadur-innovation-analytics-experiment

Complementarity between monitoring and mid-term and final evaluations

S3 monitoring as a management tool needs to go beyond traditional monitoring mechanisms designed uniquely for audit and ex-post evaluation purposes. It should be seen as a 'learning-by-monitoring' process with a real impact and influence on the management of the strategy. Recommendations derived from evaluation often come too late to have an impact on adjusting the strategy; this is why the monitoring mechanism complements the established mid-term and final reviews and evaluations. While evaluations give an ex-post assessment of an implementation period in the past, S3 monitoring — being placed at the core of strategic management — can provide a picture in motion of the implementation.

Independent bodies performing ex-post evaluations offer an external point of view that reinforces the legitimacy of recommendations to implement vis-à-vis policy-makers and the broader public. However, they cannot substitute monitoring as a timelier and on-going instrument to facilitate feedback and learning during the implementation phase. Based on information produced by the monitoring mechanism, evaluation will then need to be performed in order to properly identify the contribution of policy measures to the observed changes in the target variables.

A good monitoring system provides information for evaluations that

can be more precise. The relationship between monitoring activities and evaluation is represented in Figure V.1.

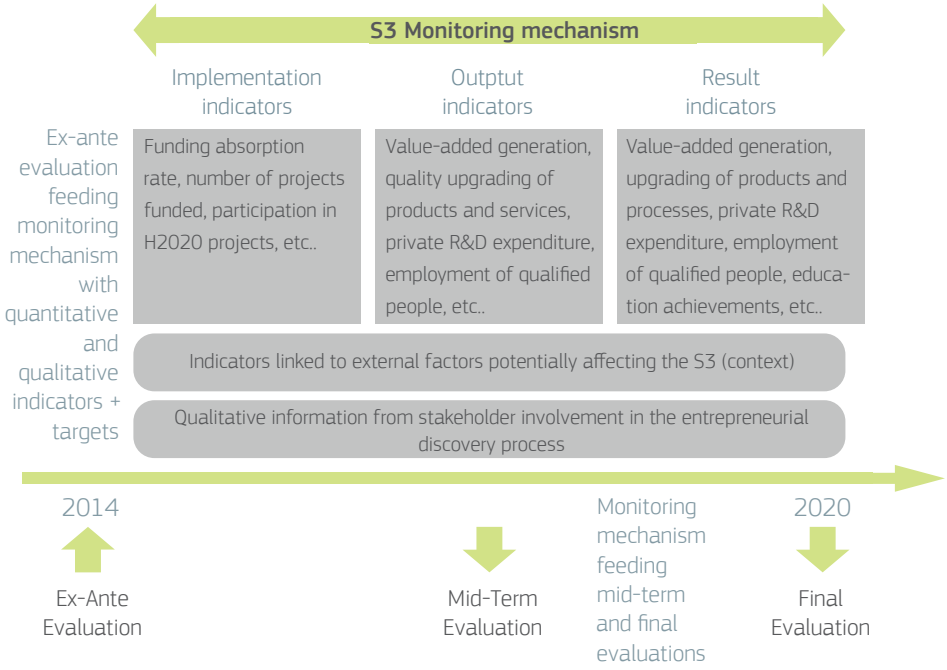

Figure V.1 Monitoring and evaluation exercises

Learning from practice

Galicia (ES)

Monitoring as a way to manage strategy objectives

The S3 monitoring system of **Galicia (ES)** comprises a panel of 74 indicators categorized into output, result and context which will be updated continuously during the programming period covered by the S3.

Data will be collected by the Galician Innovation Observatory, the body responsible for analysing the impact of public innovation policies in Galicia, with the support of a team of independent experts and stakeholders.The indicator structure identified in the Galician S3 is reported in the following chart (own elaboration based on Galicia S3):

The three interlinked sets of indicators constitute the Galicia S3 scorecard, conceived as the key management tool integrating the strategy's executive and operational levels with the aim to achieve the S3 mid- and long-term objectives.

INSTRUMENTS	STRATEGIC PRIORITIES	CHALLENGES & VISION
PERFORMANCE (output) indicators	RESULTS indicators	IMPACT (context) indicators
Performance indicators will give the picture of the project output actually realised in the framework of the strategy through the implementation of INSTRUMENTS	Result indicators will measure how actions have impacted in achieving the STRATEGIC PRIORITIES	Impact indicators will provide information on the overall progress in terms of innovation with reference to meeting CHALLENGES and realising the VISION

Intermediate and target values of indicators were fixed in mutual agreement with the Government departments involved in S3, also taking into account the historical evolution of each indicator and the expected impact of the S3 strategy. Baseline values were defined using different sources, such as the Galician Institute of Statistics (IGE), the Innovation Platform Galician (PINNG) or the Galician Service of Industrial Property (SEGAPI).

There will be an interim and a final assessment in 2018 and 2020 respectively, in which the indicators' actual values will be contrasted with the target values. The assessments will take into account qualitative information obtained via surveys to beneficiaries and quadruple helix discussion groups to further confirm the evidence gathered through quantitative information. The assessments will analyse both the evolution in time of individual indicators and the comparative performance of context indicators in the region as well as in other Spanish and European regions. In case of negative deviations from expected targets, corrective measures will be devised according to a risk analysis. In case of positive deviations, the likely causes will be analysed in order to try to transfer the experience to other areas and inspire future actions.

More information

See the region's S3 webpage (the S3 document is available in Spanish and in English):

http://www.ris3galicia.es/

The monitoring system across levels and areas of intervention

An effective monitoring system has to establish a link between various levels of intervention and different scales of socio-economic phenomena. Depending on the institutional setting, the S3 monitoring system should establish links with other monitoring systems operating at different administrative levels (e.g. national and regional). In general, it is also advisable to determine how the local S3 objectives fit into the broader national and international pictures; to this aim, the monitoring system will have to clearly define different time horizons for the measurement and assessment of different types of indicators.

Monitoring activities across sectors is essential to track innovations. Policy-makers and implementers should go beyond traditional taxonomies of industrial activities whenever it is necessary in order to better capture the evolution of the priority areas. In this case, experimental methods and targeted surveys may represent the only real solution in order to generate the information base for the monitoring system.

Relationship between S3 and OP monitoring

In practice, the OP monitoring will be the starting point for the S3 monitoring with respect to the measures which are funded by ESIF (also due to the need for an OP to report about its contribution to the S3 implementation), but the S3 monitoring will have two distinctive features: (i) a breakdown by priority areas, and (ii) a mechanism and indicators which allow to follow the specific development of priority areas at a greater level of specificity than the OP monitoring. Therefore, in the S3 results and result indicators as well as output indicators and, if present, implementation indicators need to be categorized and measured according to each priority area.

It is important to be able to actually measure the processes/outcomes/outputs that the chosen indicators are meant to capture. The problem is,, in this respect, twofold: (i) lack of statistics; (ii) lack of capacity and skills in the administration, or a combination of the two. In the first case, targeted surveys to collect original information of both quantitative and qualitative nature are recommended. In the second case, the development of skills and capacities inside the administration is encouraged together with the use/integration of external capacity. ERDF funding allows for the possibility to set aside resources to invest in both directions through Technical Assistance at the OP level, which should be fully explored.

Relevant, flexible, fine-grained indicators for S3

In the monitoring system of the region **Aquitaine (FR),** indicators are selected to be realistic within the realm of projects appraisal, and to offer the S3 governance bodies a dashboard enabling an update of the strategy if necessary.

More specifically, S3 indicators need to address the following objectives:

- Objective 1: Indicators should measure the extent to which the projects to be funded by ESIF or other type of EU funding are aligned with the selected S3 priority areas (i.e. number of projects per S3 priority);
- Objective 2: As innovation and creation of economic value emerge from the junction of two or more domains, indicators should be able to track cross fertilization (i.e. number of projects covering more than one domain or sector);
- Objective 3: As one of the most prominent goals of the S3 is to improve firms' innovation output, indicators should reflect the impact of S3 projects on firms' development (i.e. patents, collaboration, training, etc.).

More information

Aquitaine's S3 webpage (French):
http://www.aquitaine-developpement-innovation.com/strategie-de-specialisation-intelligente-s3.html#.V2QB3P7VyUl

Challenges ahead and action points

- Monitoring is still seen by many implementing bodies as an additional burden rather than as an instrument for strategic management. National and regional authorities can effectively use the autonomy they have to design a simple yet effective monitoring mechanism tailored to their particular and unique strategy and context. Only indicators providing value added to the management of strategy implementation and adjustment should be selected. Otherwise monitoring will remain a blunt administrative exercise.
- Two fundamental types of indicators should be included in the S3 monitoring system: output indicators measure the actual level of policy delivery or direct output produced by funded projects; result indicators measure the achievement of the socio-economic objectives of the strategy and the changes taking place in the local production systems. Of utmost importance for the strategy designer is to link indicators, especially result indicators, to specific objectives and expected changes explicitly identified for each S3 priority. With no explicit identification of expected changes, the strategy cannot be monitored and its implementation would be purposeless.
- Result and output indicators should be identified for each of the S3 priority areas. Breaking the indicator system down by S3 priorities constitutes a challenge for strategy designer and represents a new task compared to monitoring OPs; this also represents a defining feature of S3 monitoring that makes it different from other monitoring mechanisms.
- In addition to the fundamental minimum requirements, the S3 monitoring system can and should be extended in order to include: implementation indicators measuring the state of implementation of the policies and related actions undertaken in the territory; structural change & specialisation indicators measuring the evolution of production systems within and between the S3 areas in terms of structural change and specialisation; context indicators providing a picture of the competitiveness of the regional economy, with particular reference to research and innovation and the evolution of production systems at large.
- In several Member States, monitoring will be conducted at multiple levels of government (national, regional and local). Bringing these different information streams together avoids duplications, enables benchmarking and ensures consistency in the policy actions. Yet, consolidating many monitoring data sources in a joint system is often difficult in terms of resources and organizational cultures. A pragmatic approach is to ensure an exchange of data at least at regular events or joint fora. Running pilots like the joint innovation data portals across several regions or countries (e.g. in the Baltic Sea or Danube regions) can yield new insights for benchmarking.

Notes

[1] On this topic, see for instance the European Commission Guidance Document on Monitoring and Evaluation available at: http://ec.europa.eu/regional_policy/sources/docoffic/2014/working/wd_2014_en.pdf

References

S3 tools developed by the S3 Platform: http://s3platform.jrc.ec.europa.eu/s3-tools

Gianelle, C. and Kleibrink, A. (2015), "Monitoring Mechanisms for Smart Specialisation Strategies": Joint Research Centre Technical Report, JRC 95458 — http://tinyurl.com/hydy2mj

European Commission's "Guidance Document on Monitoring and Evaluation of the European Cohesion Fund and the European Regional Development Fund. Concepts and Recommendations (2014-2020)": http://ec.europa.eu/regional_policy/sources/docoffic/2014/working/wd_2014_en.pdf

Useful sources of data

http://ec.europa.eu/eurostat/cache/RSI/#?vis=nuts2.labourmarket&lang=en

https://ec.europa.eu/growth/tools-databases/kets-tools/

http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards/index_en.htm

http://www.oecd.org/gov/regional-policy/regionalstatisticsandindicators.htm

http://qog.pol.gu.se/data/datadownloads/qogeuregionaldata

Annex

1. Key elements of Smart Specialisation Strategies

A strategy for smart specialisation should be designed around the following key principles:

- Smart specialisation is a place-based approach, meaning that it builds on the assets and resources available to regions and Member States and on their specific socio-economic challenges in order to identify unique opportunities for development and growth;
- To have a strategy means to make choices for investment. Member States and regions ought to support only a limited number of well-identified priorities for knowledge-based investments and/or clusters. Specialisation means focusing on competitive strengths and realistic growth potentials supported by a critical mass of activity and entrepreneurial resources;
- Setting priorities should not be a top-down, picking-the-winner process. It should be an inclusive process of stakeholders' involvement centred on "entrepreneurial discovery" that is an interactive process in which market forces and the private sector are discovering and producing information about new activities, and the government assesses the outcomes and empowers those actors most capable of realizing this potential;
- The strategy should embrace a broad view of innovation, supporting technological as well as practice-based and social innovation. This would allow each region and Member State to shape policy choices according to their unique socio-economic conditions;
- Finally, a good strategy must include a sound monitoring and evaluation system as well as a revision mechanism for updating the strategic choices.

These elements should be clearly reflected in the S3 documents and exhaustively explained. Strategy developers should also bear in mind that the reason why S3 became an ex-ante conditionality for the ERDF investments in research and innovation was to ensure that the ERDF funds:

- Fit into the overall research and innovation policy (as outlined in the Innovation Union flagship's "Features of well performing national and regional research and innovation systems");
- Complement the existing national or regional funding and governance and legal measures that form part of their policy mix;
- Support effective and efficient measures that provide incentives to private Research & Innovation investments.

2. Defining priorities in a S3

A S3 should prioritise domains, areas and economic activities where regions or countries have a competitive advantage or have the potential to generate knowledge-driven growth and to bring about the economic transformation needed to tackle the major and most urgent challenges for the society and the natural and built environment. The number and nature of these priorities will vary from region

to region. Note however, that although a first set of priorities should be identified when the S3 is designed, they can be changed or modified when new information/developments make it advisable.

Priorities could be framed in terms of knowledge fields or activities (not only science-based, but also social, cultural and creative ones), sub-systems within a sector or cutting across sectors and corresponding to specific market niches, clusters, technologies, or ranges of application of technologies to specific societal and environmental challenges or health and security of citizens (e.g. ICT for active ageing, mobility solutions to reduce traffic congestion, innovative material solutions for eco-construction, etc.). While some regions or countries may prioritize one or more Key Enabling Technologies (KETs), others will focus on applications of such technologies to specific purposes or defined fields.

Social, organisational, market and service innovation, or practice-based innovation, play as important a role in S3 as technological innovation based on scientific research. This is especially relevant for regions with comparatively weaker technological and science basis. S3 involves not only radical innovation but also exploiting niches by innovating in traditional fields, through developing and applying new business or organizational models, and adapting/exploiting innovations deriving from tacit knowledge and experience in these areas.

Most often, prioritised choices of domains, areas or specific economic activities will be complemented by horizontal measures. These aim at realizing adequate framework conditions for entrepreneurship, supporting the operation of all types of firms both in domestic and international markets, and for developing inter-firm, inter-cluster, and cross-border collaborations.

3. Understanding 'niche' and 'domain' of specialisation

The expressions niche and domain in the context of smart specialisation are closely linked. To put it in a nutshell, a promising niche in a business environment is the counterpart of a promising domain in the pursuit of knowledge and innovative ideas. This relationship is so close that the two expressions are often used as synonyms.

In other words, the word niche refers to market, while domain refers to human knowledge (scientific, technological, practice-based, etc.). A market niche is a portion of user or consumer market that can be addressed by specific products or services. It is usually defined in terms of the profile of potential customers and their needs; meeting these needs is the goal of the firm identifying/occupying the corresponding niche.

The word niche carries implicitly the connotation of a small, haven-like part of the market, whereby the firm serving specific customers' needs through targeted, differentiated products, can be less exposed to low-cost, global competition. Of course, as all markets, also such niches are subject to

change and require sustained innovation and business efforts by firms operating in them. A specialisation domain is an R&D or innovation area characterized by distinctive knowledge. It can be defined either in terms of capabilities or technology or product functionality. The existence of a specialisation domain is often a precondition for having the capacity to develop innovative products or services for specific market niches.

A smart specialisation field/area is about being able to effectively match knowledge domains with market potentials, possibly in view of a niche market. Knowledge alone does not necessarily generate per se economic value of the sort reflected in GDP or total welfare estimates. On the other hand, products with little knowledge content, usually cannot defend their niches for long, if at all, and fall back to the diminishing returns competition typical of undifferentiated, so-called 'homogeneous' goods. Smart specialisation fields are therefore often at the cross-section of different sectors, technologies or knowledge domains.

4. Conceiving and structuring S3

Priorities should be identified based on two fundamental processes:

- An EDP utilizing entrepreneurial knowledge existing in a region or country and taking an entrepreneurial approach in the sense of focusing on market opportunities, differentiating from others, taking (and managing) risks and seeking alliances to optimise the access to and use of resources (physical, financial, intellectual, market knowledge, etc.). This means that policy-makers should involve all types of innovation actors (e.g. businesses, technology and competence centres, universities and public agencies, science and business parks, business angels and venture capitalists, civil society, etc.) in an entrepreneurial process for the design of S3, and assess their proposals for future development and investment. Simple surveys among these actors are not sufficient. The essence of the EDP lies in its interactive nature that brings the different actors together in a participatory leadership process to carve out jointly the smart specialisation fields and develop a suitable policy mix to implement them;
- An objective analysis of the region/country current situation in terms of research, innovation (incl. existing infrastructures), industrial structures (incl. clusters, position in value chains), skills and human capital (academic and other), demand (incl. public and societal demand), public and private budgets for research and innovation, framework conditions, functioning of the innovation eco-systems (see annex 1 of the Innovation Union flagship initiative). The analysis should take into account the economic context with a place-based focus complemented by an outward-looking dimension. It should also examine the gaps, barriers and potentials for future economic development in a knowledge-intensive perspective, including potentials that will require cooperation with innovation actors in other countries and regions. This means the use of evidence to show what type of activities have the highest chances of success in a particular region or country,

based on local assets and an examination of comparative advantages and complementarities with other European and global competitors.

Above all, priority setting cannot be regarded as a straightforward process whose outcome can be decided once and for all. Priority setting requires a certain degree of experimentation with new policy tools, ideally through pilot projects during the process of elaboration and modification of the S3. This in turn requires a strong governance system with sufficient political backing, in order to take risks and allow for failures from which lessons can be learned.

A key feature of S3 is its reliance on collaborative leadership. This means that no single institution (not even the World Bank and certainly not consultants) alone is able to write such a strategy: S3 is about partnership and should be developed with the active involvement of many different types of actors, including firms, science and business parks, universities and other research institutions, civil society organisations as well as national, regional and local authorities. The exact nature of this partnership will vary according to the national and regional institutional structures.

The involvement of entrepreneurs, broadly defined, is especially important to developing S3, and to the, aptly called, Entrepreneurial Discovery Process, because they are best placed to know what is likely to work in a particular place and with whom abroad cooperation can be helpful. This type of institutional capacity-building cannot happen overnight and should be reinforced as the strategy is developed and implemented. Likewise, the EDP can also be described as a 'journey' with no start or end. This is why the governance aspects of S3 should be constantly monitored and evaluated, and modified if necessary.

5. Risk, success and failure in the context of S3

The risk of failure is inherent to innovation and this is fully accepted by the European Commission — but how risk is managed can influence the success of S3. Before defining what is meant by success or failure, it is useful to distinguish between innovation activities of firms, and innovative measures of support providers, including public bodies. Business innovation has by definition a higher risk than non-innovative activities, but when successful is likely to render higher returns for investment, jobs and growth. This is why innovation is a core issue for the Europe2020 strategy. The use of innovative support measures also entails a certain level of risk, but likewise has the potential for achieving better results.

Both types of innovation should be accompanied by appropriate risk mitigation or management. For example, with regard to the possible failure of business innovation projects, the Commission recommends coherent policy-mixes, such as the combination of advisory services with networking and clustering, as well as direct financial support. The Commission also promotes the increased use of

financial instruments that enhance risk-sharing. As for mitigating the risk of failure of public support mechanisms, the Commission encourages experimentation. This can include pilot interventions that can subsequently be abandoned or modified; this approach applies not only to the innovative actions for sustainable urban development, but to all innovation-related investments.

To determine whether there is success or failure at the level of operations, it is of utmost importance to set meaningful indicators, for instance those that include a realistic time-perspective. In this example, employment growth due to business innovation may not materialise within the programming period, and to use this as an indicator may be counterproductive.

On the other hand, the development and testing of a prototype, new forms of co-operation along the value chain or increased collaboration with research institutes may materialise in time, and hence may be aptly used as indicators. The setting and quantification of indicators should also take into account the level of risk and innovativeness of the measures to be supported by the proposed investment.

6. Including actions or policies not linked to EU funds in a S3

This will be even necessary in most cases. For instance, the regulatory and administrative environment, including the financing of universities, fiscal incentives and R&I support structures, not to mention the overall governance arrangements, may be crucial to the success of S3. However, these complementary measures and governance structures will depend on the particular policy and institutional context of each Member State.

7. Appropriate administrative/geographical level for national or regional S3

The answer to this question depends on each Member State's institutional and territorial architecture, as well as on the administrative level responsible for the competences on R&D and innovation. It is up to the Member States to decide what suits them best, in light of their governance structures. As far as national S3 are concerned, it is worth recalling that if a country plans to have a national S3, this is supposed to be the national research and innovation strategy and not a separate/parallel plan in addition to the national R&I strategy.

If a country opts for a national S3 in addition to regional strategies, national and regional S3 have to be coherent and complementary. This will call for a consolidation of strategies and there will certainly be a need for governance structures for monitoring the implementation at both levels. The Commission's remit here corresponds specifically to exploring issues related to the quality and effectiveness of the parts implemented by the OPs. It is strongly recommended that authorities at the most relevant territorial level (NUTS I, II or III) with respect to the decision-making process of

both drafting innovation strategies and managing EU Structural Funds register as members of the S3 Platform. Any specific queries on this subject can be addressed to the S3 Platform's mailbox: jrc-ipts-s3platform@ec.europa.eu.

8. The role of science and business parks in S3

The RIS3 Guide highlights the important role to be played by all innovation actors in the S3 process. Science, technology and business parks are essential stakeholders to be included in the S3 governance framework, and their input for the prioritisation stage should be considered a key element in the process.

In addition, these parks contribute to other dimensions of the smart specialisation paradigm: their management bodies have experience in stimulating and managing flows of knowledge and information between companies, universities, entrepreneurs and technicians, and provide an environment that enhances a culture of innovation, creativity and quality. They facilitate the creation of new businesses via incubation and spin-off mechanisms, and accelerate the growth of small and medium size companies, and work in a global network that gathers many thousands of innovative companies and research institutions throughout the world, facilitating the internationalisation of their resident companies.

In addition, companies are located in parks are specialized in very specific activities of several different sectors. This is why so many times, when these companies collaborate with others, appear new products, services or technologies produced through the combination of different activities and different sectors. This process of cross-fertilization of activities and sectors (related diversity) is also one of the activities on the daily agenda of the managing bodies of the parks and they can provide many examples of how they develop.

9. Implementing S3: the need for information on the policy mix

A S3 needs to outline the policy mix (EU funded and other) that will be used for its implementation; mere political visions and objectives are not enough. The outlined measures should in particular be fit to stimulate private research and innovation investment, i.e. it is recommended to involve entrepreneurs in the design of individual support tools and in the concept of the overall innovation support system (which should contain not only direct financial support to specific R&I projects, but also cooperation platforms, support services, infrastructures, etc.).

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Smart Specialisation Platform

Provides professional advice to EU countries and regions for the design and implementation of their Research and Innovation Strategies for Smart Specialisation (RIS3).

Its services include:

- Provide guidance material and good practice examples,
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- Facilitate peer-reviews and mutual learning,
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- Train policy-makers.

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